NATIONAL AGRICULTURE DEVELOPMENT PROGRAMME (NADP)

DISTRICT AGRICULTURE PLAN

KANCHEEPURAM

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

NATIONAL AGRICULTURE DEVELOPMENT PROGRAMME (NADP / RKVY)

NADP

DISTRICT AGRICULTURE PLAN

KANCHEEPURAM DISTRICT

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COIMBATORE - 641 003

2017

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The District Agriculture Plan aims at achieving and sustaining the desired annual growth by ensuring holistic development of agriculture and allied sectors such as agriculture, horticulture, water resources, agricultural engineering, agri-business, animal husbandry and fisheries. It has to be ensured that the local needs/crops/priorities are better reflected in the agricultural plans. The ultimate aim is to maximize returns to the farmers by carrying out various agriculture and allied sectors.

In order to make the development of agricultural and allied activities more inclusive and also to emphasize bottom up approach in the planning process, block level stakeholders' meetings were conducted by involving all the block level officials, agricultural scientists, farmers, peoples' representatives and so on. The interventions suggested in the block level meetings were incorporated in the District Agriculture Plan. For each block, one scientist from TNAU was nominated to gather the physical and financial aspects of the block level plan.

Kancheepuram district is situated on the northern East Coast of Tamil Nadu and is adjacent by Bay of Bengal and Chennai city and is bounded in the west by Vellore and Thiruvannamalai district, in the north by Thiruvallur district and Chennai district, in the south by Villuppuram district in the east by Bay of Bangal. It lies between 11° 00' to 12° 00' North latitudes and 77° 28' to 78° 50' East longitudes. The district has a total geographical area of 4432.10 Sq. Kms and coastline of 57 km. Kancheepuram, the temple town is the district headquarters. For administrative reasons, the district has been divided into 4 revenue divisions comprising of 12 taluks with 1137 revenue villages. For development reasons, it is divided into 13 development blocks with 633 Village Panchayats.The pre-monsoon rainfall is almost uniform throughout the district. The coastal taluks get more rains rather than the interior regions. This district is mainly depending on the seasonal rainfall, the distress conditions prevail in the event of the failure of rains. Northeast and Southwest monsoon are the major donors with 54% and 36% contribution each to the total annual rainfall. The normal rainfall of the district is 1213.3 mm. The Kancheepuram District Agriculture Plan for 2017-2022 period has been prepared and the salient features of the District Agriculture Plan are discussed below.

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Budget Requirement for Kancheepuram District

(₹. in lakhs)

Sl.No.	Sectors	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	1060.91	6615.81	5993.14	6125.69	5657.13	25452.64
2	Agricultural Research	0.00	0.00	0.00	0.00	0.00	0.00
3	Horticulture	783.86	784.53	947.20	994.65	1021.29	4531.53
4	Agricultural Engineering	3600.49	3169.41	3196.31	3162.01	3189.41	16317.63
5	Agricultural Marketing	178.25	367.75	417.51	118.25	279.75	1361.51
6	Seed Certification and Organic Certification	18.36	0.00	13.36	0.00	0.00	31.72
7	Animal Husbandry	3629.52	2743.03	2303.13	1762.03	1443.02	11880.72
8	Animal Sciences Research (TANUVAS)	316.50	175.00	316.50	150.00	200.00	1158.00
9	Dairy Development	514.75	2359.75	17196.75	981.00	1218.00	22270.25
10	Fisheries	355.82	498.56	141.74	146.74	155.59	998.45
11	Fisheries Research (TNFU)	218.73	1205.53	168.73	273.73	109.73	1976.45
12	Public Welfare Department (WRO)	4420.00	5300.00	6725.00	4760.00	4850.00	26055.00
13	Civil supplies & Cooperatives	317.16	219.50	204.61	208.20	223.77	1173.24
	Total	**15414.35**	**23438.87**	**37623.98**	**18682.30**	**18347.69**	**113207.14**

The total budget requirement for the implementation of various interventions by different departments in Kancheepuram district is **₹ 113207.14 Lakhs.**

CHAPTER I

INTRODUCTION

Agriculture sector plays a strategic role in the process of economic development of a country. It has already made a significant contribution to the economic prosperity of the country and its role in the economic development is of vital importance. The National Development Council (NDC), in its meeting held on 29th May, 2007 observed that a special Additional Central Assistance (ACA) Scheme is to be introduced to incentivize States to draw up Comprehensive Agriculture Development Plans (CADP) taking into account of the different agro-climatic conditions, natural resources and technology for ensuring more inclusive and integrated development of agriculture and allied sector.

In pursuance of the aforesaid observations and in consultation with the Planning Commission, the Department of Agriculture and Cooperation (DAC), Ministry of Agriculture, Govt. of India launched Rashtriya Krishi Vikas Yojana (RKVY) / National Agriculture Development Programme (NADP) during 2007-2008. Since then, the different states in India received grants for implementation of projects under NADP/RKVY based on project mode. The overall objectives of NADP/RKVY are as follows:

Objectives of RKVY

RKVY aims at achieving and sustaining desired annual growth by ensuring holistic development of agriculture and allied sectors.

To recapitulate, the main objectives of the scheme are:

- To incentivize the States so as to increase public investment in Agriculture and allied sectors.
- To provide flexibility and autonomy to States in the process of planning and executing Agriculture and allied sector schemes.
- To ensure the preparation of agriculture plans for the districts and the States based on agro-climatic conditions, availability of technology and natural resources.
- To ensure that the local needs/crops/priorities are better reflected in the agricultural plans of the States.
- To achieve the goal of reducing the yield gaps in important crops, through focused interventions.
- To maximize returns to the farmers in Agriculture and allied sectors.

- To bring about quantifiable changes in the production and productivity of various components of Agriculture and allied sectors by addressing them in a holistic manner.

Preparation of District and State Agriculture Plans

As per the recent guidelines issued by the Government of India, the new project proposals to be implemented under NADP must be in accordance with the basic documents namely District Agricultural Plans (DAP), State Agriculture Plans (SAP) and State Agriculture Infrastructure Development Programme (SAIDP). Thus, these plan documents will remain as cornerstone of planning and implementation of the NADP/RKVY and other schemes during the period coinciding with 14th Finance Commission period.

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

- The DAPs are integral to the District Development Plan.
- Each District will have a DAP after taking into consideration of resources that would be available from other ongoing schemes (both State and Central), like Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS), Swarnajayanti Gram Swarojgar Yojana (SGSY), Backward Regions Grant Fund (BRGF), Integrated Watershed Management Programme (IWMP), Accelerated Irrigation Benefit Programme (AIBP), Bharat Nirman, District/State Irrigation Plans (PMKSY) etc.
- The District Agriculture Plan shall not be the usual aggregation of the existing schemes but would aim at moving towards projecting the requirements for development of agriculture and allied sectors of the district. These plans will present the vision for agriculture and allied sectors within the overall development perspective of the district. DAP's would also present their financial requirements in addition to sources of financing the agriculture development plans in a comprehensive way. Since achievement of RKVY's objectives is sequel to proper District Planning, these requirements should be adhered to by the State as far as possible.
- The States will have to specify the institutional mechanisms evolved by them for District Planning and submit a status report at the stage of the Annual Plan exercise. DAP will also include animal husbandry and fishery development, minor irrigation

projects, rural development works, agricultural marketing schemes and schemes for water harvesting and conservation, etc. keeping in view of 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 programmes as well as the role assigned to the Panchyatai Raj Institutions (PRIs) are appropriately incorporated in DAPs. States may also engage consultants / consulting agencies to revise / update DAPs and SAPs.
- Thus, each State will also have a comprehensive State Agricultural Plan (SAP) for the plan period by integrating the District Plans. SAPs will invariably have to indicate resources that can flow from the State to the districts.

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 for 11th and 12th Plan periods (2012 - 2017). However, keeping in view of the changing scenario in the development and emerging needs of the State and also to be eligible for fresh grants from Government of India, these plans have to be revised and updated appropriately for implementing RKVY during the 14th Finance Commission period (2015 - 2020). The current exercise is the continuation of the 12th plan period which covers two years of the 14th Finance Commission period (2015-16 and 2016-17). The remaining period has to be covered under this current revision. Considering the normal practice of preparing a plan for five years, the present revision is attempted for covering the period form 2017-18 to 2021-22.

State Agriculture Infrastructure Development Programme (SAIDP)

Each State is to prepare SAIDP in similar manner to that of DAPs and SAPs for identifying shelf of projects for RKVY (Infrastructure and Assets) stream. SAIDP should ideally be the consolidation of requirement of infrastructure identified in DAPs and SAP.

State Planning Department would provide revised / updated SAP and SAIDP to Department of Agriculture (DAC) and Planning Commission as a part of State's annual State Plan exercise.

Methodology followed

The revision of the District Agricultural Plan, State Agricultural Plan and State Agriculture Infrastructure Development Programme.

The secondary data of district and block with respect to rainfall, land use pattern, demography, livestock, machinery, infrastructure created, constraints in production and marketing of agricultural and livestock produce, crop/animal production, gaps between expected and actual yield and reasons for such gaps were updated from various published sources.

In consultation with the various stakeholders and on-going development schemes, the line departments from respective districts furnished a detailed year-wise action plan i.e. from 2017-18 to 2021-22 for each block. These action plans proposed indicates the nature and type of interventions to be made, area of operation and their coverage, budget requirement etc. These block-wise action plans were further consolidated into district level plans which are discussed with stakeholders and finalized. Finally the district plans are integrated into state level plans (SAP and SAIDP).

CHAPTER II

PROFILE OF THE DISTRICT

2.1 Kancheepuram district at a glance

Kancheepuram district is situated on the northern east coast of Tamil Nadu and is bounded in the west by Vellore and Thiruvannamalai districts, in the north by Thiruvallur district and Chennai districts, in the south by Villuppuram district and in the east by Bay of Bengal. The district has been divided into 4 revenue divisions comprising of 12 Taluks with 1137 revenue villages. For development reasons, it is divided into 13 development blocks with 633 Village Panchayats. The details of Taluks and development blocks are given in Table.2.1.

2.2 Area, Location and Geographical features

It lies between 11° 00' to 12° 00’ North latitudes and 77° 28' to 78° 50' East longitudes. The district has a total geographical area of 4393.37 sq. km and coastal line of 57 km.

Table 2.1 Details of Taluks and Development blocks of Kancheepuram district

Taluk	Development block
Cheyyur	Chitamur, Lathur
Chengalpattu	Kattankulathur
Tiruporur	Tiruporur
Kancheepuram	Kancheepuram
Walajabad	Walajabad
Maduranthagam	Acharapakkam, Maduranthagam
Sri Perumbudur	Sri Perumbudur, Kunratur
St. Thomas Mount	St. Thomas Mount
Alandur	St. Thomas Mount
Sholinganallur	St. Thomas Mount
Uthiramerur	Uthiramerur
Thirukazhhukunram	Thirukazhhukunram

Source: G return Records, Assistant Director of Statistics, Directorate of Economics and Statistics, Kancheepuram.

2.3 Administrative Structure of Kancheepuram district

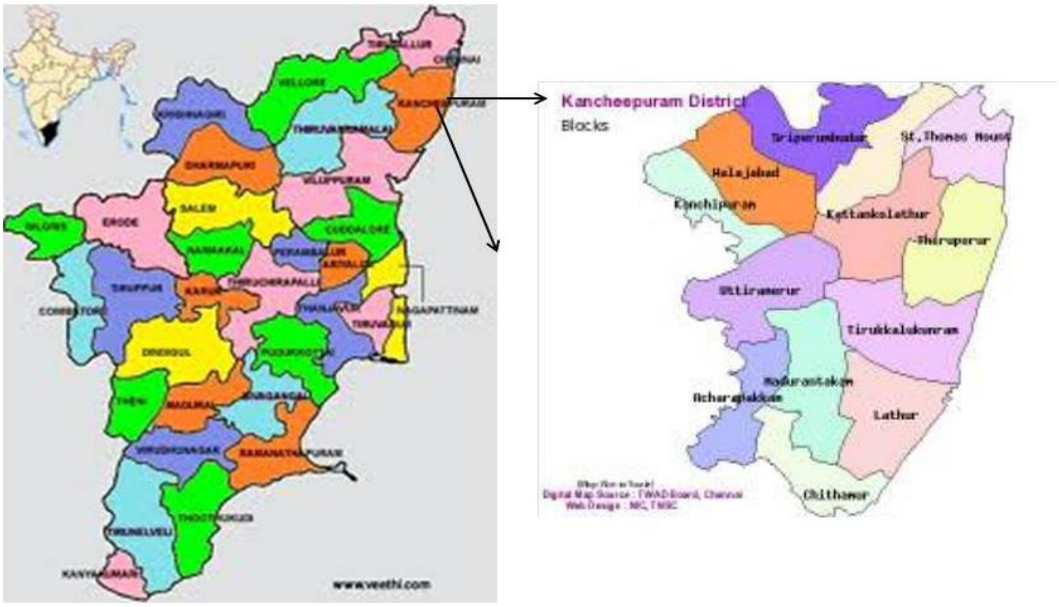


Fig.1 Location map of the Kancheepuram

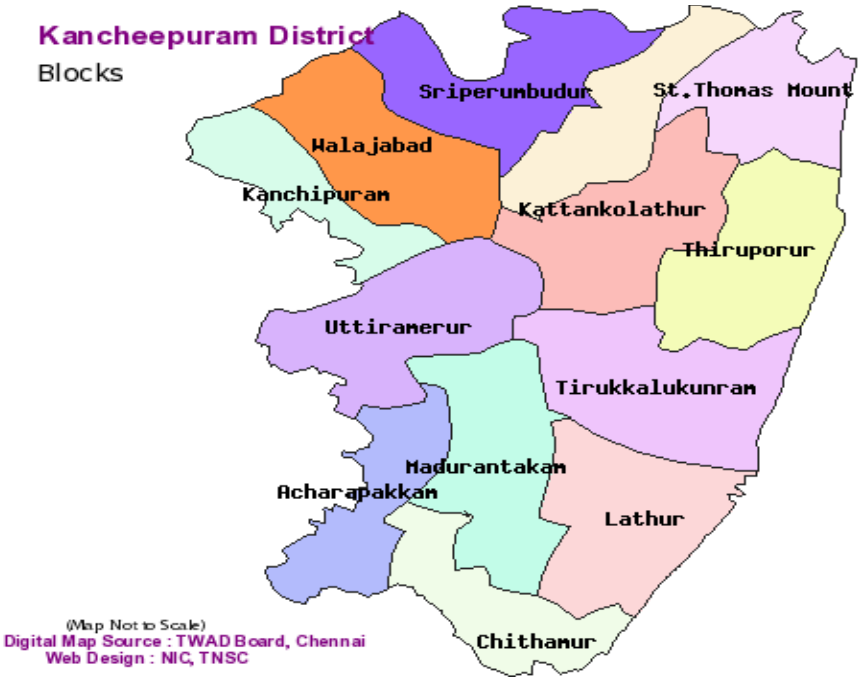


Fig.2 Blocks in Kancheepuram District

2.4 Demographic profile

The initial provisional data released by census India 2011 shows that density of Kancheepuram district for 2011 is 927 persons per sq. km and it was at 668 people per sq. km in 2001. Total population of Kancheepuram district is 39.90 lakhs of which male accounts for 50.4 per cent and female accounts for 49.6 per cent. It is interesting to note that both male and female are almost equal in the district.

Table.2.2. Population details of Kancheepuram district (Number)

Particulars	2011 Census	2001 Census
Population	39,90,897	28,77,468
Male	20,10,309	14,57,242
Female	19,80,588	14,20,226
Population Growth	38.69%	19.15%
Density / km^2	927	668
Proportion to Tamil Nadu Population	5.53%	4.61%
Sex Ratio (Per 1000)	985	975
Total Child Population (0-6 Age)	3,96,254	3,37,259
Male Population (0-6 Age)	2,01,499	1,71,997
Female Population (0-6 Age)	1,94,755	1,65,262
Average Literacy (%)	85.29	76.85
Male Literacy (%)	90.34	84.73
Female Literacy (%)	80.17	68.79

Source: District hand Book, Directorate of Economics and Statistics, Kancheepuram,2011.

2.5 Topography

Type of Terrain : Coastal areas and other plain lands with small intermittent hills

Elevation : Min.: 0.5 m Max.: 230 m above MSL

Hills : St. Thomas Mount Hills, Thirukazhhukunram and Vandalur Hills.

Rivers : Adyar, Palar and Cheyyar.

2.6 Soil type

Different soil types are prevalent in the district. The major soil in the district is deep black soil (19.0 %) followed by moderate deep black soil (14.1 %) and moderate deep red soil (12.9 %) and red soil (12.0 %) respectively.

Table.2.3. Soil classification of the Kancheepuram District

Soil Type	Area in '000 Ha	Percentage
Deep black soils	84.0	19.0
Moderate Deep black soils	62.4	14.1
Moderately deep red soils	57.1	12.9
Deep red soils	53.1	12.0
Very deep black soils	39.8	9.0
Shallow black soils	27.1	6.1

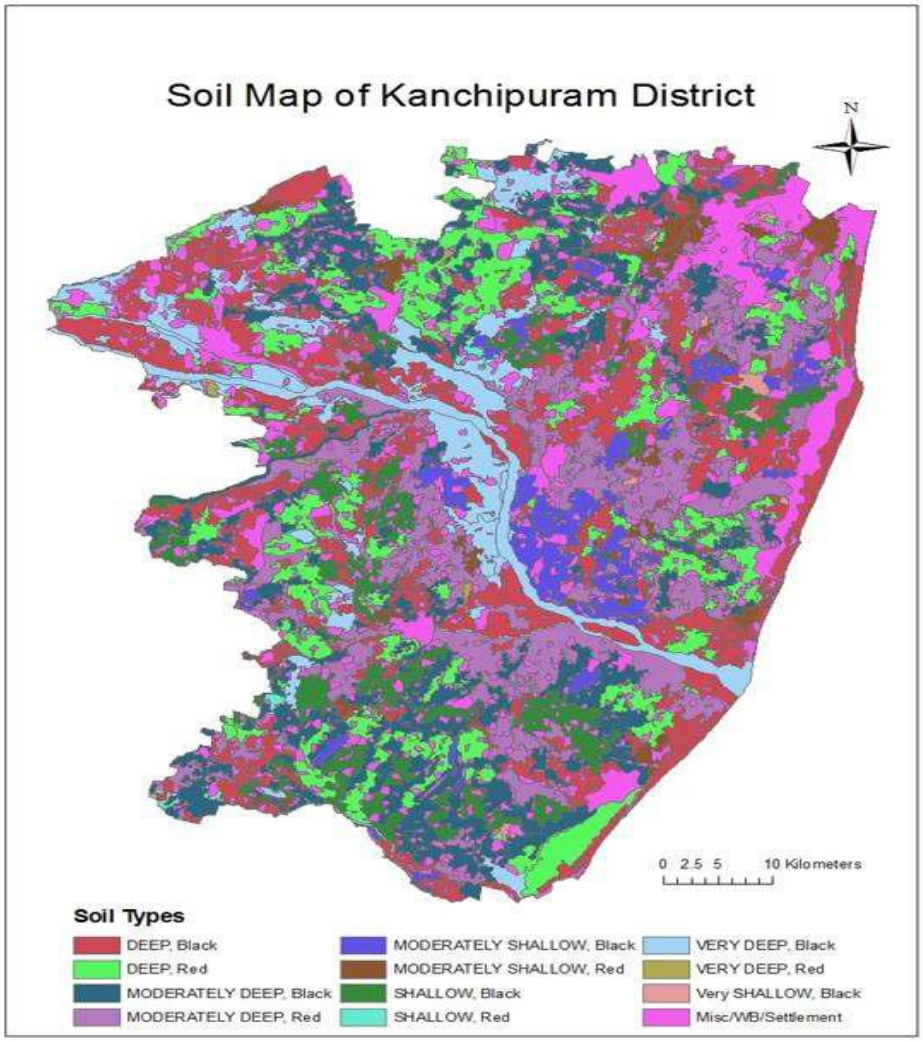


Fig. 3 Soil map of Kancheepuram District

2.7 Climate Condition and Rainfall

Rainfall is an important factor that influences agriculture. The agricultural production and productivity of crops mainly depends on the timely onset of South-West and North-East Monsoons and the quantity and distribution of rainfall. The district receives relatively higher quantum of rainfall during the North-East Monsoon. The district received an average annual rainfall of 1208 mm. The long term trend in rainfall indicates that North-East season contributes around 59.57 per cent, while the South-West Monsoon accounts for 33.25 per cent of the total rainfall. During the South-West Monsoon, the state received an average rainfall of 401.8 mm. The precipitation during North-East Monsoon was 719.9 mm rainfall.

Table 2.4 Season wise rainfall in Kancheepuram District (mm)

Year	South west	North-east	Winter	Summer	Annual total
2000-01	313.2	398.2	4.8	71.5	787.7
2001-02	317.8	602.4	66	20.8	819.8
2002-03	228.6	526.2	0.1	42.1	797
2003-04	683.3	410.6	14.2	246.0	1354.3
2004-05	417.0	451.0	0.5	169.0	1038.5
2005-06	293.5	1471	16.1	44.9	1825.5
2006-07	385.1	704	1.6	33.8	1055
2007-08	530.0	658	47.6	183.0	1419
2008-09	313.0	893.8	1.6	50.4	1219.2
2009-10	323.0	737.1	1.1	91.0	1156.8
2010-11	526.7	744.8	41.7	85.7	1398.9
Mean	401.8 (33.25)	719.9 (59.57)	19.05 (1.58)	96.67 (8.00)	1208.4 (100)
CV	33.56	41.96	121.80	75.47	26.42

**Figure in parentheses indicate percentage to total*

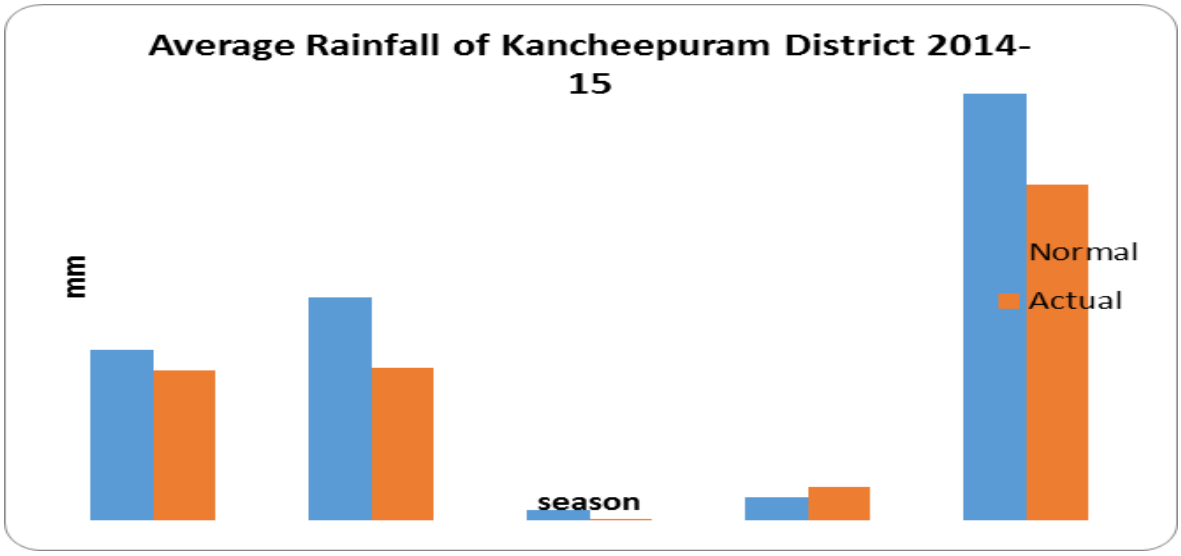
The long term analysis indicates that huge variations in rainfall are observed particularly during winter and summer. Even high variability in rainfall observed in crucial seasons such as North-East Monsoon (41.96 per cent) and South-West Monsoon (33.56 per cent).

Table 2.4a Month wise / season wise rainfall distribution in Kancheepuram District (Actual and Normal)

Season / Month	2014-2015	
	Actual	**Normal**
South West Monsoon		
June	117.60	68.40
July	50.90	109.50
August	130.90	164.10
September	130.60	148.80
Total	**430.00 (44.57)**	**490.80 (39.98)**
North East Monsoon		
October	196.30	225.80
November	135.00	283.00
December	106.90	133.00
Total	**438.20 (45.42)**	**641.80 (52.28)**
Winter Season		
January	1.70	17.30
February	0.00	11.80
Total	**1.70 (0.18)**	**29.10 (2.37)**
Hot Weather		
March	0.00	3.30
April	49.50	16.40
May	45.40	46.30
Total	**94.90 (9.84)**	**66.00 (5.38)**
Annual rainfall	**964.80 (100.00)**	**1227.70 (100.00)**

Source: Season and Crop Report (2014-15), Department of Economics and Statistics, Tamil Nadu. Figures in parenthesis denote percentage to total annual rainfall

Fig. 4. Season Wise Average Rainfall (2014-2015)



2.8 Land

The land use pattern of the Kancheepuram district is furnished in the Table 2.5. The total geographical area of the district is 4,43,210 ha. The area under forest during the period from 1996-97 to 2014-15 remains unchanged and it accounted for 5.38 per cent of total geographical area. The extent of barren and uncultivable land in the district slightly decreased from 11054 to 10948 during the period from 1996-97 to 2014-15. The land put under non-agricultural uses consistently increased from 139372 ha to 151650 ha during the period from 1996-97 to 2014-15. It was estimated that 7977 ha of land brought under non-agricultural uses during the past 15 years. It may due to increased urbanization and industrialization as it has close proximately to the state capital. The extent of cultivable waste, permanent pasture and land under miscellaneous tree crops and groves category together accounted for 9.1 per cent to the total geographical area.

Area under current fallow and other fallow put together increased during the period from 1996-97 to 2014-15. The share of both category increases 14.1 per cent to 22.5 per cent. This may be due to inadequate and erratic rainfall and lack of capital to venture in farming. The share of net cultivated area in 1996-97 was 37.33 per cent and declined to 25.02 per cent. The reason for decline in cultivated area may be due to conversion of land to non-agricultural uses like housing, industries and others. It is feared that due to urbanization the area under cultivation would tend to decrease over the years. With almost little scope for

increasing area under crops, there is a dire need for increasing productivity through intensive cultivation.

Table 2.5 Land Use Pattern of Kancheepuram District 2014-2015

S.No.	Particulars	Area (ha)	per cent
1	Geographical Area	443210	100.00
2	Forest	23856	5.38
3	Barren & Uncultivable Area	10948	2.47
4	Land Put to Non-agricultural Uses	151650	34.22
5	Permanent Pastures & Other grazing lands	18286	4.13
6	Misc. tree crops & groves not incl. in the net area sown	11745	2.65
7	Current Fallow	56341	12.71
8	Other Fallow	73626	16.61
9	Net area sown	85281	19.24
10	Area sown more than once	11249	2.54
11	Gross area sown	96530	21.78

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

2.9 Land Holding Pattern

Tamil Nadu agriculture has undergone significant changes. Over a period of time, the average size of holdings across size groups shows significant changes. The area operated by different holdings imply that the area operated by the resource poor marginal farmers at 22.92 lakh ha and small farmers at 16.44 lakh ha during 2010-11 still continued to dominate the Tamil Nadu agriculture as these are higher than the area operated by medium, and large farmers.

The State level data presented in Table.2.6 shows that the number of marginal, small, medium and semi-medium holdings increased over the years and so also the area operated by these categories of farmers. In 2010-11, the marginal and small farmers accounted for 91.75 per cent of total number of holdings however they operated only 60.67 per cent of the area. The other categories of farmers *viz.,* semi medium, medium and large holdings declined significantly over the years and clearly there is a shift from large categories of holdings to

marginal and small holdings. However, the changes in average size of holdings under these categories revealed a peculiar pattern of marginal holdings getting further marginalized and the large farms experiencing some amount of consolidation.

Table 2.6. Land holding pattern in Tamil Nadu

Number : '000 numbers

Area : '000 hectares

Category	1985-86		1995-96		2000-01		2010-11	
	No.	Area	No.	Area	No.	Area	No.	Area
Marginal (<1.0ha)	5497	2017 (0.36)	5951	2210 (0.37)	5846	2159 (0.36)	6266	2292 (0.37)
Small (1.0-2.0 ha)	1260	1771 (1.41)	1233	1721 (1.39)	1226	1712 (1.39)	1182	1644 (1.39)
Semi-medium (2.0-4.0 ha)	648	1778 (2.74)	600	1622 (2.70)	571	1551 (2.71)	502	1355 (2.70)
Medium (4.0-10.0 ha)	260	1507 (5.79)	199	1134 (5.69)	193	1094 (5.66)	151	847 (5.63)
Large (> 10.0 ha)	39	720 (18.46)	26	613 (23.57)	23	456 (19.78)	17	350 (20.13)
Total	7706	7795 (1.01)	8011	7303 (0.91)	7859	6972 (0.88)	8118	6488 (0.80)

Source: Department of Evaluation and Applied Research, Tamil Nadu An Economic Appraisal Different issues, Department of Evaluation and Applied Research, Chennai.

The analysis would however, conclusively show that continued marginalization of majority of holdings and increasing number of marginal and small holdings would only make farming increasingly strenuous with changing climatic conditions necessitating some innovative approaches such as cluster approach, promoting contract farming, credit and insurance coverage to make farming viable and farmers empowered to survive in the changing scenario to cut transaction cost and minimize expenses through joint initiatives to ensure remunerative farming.

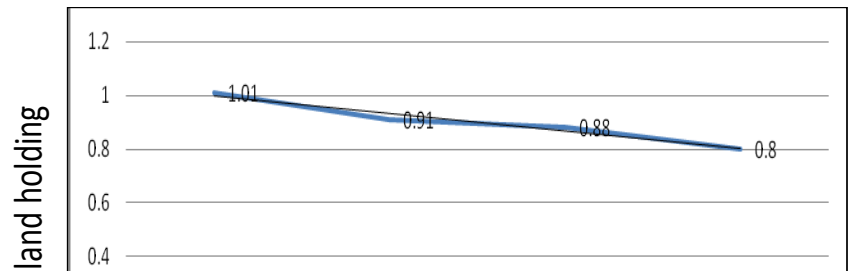


Fig. 5 Trend in Average Size of Holdings in Tamil Nadu (ha)

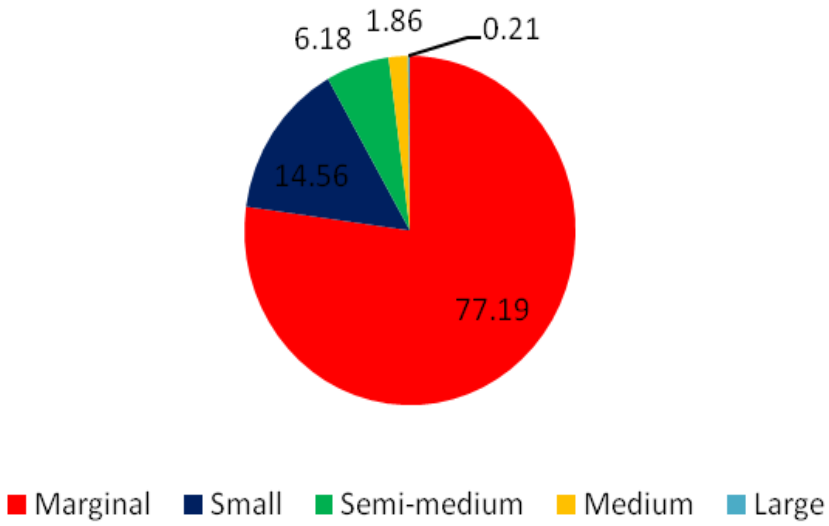


Fig. 6 Category wise Percentage of Farmers in Tamil Nadu during 2010-11

2.10 Cropping Pattern

Table 2.7Area, production and productivity under major crops (2014-15)

Sl.No	Particulars	Area (in ha)	Production (in tonnes)	Productivity (in kg/ha)
1	Paddy	75076.33	342205.33	4566.00
2	Maize	13.00	76.67	3684.67
3	Cholam	22.67	45.67	1642.00
4	Cumbu	42.00	90.67	2257.33
5	Ragi	244.33	893.33	3080.33
6	Bengal Gram	9.00	5.00	334.67
7	Red Gram	143.00	161.67	1003.33
8	Black Gram	1262.00	1051.67	743.00
9	Green Gram	402.00	236.00	558.00
10	Horse Gram	7.33	4.67	594.67
11	Groundnut	13140.67	48067.00	2472.00
12	Sunflower	5.67	8.33	1009.33
13	Gingelly	1529.33	991.67	437.67
14	Cotton	2.67	8.33	340.00
15	Coconut	3140.67	241.33	5558.00
16	Sugarcane	1786.00	183436.33	70.33
17	Tobacco	1.00	2.00	558.67
18	Onion	1.00	8.67	2844.33
19	Brinjal	186.67	1679.00	9034.00
20	Bhendi	196.33	1325.67	6976.33
21	Tomato	2.33	32.67	13678.67
22	Banana	220.00	8709.33	39706.00
23	Mango	3343.67	18597.33	5581.00
24	Jack Fruit	48.33	624.33	12870.67
25	Pine Apple	2.33	65.67	18489.33
26	Guava	240.33	1444.67	6151.67
27	Grapes	0.33	4.33	4482.67
28	Chillies	116.67	50.67	438.33
29	Tamarind	29.00	116.00	4015.33
30	Tapioca	95.33	3036.00	32180.00
31	Sweet Potato	4.00	76.33	12898.33
	Total	**101314.00**	**613296.33**	**198256.67**

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

2.11 Sources of Irrigation

Improved adoption of crop production technologies are the main driver of agriculture growth as it determines the level of production. The green revolution technology has helped in raising the productivity and production of important crops across regions. The impact of technological developments was much stronger in irrigated crops. No doubt, the use of high yielding variety seeds, irrigation and chemical fertilizers tilted the agricultural production scenario of India.

Irrigation water is a crucial input being used in crop production, which enables the use of other complementary inputs such as fertilizers and manures. Experiences show that access to irrigation has significant bearing on the productivity and revenue from crop production. It is evidenced that on an average an irrigated farmer in India obtained about Rs.14, 000 per hectare of cultivated area whereas the average rainfed farmer obtained about Rs.6, 000 per hectare (in constant price of 1992-93). Surface irrigated crop land in India is Rs.1, 237/ha in 1992-93 (in constant price of 1992-93) which is higher than the crop area without access to irrigation keeping other inputs constant. Thus, the irrigation determines the level of productivity, production and hence the farm profitability in any region. In this context, the area irrigated under important crops across regions is crucial to be examined. The source wise area irrigated in Kancheepuram district is presented in Table 2.8.

Table 2.8 Area Irrigated by Different Sources of Water Supply and Growth Rates

Area irrigated	Net Area Irrigated	Gross Area Irrigated
Canals	-7.02	-8.64
Tanks	-1.04	-2.16
Tube wells	-1.25	-3.20
Ordinary wells	-2.67	-4.73
Other sources	-14.68	-15.44
Total	**-1.64**	**-3.37**

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

Table 2.9 Irrigation by Different Sources in Kancheepuram District during 2014-15

Sl.No.	Particulars		2012-13	2013-14	2014-15	Average
1	Canals	Gross	183	230	200	204.33
		Net	183	230	200	204.33
2	Tanks	Gross	56938	60941	40011	52630.00
		Net	51892	49172	34688	45250.67
3	Tube wells / Bore wells	Gross	9830	13155	9568	10851.00
		Net	9110	10689	7942	9247.00
4	Open wells	Gross	38776	38162	37209	38049.00
		Net	36735	34641	33783	35053.00
5	Supplementary wells	Gross	406	58	0	154.67
		Net	341	33	0	124.67

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

Table 2.10 Consumption of Chemical Fertilizers and Pesticides during 2014-15

Fertilisers (in Tonnes)				Pesticides	
Nitrogenous (N)	**Phosphate (P_2O_5)**	**Potassic (K_2O)**	**Total (NPK)**	**Dust (Mt)**	**Liquid (000,Lit.)**
33638	5980	6220	45838	89	28

Source: Joint Director of Agriculture, Kancheepuram.

Table 2.11 Agricultural Machineries and Implements (in Nos.) (2014-15)

Sl.No.	Item	In Nos.
1.	**Ploughs**	
	Wooden	69507
	Iron	47414
	Others	24509
	Cart	15585
	Total	157015
2.	**Water Pumps for Irrigation Purpose**	
	Worked by Oil Engine	12660
	Worked by Electric Power	31535
	Total	44195
3.	**Tractors**	
	Government	
	Private	1899
	Total	1899
4.	**Sugarcane Crushers**	
	Worked by Power	67
	Worked by Bullocks	
	Total	67
5.	**Oil Ghanis**	
	5 kg and above	
	Less than 5 kg	42
	Total	42

2.12 Regulated Markets

The institutional factors such as government expenditure on agricultural development, flow of institutional credit, market and input delivery systems and other supports will have direct bearing on the agricultural production in any region. The details of such market infrastructure are presented here.

Table 2.12 Regulated Markets of Kancheepuram District

Particulars	Numbers
Agricultural produce sales centres	
Regulated markets	7
Village Markets	9

2.13 Storage Facilities

The Storage Facilities available in the Kancheepuram District are presented in the Table. 2.13.

Table 2.13 Storage Facilities available in Kancheepuram District

Particulars	Numbers
Storage Facilities	
Tamil Nadu civil supply corporation godowns	7
Government Seed Processing centres	2 – Medium 6 – Small
Private Seed Processing centres (700 tonnes)	3
Regulated market godowns (1000 tonnes)	4

2.14 Livestock population

The Livestock population available in the Kancheepuram District are presented in the Table. 2.14.

Table 2.14 Livestock population in Kancheepuram District

S. No.	Particulars	Population
1	Cattle	347372
2	Buffaloes	57457
3	Sheep	119646
4	Goats	192242

5	Horses and ponies	52
6	Donkeys	360
7	Camels	0
8	Pigs	2509
	Total Livestock	**719638**
9	Elephants	1
10	Dogs	59913
11	Rabbits	3028
	Poultry	
12	Bank yard Poultry	323220
13	Farm Poultry	484998
	Total Poultry	**808218**

2.15 Banking and Insurance

Table 2.15 Banking Sector available in Kancheepuram District

Particulars	Numbers
Credit institutions	
Nationalised banks	161
Private banks	36
Co-operative banks	29
PACBs	160
Primary Co-operative stores	9
Co-operative Marketing Societies	2

CHAPTER III

DEVELOPMENT OF AGRICULTURAL AND ALLIED SECTOR

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 (2015-16)

II. Yield gap analysis for the major crops

3.1 Trends in area, production and productivity of major crops

Compound Growth Rate of area under major crops grown in Kancheepuram district are presented in Table 3.1. The past trends in area, production and productivity of major crops need to be analyzed to plan for future agricultural development. Compound Growth Rate (CGR) tool is used to measure the annual rate of growth in area, production and productivity of major crops cultivated in the district and it is expressed in percentage. The compound growth rate has been estimated using 20 year time series data from 1996-97 to 2014-15 due to availability data for Kancheepuram district only from 1996-97 onwards.

Table 3.1 Area under Major Crops in Kancheepuram District (Triennium Average)

Sl.No	Crop	Area	Percentage	Production	Yield (kg/ha)
1	Paddy	75076	77.63	342205	4566
2	Sugarcane	1787	1.85	183436	103
3	Banana	220	0.23	8709	39706
4	Mango	3344	3.46	18597	5581
5	Groundnut	13141	13.59	48067	3665
6	Coconut	3141	3.25	N.A	N.A
	Total	**96708**	**100.00**		

N.A denotes Not Available

The Compound growth rates are shown in Table 3.2

Table 3.2 Compound Growth Rate of Area, Production and Productivity under major crops in Kancheepuram District during 2014-2015 (% per year)

		CGR during 2005-2006 to 2014-2015 (%)		
Sl.No	**Crops**	**Area**	**Production**	**Yield**
1	Paddy	4.05	5.19	2.29
2	Sugarcane	1.90	4.65	0.95
3	Banana	1.20	2.76	3.58
4	Mango	2.17	2.95	2.20
5	Groundnut	2.96	3.79	2.24
6	Coconut	2.17	N.A	N.A

N.A denotes Not Available

3.2 Projection on area, production and yield

The projections on area, production and yield were made for the potential crops identified in Kancheepuram district. It is evident that the unfavourable negative growth observed in rice area may lead to dramatic decline in rice area. It is projected that the rice area would be 50846.58 hectares if the current growth rate continues. Hence, there is a dire need for increasing the area under rice in the district. Though the rice area has registered a significant negative growth rate, the yield has registered a positive growth rate of 1.2 per cent which could at least compensate the reduction in production.

Table 3.3 Projected Area, Production and Yield for the Major Potential Crops Identified

Description	Paddy			Groundnut			Coconut		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Compound Growth Rate (%)	-2.953	-0.267	2.766	-5.091	-0.975	4.337	-3.035	-3.237*	1.137*
Triennium Average ending	92393	368491	3990	16703	69496	4160	3344	327	9808
2012-13	84312	344543	4086	16004	69120	4319	3141	322	10800
2013-14	81822	343623	4199	15189	68446	4506	3046	311	10923
2014-15	79406	342705	4316	14416	67779	4702	2953	301	11047
2015-16	77062	341789	4435	13682	67118	4905	2864	291	11173

Description	Sugarcane			Banana			Mango		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Compound Growth Rate (%)	-16.079	-15.769	0.466	1.984	3.791	1.772	3.747	5.048	1.254
Triennium Average ending	1161	133593	114	273	11968	43797	3292	13534	4073
2012-13	1055	112919	108	312	15036	48251	3468	14785	4264
2013-14	885	95112	108	318	15606	49106	3598	15532	4317
2014-15	743	80113	109	324	16198	49976	3732	16316	4371
2015-16	624	67480	109	331	16812	50861	3872	17139	4426

Area in Hectares; Production in Tonnes; Yield in Kg/ha (*Denotes growth rates from 2012 to 2016)

The second major crop is groundnut in the district. Interestingly, the yield of groundnut has registered a high positive CGR. Though the area under groundnut has registered a negative growth rate of -5.091 per cent, the positive CGR in yield offset the big negative effect, thus leading to a positive growth of groundnut production.

The mango has attracted the farmers of Kancheepuram recently. The mango has registered a compound growth rate of 3.747 per cent during 2022-23. Being a perennial tree crop which requires less water and labour, this assumes important now a days.

The projected area for sugarcane is worked out to be 699.22 hectares whereas the projected yield would be 125 tonnes per hectare.

3.3 Yield gap analysis

The Yield gap I and II for major crops such as rice, ground nut and sugarcane was worked out. The results indicate that in general the yield gap in rice varies across varieties. The yield gap II which is mainly due to various technical and socio-economic constraints, ranged from 137 kg/ha in improved Ponni to 500 kg/ha in CO R 51. This gap could be minimized by encouraging farmers to adopt the recommended technologies in time.

The yield gap for groundnut is worked out to 1011 kg/ha for the variety VRI 2/K6 and 2657 kg/ha for TMV 7. The yield gap is little higher in groundnut. This is mainly due to differences in resource endowments and application of technologies. Hence, proper adoption of various improved management practices and advanced agricultural production technologies, the yield gap could be minimized to a greater extent.

The major sugarcane variety being cultivated in Kancheepuram district is COSI94054. The progressive farmers' yield is worked out to 112 tonnes/ha whereas the farmers average yield is 103 tonnes/ha leading to a yield gap of 9 tonnes per hectare. Though the yield gap is small, this could be minimized by adopting proper technologies in time.

Table 3.4 Yield gap analysis of major crops in Kancheepuram district

Crop	Variety	Potential Yield (in kg/ha)	Progressive Yield (in kg/ha)	Variety Average Yield (in kg/ha)	Yield Gap I (in kg/ha)	Yield GAP II (in kg/ha)
Paddy	NLR	5000	5230	4800	-220	430
	ADT 37	6200	5349	4490	851	859
	CO R 51	6623	6700	5200	-77	500
	ADT 43	5900	6509	4525	-609	1984
	ADT 45	5400	6034	4695	-634	1339
	Improved White Ponni	6500	4447	4310	2053	137
Groundnut	TMV 7	2400	4182	1525	-1782	2657
	VRI 2 / K6	2060	2536	1525	-476	1011
Sugarcane (ton/ha)	COSI94054	128	112	103	16	9

3.4 Projected yield and production of selected of crops

3.4.1 Rice

Rice is a major crop in Kancheepuram district. Being a major crop, increasing productivity and production assumes important. Efforts have been made to project the yield and production of rice in 2022-23. It is estimated that the projected yield is 4167 kgs/ha. In order to achieve the projected yield of 4167 kgs/ha, it is essential to increase the yield at the growth rate of at least one per cent per annum. However, the projected production requires a higher growth rate of 8.87. It is mainly because of declining growth of area under rice. Urbanization, growing demands on land for non-agricultural purposes, agricultural production problems like labour scarcity are the major factors responsible for reduction in rice area.

Table 3.5 Projected Yield and Production of rice from 2011-12 to 2022-23

Year	Projected yield (Kg/ha)	Projected production (tonnes)
TE Yield 2010-11	3738.55	34478.5
2011-12	3774.29	348131.3
2012-13	3810.02	351427.5
2013-14	3845.76	354723.7
2014-15	3881.49	358019.9
2015-16	3917.23	361316.1
2016-17	3952.97	364612.3
2017-18	3988.70	367908.5
2018-19	4024.44	371204.7
2019-20	4060.17	374500.9
2020-21	4095.91	377797
2021-22	4131.64	381093.2
2022-23	4167.38	384389.4
Required growth	0.91	8.87

3.4.2 Groundnut

Groundnut is the second major crop in Kancheepuram district. Groundnut is being cultivated both under irrigated and rainfed conditions. The projected yield of groundnut is 7703 kg/ha. In order to achieve the projected yield, the yield of groundnut is required to increase at the growth rate of 5.37 per cent. Similarly, the required growth of production is 5.39 per cent per annum. Achieving such a higher growth rate in production and productivity could be achieved only by introduction and promotion of improved varieties and adoption of improved management practices.

Table 3.6 Projected Yield and Production of groundnut from 2011-12 to 2022-23

Year	Projected yield (Kg/ha)	Projected production (tonnes)
TE Yield 2010-11	4080.4	302590.2
2011-12	4382.3	324979.7
2012-13	4684.2	347369.9
2013-14	4986.1	369759.4
2014-15	5288.1	392149.6
2015-16	5590.0	414539.1
2016-17	5891.9	436928.6
2017-18	6193.8	459318.8
2018-19	6495.7	481708.3
2019-20	6797.7	504098.5
2020-21	7099.6	526488
2021-22	7401.5	548877.5
2022-23	7703.4	571267.7
Required growth	5.37	5.39

3.4.3 Sugarcane

The projected yield in the case of sugarcane is estimated at 125.7 tonnes during 2022-23. In order to achieve the projected yield it required to increase the yield at the growth rate of 1.68 per cent per annum. The production is required to grow at the rate of 1.70 per cent per annum.

Table 3.7 Projected Increase in Yield and Production of sugarcane from 2011-12 to 2022-23

Year	Projected yield (Kg/ha)	Projected production (tonnes)
TE Yield 2010-11	103.0	224128.0
2011-12	104.8	228258.8
2012-13	106.7	232389.5
2013-14	108.6	236520.3
2014-15	110.5	240651.1
2015-16	112.4	244781.9
2016-17	114.3	248912.6
2017-18	116.2	253043.4
2018-19	118.1	257174.2
2019-20	120.0	261305.0
2020-21	121.9	265435.7
2021-22	123.8	269566.5
2022-23	125.7	273697.3
Required growth	1.68	1.70

Adoption of improved management practices including drip and fertigation, the production and productivity of sugarcane could be increased significantly.

By and large, technological intervention by way of adoption of improved management practices, modern varieties would help in a big way to achieve the developmental objective of doubling production in 2022-23.

CHAPTER IV

DISTRICT PLAN

The interventions proposed, the associated outlays, the physical targets, budgetary requirements, time frame for achievements in the Agriculture, Agricultural Research, Horticulture, Agricultural Engineering, Agricultural Marketing, Seed Certification, Animal Husbandry, Animal Science Research, Dairy Development, Fisheries, Fisheries Research, Water Resource Organisation in PWD and Cooperation and Civil Supplies sectors are discussed in this chapter. This would comprehend the activities and the achievements to be made in beyond twelfth plan period.

4.1. Agriculture

The development of agriculture sector has been aimed at by mainly pushing up the productivity levels of the major crops *viz.,* Rice, Millets, Pulses, Oilseed, Oil palm, Sugarcane, Coconut and others components like infrastructure development, rainfed area development, integrated pest management, farm mechanization, soil health management & land development works in SSF and development of agricultural information technology in the district. Activities planned for and the costs involved for implementation under each crop are detailed below.

4.1.1. Enhancing the rice productivity

Kancheepuram district is situated on the northern East Coast of Tamil Nadu and is adjacent by Bay of Bengal and Chennai city and is bounded in the west by Vellore and Thiruvannamalai district, in the north by Thiruvallur district and Chennai district, in the south by Villupuram district in the east by Bay of Bengal. Agriculture is the major occupation of the people with 47 per cent of the population engaged in it. Paddy is one of the major crop cultivated in this district. Palar River along with Tanks and wells are the main sources of irrigation in this district. The average productivity of paddy in the district is about 4000 kg/ha. There is still scope for increasing the productivity by the adoption of advanced technologies and the proposed interventions will aimed to increase the productivity by 20 per cent.

Project components

- Promotion of SRI in all the blocks
- Distribution of MN mixture, biofertilizer, zinc sulphate, herbicides and portraysin all the blocks

- Distribution of certified seeds and Polyvinyl coated tarpaulin in all the blocks
- Certified seed production and incentives for paddy machine plantingin all the blocks

Budget

The budget requirement for fulfilling the various interventions is ₹ 6051.33 Lakhs.

Expected outcome

Supply of quality seeds of certified varieties will certainly increase the production and productivity. Reduction in cost of cultivation of crops due to supply of fertilizers and plant protection chemicals at a cost lower than market price. Assured supply of fertilizers and plant protection chemicals even in the condition of shortage of supply in market.

Implementing agency

The projects will be implemented by the Department of Agriculture. The progress of the work will be monitored by Director of Agriculture at state level and Joint Director of Agriculture at district level.

Table 4.1. Budget Requirement for Paddy

(₹. in lakhs)

Sl. No	Interventions	Unit	Unit Cost (in Rs.)	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 Blocks	0	0.00	1700	255.00	1800	270.00	1660	249.00	1585	237.75	6745	1011.75
2	Distribution of High Yielding Varieties	MT	0.35	All Blocks	985	344.75	1250	437.50	1215	425.25	1230	430.50	1115	390.25	5795	2028.25
3	seed production - Certified class	MT	0.26	All Blocks	670	174.20	1765	458.90	1590	413.40	1620	421.20	1225	318.50	6870	1786.20
4	Incentives for paddy machine planting	Ha	0.1	All Blocks	0	0.00	1250	125.00	1250	125.00	1250	125.00	1250	125.00	5000	500.00
5	Distribution of MN mixture/ Copper Sulphate	Ha	0.01	All Blocks	0	0.00	2480	24.80	2480	24.80	2480	24.80	2480	24.80	9920	99.20
6	Distribution of biofertilizer / PPFM / bioinputs / plant nutrient mobilizing bacteria	Ha	0.003	All Blocks	3510	10.53	3170	9.51	3200	9.60	3200	9.60	3200	9.60	16280	48.84
7	Distribution of Zinc sulphate (Soil application & foliar)	Ha	0.01	All Blocks	2950	29.50	3160	31.60	3160	31.60	3160	31.60	3160	31.60	15590	155.90
8	Distribution of biocontrol agents/biopesticides	Ha	0.01	All Blocks	1150	11.50	3200	32.00	3200	32.00	3200	32.00	3200	32.00	13950	139.50
9	Gypsum application	Ha	0.015	All Blocks	250	3.75	1189	17.84	1193	17.90	1197	17.96	1201	18.02	5030	75.45
10	Distribution of herbicides	Ha	0.01	All Blocks	1200	12.00	1305	13.05	1310	13.10	1315	13.15	1320	13.20	6450	64.50
11	Polyvinyl coated Tarpaulin (6m x 5m)	No	0.02	All Blocks	180	3.60	467	9.34	475	9.50	480	9.60	485	9.70	2087	41.74
12	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					**609.83**		**1434.54**		**1392.15**		**1384.41**		**1230.42**		**6051.33**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5,Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.2. Enhancing the millets productivity

Declining trends in area and production of major and minor millets are observed in the recent years. On the other hand, the nutritive value of these millets are well recognized by the consumers, particularly at the mid and high income brackets in the recent times. The aim must be to grow millets especially minor ones under larger area including sub-marginal lands, so as to meet the growing demand. The strategies are by utilizing the sub-marginal and relatively waste lands and by adoption of latest production technologies, the production of millets (major and minor) would be increased.

Project components

- Seed production and distribution in all blocks except Chitlapakkam block
- Distribution of biofertilizers Liquid / Carrier in all blocks

Budget

The total cost of the project for five years works to ₹ 598.56 Lakhs.

Expected outcome

There is a scope to increase the area under millets in Kancheepuram district. By distributing improved varieties / hybrids of millets will certainly improve the living standard of the farmers of this tract. Supply of quality seeds of newly released varieties will certainly increase the production and productivity.

Implementing agency

The projects will be implemented by the Department of Agriculture. The progress of the work will be monitored by Director of Agriculture at state level and Joint Director of Agriculture at district level

Table 4.2. Budget Requirement for Millets production

(₹. in lakhs)

Sl. No.	Components	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Millets															
1	Seed Production / Incentives for quality seed	MT	0.63	All Blocks Except B3	21	13.23	90	56.70	108	68.04	115	72.45	95	59.85	429	270.27
	Ragi															
2	Distribution of bio - fertilizers Liquid / Carrier	Ha	0.003	All Blocks	750	2.25	1650	4.95	1650	4.95	1650	4.95	1650	4.95	7350	22.05
3	Seed distribution	MT	0.66	All Blocks Except B3	20	13.20	99	65.34	115	75.90	115	75.90	115	75.90	464	306.24
	Total					**28.68**		**126.99**		**148.89**		**153.30**		**140.70**		**598.56**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5, Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.3. Enhancing the pulses productivity

Pulses are one of the major crops of Kancheepuram district. In recent and past experience whenever receiving good amount of rainfall the farmers are willing to go for growing pulse after rice and assured irrigated farmers regularly going for pulse cultivation. Timely seed availability of recent varieties is a major threat to the farmers of this district. There is huge potential to increase the production and productivity of pulses crop from 20 to 30 per cent from existing production and productivity level. Hence it is proposed to introduce new varieties with short duration type with all integrated, improved package of practices and post-harvest technologies in pulses for improving the yield up to potential yield in the district.

Project components

- Demonstration (supply of seed, seed treatment & MN mixture) in all the blocks except Chitlapakkam block
- Production of foundation/certified pulses seeds in all the blocks except Chitlapakkam block
- Distribution of certified seeds, micro nutrients, weedicide and DAP Spray in all the blocks except Chitlapakkam block
- Distribution of biofertilizer (Rhizobium + Phosphobacteria) - liquid / carrier in all the blocks except Chitlapakkam block
- Cropping system based demonstration in all the blocks except Chitlapakkam block
- Pure crop demonstration - black gram and green gram in all the blocks except Chitlapakkam block

Budget

The total budget for the proposed intervention is ₹ 3310.41 Lakhs.

Expected outcome

The timely supply of seed material of ruling varieties and improved package of practices through Department of Agriculture at block level will facilitate the farmers to adopt high yielding varieties in turn to get higher income.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.3. Budget Requirement for Pulse production

(₹. 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	Purchase of breeder seeds	MT	250000	All Blocks Except B3	0	0.00	227	567.50	231	577.50	231	577.50	231	577.50	920	2300.00
2	Production of Foundation/ Certified pulses seeds	MT	86000	All Blocks Except B3	0	0.00	202	173.72	206	177.16	206	177.16	206	177.16	820	705.20
3	Distribution of Certified Seeds	MT	100000	B8	50	50.00	50	50.00	50	50.00	50	50.00	50	50.00	250	250.00
4	Distribution of Gypsum	ha	400	All Blocks Except B3,B8	0	0.00	955	3.82	1085	4.34	1085	4.34	1130	4.52	4255	17.02
5	Distribution of Biofertilizer/ Organic packages (Rhizobium + Phosphobacteria) - Liquid / Carrier	Ha	600	All Blocks Except B3,B8	0	0.00	865	5.19	985	5.91	1000	6.00	1015	6.09	3865	23.19
6	Distribution of Micro Nutrients(5 kgs/ Ha)	Ha	350	B8,B9	50	0.18	200	0.70	200	0.70	200	0.70	200	0.70	850	2.98
7	DAP Spray	Ha	700	B8	0	0.00	50	0.35	50	0.35	50	0.35	50	0.35	200	1.40
8	Pulse wonder - 5 kg/ha	Ha	1000	B9	0	0.00	100	1.00	100	1.00	100	1.00	100	1.00	400	4.00
9	Bund Cropping	Ha	300	B8	0	0.00	10	0.03	10	0.03	10	0.03	10	0.03	40	0.12
10	Line sowing	Ha	2250	B8,B9	0	0.00	70	1.58	70	1.58	70	1.58	70	1.58	280	6.30
11	Distribution of Yellow sticky trap /pheromone trap	ha	1000	B8	0	0.00	5	0.05	5	0.05	5	0.05	5	0.05	20	0.20
	Total					**50.18**		**803.94**		**818.62**		**818.71**		**818.98**		**3310.41**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5,Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.4. Enhancing the oilseeds productivity

Oilseeds are the primary source of income for many farmers in the rainfed areas. With limited scope of bringing additional area under oilseeds, increase in oilseed production will have to come primarily from a combination of high yield plant type, supply of high yielding quality certified seeds to farmers in time, increased area under oilseeds in irrigated conditions, standard crop management practices, balanced crop nutrition and timely plant protection measures against pest and diseases. Hence, it is important to create facilities for increasing production and productivity of oilseeds by adopting improved package of practices.

Project components

- Certified seed production
- Distribution of certified seeds, MN mixture, gypsum and liquid biofertilizer in all the blocks except Chitlapakkam and Sirukaverippakkam block
- Application of herbicide, bio pesticide/fungicide
- Bund cropping – castor, distribution of light traps, combined nutrient spray and seed drill sowing in Sirukaverippakkam block
- CBD - groundnut in Sirukaverippakkam block

Budget

The total cost of the project for five years works to ₹ 2467.67 Lakhs.

Expected outcome

The supply of good quality seeds, planting materials, and distribution of micronutrients, gypsum and bio-fertilizers will enhance the production and productivity of oilseeds.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.4. Budget Requirement for Oilseed production

(₹. 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	Purchase of Breeder seed	Mt	1.50	B8	60	90.00	60	90.00	60	90.00	60	90.00	60	90.00	300	450.00
2	Compact Block Demonstration - Groundnut	Ha	0.20	B8	50	10.00	50	10.00	50	10.00	50	10.00	50	10.00	250	50.00
	GROUNDNUT															
3	Strengthening seed chain by foundation seed production	Mt	0.76	B8	20	15.20	20	15.20	20	15.20	20	15.20	20	15.20	100	76.00
4	Strengthening seed chain by certified seed production	Mt	0.73	All Blocks Except B3	30	21.90	178	129.94	181	132.13	184	134.32	209	152.57	782	570.86
5	Distribution of Certified seeds	Mt	0.84	All Blocks Except B3	80	67.20	228	191.52	231	194.04	234	196.56	259	217.56	1032	866.88
6	Application of Gypsum to Groundnut Crop	Ha	0.02	B8	120	1.92	120	1.92	120	1.92	120	1.92	120	1.92	600	9.60
7	Distribution of Micro Nutrient Mixture	Ha	0.02	All Blocks Except B3,B8	0	0.00	1585	23.78	1585	23.78	1585	23.78	1585	23.78	6340	95.10
8	Distribution of Biofertilizer	Ha	0.01	All Blocks Except B3	200	1.20	1785	10.71	1785	10.71	1790	10.74	1805	10.83	7365	44.19
9	Distribution of Liquid Biofertilizer	Ha	0.01	All Blocks Except B3	200	1.20	1785	10.71	1785	10.71	1790	10.74	1805	10.83	7365	44.19

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
10	Distribution of Light Traps	Nos.	0.02	B8	150	3.00	150	3.00	150	3.00	150	3.00	150	3.00	750	15.00
11	Castor as Bund crop	Ha	0.01	B8	50	0.30	50	0.30	50	0.30	50	0.30	50	0.30	250	1.50
12	Combined Nutrient Spray	Ha	0.02	B8	50	0.75	50	0.75	50	0.75	50	0.75	50	0.75	250	3.75
13	Seed Drill Sowing / Line sowing of Groundnut with Pulses as intercrop(hiring charges only)	Ha	0.03	B8	50	1.50	50	1.50	50	1.50	50	1.50	50	1.50	250	7.50
	GINGELLY															
14	Production of Certified Seeds	Mt	1.09	All Blocks Except B3,B4,B6,B11	0	0.00	24	26.16	24	26.16	24	26.16	24	26.16	96	104.64
15	Distribution of certified seeds	Mt	1.25	All Blocks Except B3,B4,B6,B11	0	0.00	24	30.00	25	31.25	26	32.50	27	33.75	102	127.50
16	Distribution of Micro nutrients (Manganese sulphate/ Zinc sulphate)	Ha	0.00	B8,B9	0	0.00	60	0.24	60	0.24	60	0.24	60	0.24	240	0.96
	Total					**214.17**		**545.73**		**551.69**		**557.71**		**598.39**		**2467.67**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5,Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.5. Enhancing the oil palm productivity

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 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 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, Chattisgarh, Gujarat, Karnataka, Kerala, Mizoram, Nagaland, Odisha, Telangana, and West Bengal.

Project components

- Oil palm area expansion programme in Madhuranthagam block
- Inputs for intercropping and cultivation maintenance in Sirukaverippakkam block
- Supply of diesel pumps and motorised Chisel in Sirukaverippakkam block
- Supply of aluminium ladder, wire mesh and oil palm cuter in Sirukaverippakkam block

Budget

It is proposed to incur ₹ 24.25 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

Table 4.5. Budget Requirement for Oil Palm production

(₹. 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
II	**OILPALM**															
1	NMOOP -Mini Mission -II (Oilpalm)															
2	Oilpalm Area Expansion Programme	Ha	0.14	B5	90	12.60	0	0.00	0	0.00	0	0.00	0	0.00	90	12.60
3	Cultivation maintenance	Ha	0.1	B8	30	3.00	0	0.00	0	0.00	0	0.00	0	0.00	30	3.00
4	Inputs for Intercropping	Ha	0.1	B8	30	3.00	0	0.00	0	0.00	0	0.00	0	0.00	30	3.00
5	Supply of Diesel pumps	No	0.3	B8	1	0.30	0	0.00	0	0.00	0	0.00	0	0.00	1	0.30
6	Construction of Borewells	No	1	B8	1	1.00	0	0.00	0	0.00	0	0.00	0	0.00	1	1.00
7	Motorised Chisel	No	0.2	B8	20	4.00	0	0.00	0	0.00	0	0.00	0	0.00	20	4.00
8	Alumium portable ladder	No	0.06	B8	2	0.12	0	0.00	0	0.00	0	0.00	0	0.00	2	0.12
9	Wire mesh	No	0.1	B8	2	0.20	0	0.00	0	0.00	0	0.00	0	0.00	2	0.20
10	Oilpalm Cutter	No	0.03	B8	1	0.03	0	0.00	0	0.00	0	0.00	0	0.00	1	0.03
	Total					**24.25**		**0.00**		**0.00**		**0.00**		**0.00**		**24.25**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5,Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.6. Enhancing the sugarcane productivity

Sugarcane is one of the important cash crop and a perfect gift to mankind. The demand for sugarcane in the country is mainly for the purpose for which they are utilized in the various form for consumption. There exist wide variations in the productivity of sugarcane in Kancheepuram district. The low yield per hectare in most of the areas in the district needs the application of science – based production technologies. So, the strategy must be to increase the yield per hectare, by the application of latest technologies and through infrastructure developments.

Project components

- Sustainable Sugarcane Initiative (Shade net establishment and distribution of single bud seedling) in Madhuranthagam block
- Distribution of micro nutrient mixture, biofertilizer and weedicide in Sirukaverippakkam block
- Micro-irrigation – drip in all the blocks except Chitlapakkam and Kantangolathur block
- Demonstration on intercropping in Sugarcane in all the blocks except Chitlapakkam and Kantangolathur block

Budget

The total cost of the project for five years works to ₹. 1766.51 Lakhs.

Expected outcome

Fertility status of the soil will be improved by application of micronutrient mixture and biofertilizers. Hence assurance of nutritional sustainability will be kept. The timely supply of inputs will increase the production and productivity of sugarcane. Minimum of 5 to 10 tonnes increase in cane production per hectare could be achieved.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.6. Budget Requirement for Sugarcane production

(₹. in lakhs)

Sl. No	Components	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Distribution of Gypsum (500 Kg/Ha)	Ha	0.02	B1,B8,B10 ,B13,B12, B2	0	0.00	1050	21.00	950	19.00	900	18.00	925	18.50	3825	76.50
2	Distri. of biofertilizer (Ha)	Ha	0.006	B8	0	0.00	50	0.30	50	0.30	50	0.30	50	0.30	200	1.20
3	Distribution of Micro Nutrient Mixture	Ha	0.02	B8	0	0.00	50	1.00	50	1.00	50	1.00	50	1.00	200	4.00
4	Distribution of Sugarcane Booster (10 Kg/Ha)	Ha	0.035	B8	0	0.00	50	1.75	50	1.75	50	1.75	50	1.75	200	7.00
5	Distribution of Water Soluble Fertiliers	ha	0.25	B8,B5,B13 ,B12,B10	0	0.00	350	87.50	350	87.50	350	87.50	350	87.50	1400	350.00
6	Micro irrigation - Drip (1.2x0.6)	ha	1.24	B1,B8,B5, B13,B12,B 10,B 7,B2	0	0.00	220	272.80	200	248.00	180	223.20	170	210.80	770	954.80
	Sustainable Sugarcane Initiative (SSI)															
7	A. Establishment of Shadenet	Nos	1.5	B5	40	60.00	30	45.00	25	37.50	15	22.50	20	30.00	130	195.00
8	B.Distribution of Single Bud Seedling	Ha	0.225	All Blocks Except B3	40	9.00	143	32.18	133	29.93	138	31.05	138	31.05	592	133.20
9	Trash Mulching	Ha	0.04													
10	Demonstration on intercropping in Sugarcane	Ha	0.08	B13,B12,B 10,B7,B5, B1,B2	0	0.00	140	11.20	140	11.20	140	11.20	140	11.20	560	44.80
	Grand Total					**69.00**		**472.73**		**436.18**		**396.50**		**392.10**		**1766.51**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5,Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.7. Enhancing the coconut productivity

Coconut production plays an important role in the national economy of India is the third largest coconut producer in the world with an area of 2.14 million hectares accounting for a production of 14.91 million tons. Tamil Nadu topped the country in coconut production with 4.76 million tonnes (2014-15). It is cultivated across 0.46 million hectares in the state. Tamil Nadu, Kerala and Karnataka are the major producers of coconut contributing for 83 per cent both in total area and production of the country. This increased production could be achieved by distribution of good quality hybrid seedlings and collective farming approaches.

Project components

- Distribution of T × D hybrid seedlings and tall seedlings in all the blocks
- Collective farming - corpus fund release for FPG in all the blocks
- Drip irrigation in Sirukaverippakkam block

Budget

The total cost of the project for five years works to ₹ 75.81 Lakhs.

Expected outcome

The implementation of the project will result in a minimum increase of coconut planting. This will help the coconut growing farmers to increase the area and productivity. This will help to increase the employment opportunity and income of the farming community.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.7. Budget Requirement for Coconut production

(₹. 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	0	0.00	300	0.18	300	0.18	300	0.18	300	0.18	1200	0.72
2	Distribution of Tall Seedlings	No	0.0004	All Blocks	0	0.00	3180	1.272	3180	1.272	3180	1.272	3180	1.272	12720	5.088
3	Drip irrigation	Ha	0.3500	B8	0	0.00	50	17.5	50	17.5	50	17.5	50	17.5	200	70.00
	Grand Total					**0.00**		**18.95**		**18.95**		**18.95**		**18.95**		**75.81**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5,Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.8. Infrastructure Development

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. Storage Godown, Bio-fertilizer production unit operating in the State are doing women services to the farming community and public by providing technical advices and expertise for the holistic development of the farmers. They also prioritize their actions so as to ensuring food and nutritional security. However, they are not endeavored with adequate infrastructure, which is absolutely essential for growth and development. Strengthening the existing and creating new assets/amenities would bring profound influence on the constructive and technical services effectively.

Project components

- Storage godown in Sriperumbudhur block
- Establishment of Threshing floor/drying yard at Thirukazhukundram
- Strengthening of Bio-fertilizer production unit at Kantangolathur block
- Office Furnishings and other amenities in all blocks except Pavinjur and Sirukaverippakkam blocks
- Tonnage, electronic platform balance and moisture meter in all blocks except Sirukaverippakkam block

Budget

It is proposed to incur **₹ 1461.65 Lakhs** over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

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

Implementing agency

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

Table 4.8. Budget Requirement for Infrastructure development

(₹. in lakhs)

Sl. No	Components	Unit	Unit Cost (in Rs.)	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	Seed Godown (300 MT)	Nos.	2500000	B9	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	1	25.00
2	Strengthening of Bio-fertilizer production unit	Nos.	6000000	B4	0	0.00	1	60.00	0	0.00	0	0.00	0	0.00	1	60.00
3	Establishment of Threshing floor/drying yard	Nos.	500000	B10	0	0.00	0	0.00	12	60.00	12	60.00	12	60.00	36	180.00
4	Tonnage	Nos.	7500	All Blocks Except B8	0	0.00	1300	97.50	810	60.75	250	18.75	530	39.75	2890	216.75
5	Moisture meter	Nos.	25000	All Blocks Except B8	0	0.00	12	3.00	0	0.00	0	0.00	0	0.00	12	3.00
6	Bag closure	Nos.	10000	All Blocks Except B8	0	0.00	12	1.20	0	0.00	0	0.00	0	0.00	12	1.20
7	Seed rack	Nos.	30000	All Blocks Except B8	0	0.00	24	7.20	0	0.00	0	0.00	0	0.00	24	7.20
8	Tarpaulin	Nos.	25000	All Blocks Except B8	0	0.00	260	65.00	260	65.00	260	65.00	190	47.50	970	242.50
9	Office Furnishings and other amenities	Nos.	200000	All Blocks Except B7, B8	0	0.00	22	44.00	22	44.00	22	44.00	22	44.00	88	176.00
10	Strengthening of training institute / nursery / FTC / KVK	Nos.	50000000	All Blocks	0	0.00	0	0.00	0	0.00	1	500.00	0	0.00	1	500.00
11	Infrastructure for empowerment of coconut nurseries	Nos.	5000000	All Blocks	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00
	Grand total					**0.00**		**352.90**		**229.75**		**687.75**		**191.25**		**1461.65**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5,Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.9. Rainfed Area Development

Rainfed areas account for nearly 57 per cent of the agricultural land in India. Rainfed areas if managed properly have the potential to contribute a larger share in the food grain production. These high potential rainfed areas provide us with opportunities for faster agricultural growth compared to irrigated areas that have reached a plateau in-fact the potential is such that there is more opportunity for faster agricultural growth here than in irrigated areas. With proper management, rainfed areas have the potential of contributing a larger share to food grain production. Increasing agricultural productivity of rainfed areas in a sustainable manner by adopting appropriate farming system based approaches through restoration of confidence in rainfed agriculture by creating sustained employment opportunities through improved on-farm technologies and cultivation practices. Livelihood support to farmers of rainfed areas through poverty reduction.

Project components

- Milch Animal (1 no) + 1 ha cropping system with inter crop & border plantation like castor/sesbania *etc*. in Sirukaverippakkam block
- Small ruminant (9+1)+ 1 ha Tree based farming system (Cropping system with inter crop & border plantation like castor/sesbania etc.) @ Rs.23500/ as subsidy per unit in Sirukaverippakkam block

Budget

It is proposed to incur ₹ 10.98 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 the rainfed 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 4.9. Budget Requirement for Rainfed Area Development

(Rs in lakhs)

Sl. No	RAD	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	Milch Animal (1 no) + 1 ha cropping farming system (Cropping system with inter crop & border plantation like castor/sesbania etc.) @ Rs.27500/ as subsidy per Unit	Ha	0.55	B8	0	0.00	2	1.10	2	1.10	2	1.10	2	1.10	8	4.40
2	Small ruminant (9+1)+ 1 ha Tree based farming system (Cropping system with inter crop & border plantation like castor/sesbania etc.) @ Rs.23500/ as subsidy per Unit	Ha	0.47	B8	0	0.00	2	0.94	3	1.41	4	1.88	5	2.35	14	6.58
	Grand Total					**0.00**		**2.04**		**2.51**		**2.98**		**3.45**		**10.98**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5,Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.10. Integrated Pest Management

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 pest 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.

Interventions

- Conducting Farmers Field Schools (FFS) and Field days in all the blocks of Sirukaveripakkam.
- Establishment of Coconut parasite breeding station in Acharapakkam, Chitampudur, Madhurandhagam, Pavinjur, Thirukazhukundram, Uthiramerur and Walajabad blocks

Budget

It is proposed to incur ₹ 299.20 Lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

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.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.10. Budget Requirement for Rainfed Area Development

(Rs 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	0	0.00	38	7.60	37	7.40	38	7.60	38	7.60	151	30.20
2	Field days	No.	20000	All Blocks Except B8	0	0.00	44	8.80	30	6.00	23	4.60	23	4.60	120	24.00
3	Establishment of Coconut Parasite Breeding Station	Nos.	3500000	B1,B13,B12,B10,B7,B5,B2	0	0.00	7	245.00	0	0.00	0	0.00	0	0.00	7	245.00
	Total					**0.00**		**261.40**		**13.40**		**12.20**		**12.20**		**299.20**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5,Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.11. 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 Kancheepuram district.

Project component

- Distribution of tractor and power tiller in all blocks except Chitlapakkam block
- Distribution of rotavator and Tarpaulin in all blocks except Chitlapakkam block
- Distribution of pump set and PVC pipes to carry irrigation water from source to field in all the blocks
- Distribution of power operated sprayers and battery operated sprayers, Solar light trap in all the blocks

Budget

Agricultural mechanization programs are proposed to implement in a big way to increase the agricultural production and to popularize the agricultural machinery among the farmers of this district with a budget of ₹ 8473.04 Lakhs

Expected outcome

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

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.11. Budget Requirement for Farm Mechanization

(Rs in lakhs)

l.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	Solar light trap	No.	4000	All Blocks B3	720	28.80	1040	41.60	1160	46.40	1100	44.00	560	22.40	4580	183.20
2	Battery operated sprayer	Nos.	4000	All Blocks	0	0.00	202	8.08	210	8.40	222	8.88	242	9.68	876	35.04
3	Power operated sprayer	Nos.	8000	All Blocks	0	0.00	500	40.00	545	43.60	580	46.40	590	47.20	2215	177.20
4	Distribution of Baler	Nos	350000	B4,B11,B9, B6	0	0.00	8	28.00	8	28.00	8	28.00	8	28.00	32	112.00
5	Distribution of Mini Tractor	Nos	300000	All Blocks Except B3	0	0.00	60	180.00	60	180.00	60	180.00	60	180.00	240	720.00
6	Distribution of Mobile Sprinklers	Ha	30000	All Blocks Except B3	0	0.00	600	180.00	680	204.00	520	156.00	440	132.00	2240	672.00
7	Distribution of Paddy transplanter	Nos	1200000	All Blocks Except B3	0	0.00	44	528.00	20	240.00	20	240.00	28	336.00	112	1344.00
8	Distribution of Powertiller	Nos	150000	All Blocks	24	36.00	102	153.00	142	213.00	118	177.00	102	153.00	488	732.00
9	Distribution of Pumpset	Nos	30000	All Blocks	0	0.00	77	23.10	85	25.50	77	23.10	77	23.10	316	94.80
10	Distribution of Rain guns	Ha	40000	All Blocks Except B3	0	0.00	500	200.00	580	232.00	500	200.00	500	200.00	2080	832.00
11	Distribution of Rotavator	Nos	80000	All Blocks B3	0	0.00	145	116.00	152	121.60	160	128.00	168	134.40	625	500.00
12	Distribution of	Nos	8000	All Blocks B3	0	0.00	400	32.00	400	32.00	420	33.60	440	35.20	1660	132.80

	Tarpaulins															
13	Distribution of Tractor	Nos	600000	All Blocks B3	0	0.00	72	432.00	76	456.00	68	408.00	88	528.00	304	1824.00
14	Distribution of Tractor Drawn Seed cum Fertilizer Drill	Nos	70000	All Blocks Except B3	0	0.00	140	98.00	100	70.00	100	70.00	100	70.00	440	308.00
15	PVC Pipes to carry Irrigation water from source to field	Unit	40000	All Blocks	0	0.00	325	130.00	365	146.00	365	146.00	285	114.00	1340	536.00
16	Solar power pump system	Nos	600000	B1,B13,B12,B6,B5,B2	0	0.00	11	66.00	16	96.00	11	72.00	5	36.00	43	270.00
	Total					**64.80**		**2255.78**		**2142.50**		**1960.98**		**2048.98**		**8473.04**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5, Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.12. Strengthening of State Seed Farm

Seed is the basic and most critical input for sustainable agriculture. The response of all other inputs depends on quality of seeds to a large extent. It is estimated that the direct contribution of quality seed alone to the total production is about 15–20 per cent depending upon the crop and it can be further raised up to 45 per cent 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. 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. Therefore, the infrastructure facilities at the SSFs like levelled land, more area, assured irrigation, threshing floor, drying yard, processing units, storage *etc*., are essential to produce, process and pack quality seeds. Therefore, the strengthening of state seed farms is aimed for quality seed production in Tamil Nadu.

Project components

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

Budget

It is proposed to incur ₹ 749.80 Lakhs over a period of five years

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 4.12. Budget Requirement for Strengthening of State Seed Farm

(Rs in lakhs)

Sl. No	Components	unit	unit cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
I	**Soil Fertility Improvement and Land development works in SSF**	ac	2	B9	0	0	60	120.00	60	120.00	60	120.00	60	120.00	240	480.00
II	**Irrigation Component**															
1	Solar pumpsets	nos	6	B9	0	0	2	12.00	0	0.00	0	0.00	0	0.00	2	12.00
2	Deepening of bore well	nos	4	B8,B9	0	0	3	12.00	0	0.00	0	0.00	0	0.00	3	12.00
3	Laying of pipelines	mt	0.05	B9	0	0	2	0.10	0	0.00	0	0.00	0	0.00	2	0.10
4	Rain gun	nos	0.4	B8,B9	0	0	105	42.00	0	0.00	0	0.00	0	0.00	105	42.00
5	Mobile sprinkler	nos	0.3	B8,B9	0	0	0	0.00	20	6.00	0	0.00	0	0.00	20	6.00
6	Laying of drip	nos	2	B9	0	0	10	20.00	0	0.00	0	0.00	0	0.00	10	20.00
7	New open well+ Pumpset	nos	10	B9	0	0	5	50.00	0	0.00	0	0.00	0	0.00	5	50.00
8	Farm Pond	nos	1	B9	0	0	3	3.00	0	0.00	0	0.00	0	0.00	3	3.00
III	**Machineries**															
9	Dunnage (Poly Pallets)	nos	0.075	B9	0	0	0	0.00	150	11.25	0	0.00	0	0.00	150	11.25
10	Tarpaulin	nos	0.1	B8,B9	0	0	0	0.00	25	2.50	2	0.20	0	0.00	27	2.70
11	Generator	nos	7	B9	0	0	0	0.00	1	7.00	0	0.00	0	0.00	1	7.00
IV	**Civil Works**															
12	Farm protection structure	mt	0.15	B9	0	0	0	0.00	5	0.75	0	0.00	0	0.00	5	0.75
13	New Threshing floor	nos	5	B9	0	0	0	0.00	2	10.00	0	0.00	0	0.00	2	10.00
14	Farm office	nos	8	B9	0	0	0	0.00	3	24.00	0	0.00	0	0.00	3	24.00
15	culvert	nos	6	B8,B9	0	0	0	0.00	2	12.00	2	12.00	0	0.00	4	24.00
16	Farm connectivity	Meter	0.015	B9	0	0	0	0.00	3000	45.00	0	0.00	0	0.00	3000	45.00
	Total					**0**		**259.10**		**238.50**		**132.20**		**120.00**		**749.80**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5,Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.1.13. Agricultural Information Technology

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.

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

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

Budget

It is proposed to incur ₹ 163.42 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 4.13. Budget Requirement for Strengthening of State Seed Farm

(Rs 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	Connectivity Charges	Nos	11000	All Blocks		0	13	1.43	0	0.00	0	0.00	13	1.43	26	2.86
2	Printer cum Scanner	Nos	20000	All Blocks		0	13	2.60	0	0.00	0	0.00	13	2.60	26	5.20
3	UPS and Electrical Accessories	Nos	35000	All Blocks		0	13	4.55	0	0.00	0	0.00	13	4.55	26	9.10
4	Xerox machine	Nos	75000	All Blocks		0	13	9.75	0	0.00	0	0.00	13	9.75	26	19.50
5	Laptop/Desktop	Nos	50000	All Blocks		0	26	13.00	0	0.00	0	0.00	26	13.00	52	26.00
6	Anti -virus software	Nos	2500	All Blocks		0	26	0.65	0	0.00	0	0.00	26	0.65	52	1.30
7	Television	Nos	100000	All Blocks		0	13	13.00	0	0.00	0	0.00	13	13.00	26	26.00
8	Colour printer	Nos	15000	All Blocks		0	13	1.95	0	0.00	0	0.00	13	1.95	26	3.90
9	4G Internet - Dongle	Nos	2500	All Blocks		0	39	0.98	0	0.00	0	0.00	39	0.98	78	1.95
10	**Equipments for Documentation**															
a	Handycam	Nos	30000	All Blocks		0	13	3.90	0	0.00	0	0.00	13	3.90	26	7.80
b	Camera	Nos	25000	All Blocks		0	13	3.25	0	0.00	0	0.00	13	3.25	26	6.50
c	GPS instrument	Nos	20000	All Blocks		0	13	2.60	0	0.00	0	0.00	13	2.60	26	5.20
d	Android mobile	Nos	15000	All Blocks		0	26	3.90	0	0.00	0	0.00	26	3.90	52	7.80
e	External Hard disk	Nos	5000	All Blocks		0	13	0.65	0	0.00	0	0.00	13	0.65	26	1.30
11	LCD projector	Nos	75000	All Blocks		0	13	9.75	0	0.00	0	0.00	13	9.75	26	19.50
12	pico Projector	Nos	35000	All Blocks		0	13	4.55	0	0.00	0	0.00	13	4.55	26	9.10
13	Air conditioner for computer room	Nos	40000	All Blocks		0	13	5.20	0	0.00	0	0.00	13	5.20	26	10.40
	Total					**0**		**81.71**		**0.00**		**0.00**		**81.71**		**163.42**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5, Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

Table 4.14 Budget Requirement for Agriculture Sector

(Rs.in lakhs)

Sl. No.	Interventions	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Rice	609.83	1434.54	1392.15	1384.41	1230.42	6051.33
2	Millets	28.68	126.99	148.89	153.30	140.70	598.56
3	Pulses	50.18	803.94	818.62	818.71	818.98	3310.43
4	Oilseeds	214.17	545.73	551.69	557.71	598.39	2467.67
5	Oilpalm	24.25	0.00	0.00	0.00	0.00	24.25
6	Cotton	0.00	0.00	0.00	0.00	0.00	0.00
7	Sugarcane	69.00	472.73	436.18	396.50	392.10	1766.51
8	Coconut	0.00	18.95	18.95	18.95	18.95	75.80
9	Training	0.00	0.00	0.00	0.00	0.00	0.00
10	Infrastructure	0.00	352.90	229.75	687.75	191.25	1461.65
11	Soil Health Management	0.00	0.00	0.00	0.00	0.00	0.00
12	Rainfed Area Development	0.00	2.04	2.51	2.98	3.45	10.98
13	Integrated Pest Management	0.00	261.40	13.40	12.20	12.20	299.20
14	Farm Mechanization	64.80	2255.78	2142.50	1960.98	2048.98	8473.04
15	Strengthening of State Farm	0.00	259.10	238.50	132.20	120.00	749.80
16	Agriculture Information Technology	0.00	81.71	0.00	0.00	81.71	163.42
	Total	**1060.91**	**6615.81**	**5993.14**	**6125.69**	**5657.13**	**25452.64**

4.2. Horticulture

4.2.1 Enhancing the productivity of horticultural crops

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

Area expansion of Horticultural crops

a. Fruit Crops

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

b. Vegetable crops

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

c. Flower crops

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

d. Spice crops

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

e. Plantation crops

Plantation crops are high value commercial crops of greater economic importance and play a vital role in our Indian economy. These crops help to conserve the soil and ecosystem. The crops include tea, coffee, rubber, cocoa, coconut, arecanut, 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.

f. Area expansion by Precision Farming Technology

By providing inputs like water soluble fertilizers, hybrid / high yielding vegetable seeds and plant protection chemicals, the area under annual crops like vegetables, flowers, spices, medicinal plants and one year long season crops like banana, tapioca, annual moringa and turmeric could be raised under precision farming technology.

g. Area expansion by high density planting

By adopting high density planting in mango, guava and sapota, the area under fruit trees could be increased. This includes supply of pedigree planting materials, integrated nutrient management and integrated pest management.

h. Area expansion by Normal Planting

Besides precision farming and high density planting, the area could be increased by normal planting as well by using pedigree planting materials in fruits, spices, flowers and plantation crops. Similarly, by extending support for the planting materials of high value vegetables, the protected cultivation of vegetable area could also be increased. Likewise, cultivation of cut flowers and filler foliage also need to be encouraged.

Rejuvenation of Old Orchards – Mango and Guava

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 restore the 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.

Pollination support

Pollination of fruits, vegetables, spices and plantation crops would be enhanced through the establishment of bee hives and colonies.

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 formed 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.

Rainfed Area Development Programme (RADP)

Rainfed areas assume special significance in terms of ecology, agricultural productivity and livelihood for millions of rural households in India. To ensure agriculture growth in the rainfed areas, the Government of India launched a new scheme "Rainfed Area Development Programme (RADP)" in the year 2011-12 as a sub-scheme under Rashtriya Krishi Vikas Yojana (RKVY). It aims at improving quality of life of farmers especially, small and marginal farmers by offering a complete package of activities to maximize farm returns. RADP focuses on Integrated Farming System (IFS) for enhancing productivity and minimizing risks associated with climatic variabilities.

Special Interventions

a. Production Enhancement through Precision Farming

Farmers have experienced fruitful results of technology especially during the past five years. Hence further increase in the production of horticultural crops would be possible both by increasing area and productivity by adopting advanced technologies like precision

farming, high density planting, protected cultivation, shade net nursery, integrated pest management and integrated nutrient management. Besides increasing infrastructure and mechanization facilities, productivity enhancement is considered by area expansion and resorting to high tech cultivation practices. Annual crops like vegetables, flowers, spices, medicinal plants and one year long season crops like banana, tapioca, turmeric and annual moringa could be considered for expansion by precision farming technology and providing assistance for inputs like water soluble fertilizers, hybrid/ high yielding vegetable seeds, plant protection chemicals *etc.*, with subsidy.

b. Pandal / Trellis cultivation, Propping / Support / Staking

Pandal vegetables being short duration crops fit very well in the cropping system by offering viable option to the growers to get increased income per unit area. However, the cultivation of vegetables is too constrained due to high initial investment cost. With the objective of enhancing area under pandal vegetables and encouraging farmers to realize increased income, this project is proposed by popularizing high yielding/hybrid seed materials and dissemination of improved method of cultivation to farmers. It is proposed to cover at least 500 hectares in crops like bitter gourd, ribbed gourd, snake gourd, pandal beans *etc*.

c. Banana Bunch Sleeve

'Bunch care techniques' are to be followed in banana cultivation to achieve the best quality. Transparent polyethylene sleeves are recommended to cover the bunch immediately after opening of the last hand. Using of opaque polythene covers / sleeves gauge (during winter) and paper bags (to avoid chilling injury at frost conditions and sun scroch). The bunch will be free from insect bites, fungi, bacteria attacks and physical injuries. The cover will also improve bunch appeal and maturity of bunch will be advanced by 7 to 10 days.

d. Agro Ecosystem Analysis (AESA) based IPM

The IPM has been evolving over the decades to address the deleterious impacts of synthetic chemical pesticides on environment ultimately affecting the interests of the farmers. The economic threshold level (ETL) was the basis for several decades but in modern IPM (FAO 2002) emphasis is given to AESA where farmers take decisions based on larger range of field observations. Decision making in pest management requires a thorough analysis of the agro-ecosystem. Farmer has to learn how to observe the crop, how to

analyze the field situation and how to make proper decisions for their crop management. This process is called the AESA.

e. Control of coconut Red Palm weevil

Coconut is a perennial crop and longevity of the tree is about 50 to 70 years. The red palm weevil is a fatal enemy and less than 20 years coconut palm succumbs to severe damage when infected. Hence it is highly necessary to control the attack of red palm weevil pest on war footing. It is programmed to distribute 50, 000 traps of ferrolure of five traps per ha for 1.00 lakh hectare with subsides assistance of 50 per cent. The total cost for one hectare of Rs.325/ferrolure comes to Rs.3,250. Hence, an assistance of Rs.1600/ha is proposed for five ferrolure per ha.

f. Promotion of Roof top Garden / Potager garden

The traditional kitchen garden, also known as a potager is a space separate from the rest of the residential garden *i.e.* the ornamental plants and lawn areas. Most vegetable gardens are still miniature versions of old family farm plots, but the kitchen garden is different not only in its history, but also its design. The kitchen garden may serve as the central feature of an ornamental, all-season landscape, or it may be little more than a humble vegetable plot. It is a source of herbs, vegetables and fruits, but it is often also a structured garden space with a design based on repetitive geometric patterns. The kitchen garden has year-round visual appeal and can incorporate permanent perennials or woody shrub plantings around (or among) the annuals. There are many types of vegetable gardens. The potager, a garden where vegetables, herbs and flowers are grown together, has become more popular than the more traditional rows or blocks. Some popular culinary herbs in temperate climates are to a large extent still the same as in the medieval period. Herbs often have multiple uses. For example, mint may be used for cooking, tea and pest control.

g. Perimetro Vegetable Cluster Development Programme

Since production of vegetables is not in accordance with the market demand and the productivity of many vegetables is less than the potential yield, farmers are to be motivated to plan for cultivation of vegetables based on market demand. Market led production of vegetables need to be taken up to ensure continuous supply of vegetables to the market and the grower to get increased return out of sale of produce. Hence, it is necessary to go in for the productivity enhancement by advanced technologies. The project involves vegetable

cultivation under protected condition, post-harvest management, collection centres, retail outlets and training to the growers. The vegetable produced in the project area will be immediately transported to the pack house where grading, sorting and standard packing will be done. Further to narrow down the supply chain, open retail outlets and mobile stores are proposed.

h. Establishing Centre of Excellence for different crops

Centre of Excellence for Horticulture crops like fruits, vegetables and flowers are aimed at designing, manufacturing and installation of State of the art facilities be it greenhouse technology, environmental control systems, tissue culture labs, crop production modules specializes in developing Centre of Excellence for fruits, vegetables and flowers in different states of India.

i. Computerization and Governance

As per the Stated policy under the scheme of E-governance and computerization of the various Development Departments, desktop computers and associated equipments had been contemplated. In order to ensure effective implementation of E-Governance, computer equipments (such as laptops, personal computers, Tablets *etc*) are essential.

j. Research on Crop Diversification

Crop Diversification refers to a shift from the regional dominance of one crop to regional production of a number of crops, to meet ever increasing demand of cereals, pulses, vegetables, fruits, oilseeds, fibres, fodder, grasses *etc*. It aims to improve soil health and to maintain dynamic equilibrium of the agro-ecosystem. In the instant case, crop diversification is intended to promote technological innovations for sustainable agriculture and enable farmers to choose crop alternatives for increased productivity and income.

Crop Insurance

Crop Insurance coverage has to be done for major crops like paddy, millets, pulses, oilseeds, sugarcane, cotton, cash crops and all Horticulture crops in the notified areas.

Infra structures and Assets

Protected cultivation

Precision Farming through Hi tech cultivation Practices It is proposed to plan for increasing the production of crops by adopting advanced technology like high tech cultivation practices which includes high density planting, use of quality planting materials,

tissue culture planting materials, canopy management, micro irrigation fertigation, mulching, use of bunch sleeves for banana, protected cultivation, shade net nursery and mechanization in horticulture crop cultivation by popularizing the same among the growers to enhance productivity. It is proposed to adopt high density planting in mango, guava and sapota in select districts of the State by providing subsidy.

Mushroom production

Commercial production of edible Mushrooms converts the agricultural, industrial, forestry and household wastes into nutritious food (Mushroom). Indoor cultivation of oyster mushrooms utilizes the vertical space and is regarded as the highest protein producer per unit area and time – almost 100 times more than the conventional agriculture and animal husbandry.

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. Therefore it's necessary to establish a permanent vermicompost unit.

Supporting structures for vegetable production

Vegetables are excellent source of vitamins and minerals such as calcium, iron besides proteins and carbohydrates. Vegetables combat under nourishment and are known to be a cheapest source of natural protective tools.

a. Staking, trellis and propping

Though most vegetables grow on their own, plants with vining and sprawling growth or with brittle stems and heavy fruits need support. Peas, cucumbers, pole beans, tomatoes, squash, eggplants and peppers benefit from trellising, caging or staking. The trick to heavy harvests knows which vegetable support system works best for each plant. Trellising, which involves tying plant stems to vertical structures with garden twine or plant ties, allows you to

fit more plants in the garden. It is the preferred support method for peas, indeterminate vine-type tomatoes, pole and runner beans, cucumbers and smaller squash varieties.

b. Pandal structure

Pandal vegetables, being short duration crops, fit very well in the intensive cropping system. It offers viable option for the growers to get increased income per unit area. It includes number of vegetables viz. bitter gourd, snake gourd, ribbed gourd, pandal avarai *etc*. These vegetables are grown on commercial scale and are capable of giving high yields and high economic returns to the growers. It has tremendous market potential. The cultivation of vegetables is constrained due to high initial investment cost. With the objective of enhancing area under pandal vegetables and encouraging farmers to obtain increased income, it is proposed to implement the project on “Encouraging Cultivation of Pandal Vegetables”. In this situation, financial support for the establishment of pandal structures for the vegetables will increase in the area and production of pandal vegetables. Along with which the support on supply of high yielding / hybrid seed materials for cultivation will be additional assistance among the farmers to get enhanced yield per unit area.

District Horticulture information and training centre

The information centre also houses a training centre where all the training programmes are being imparted. This includes training under various schemes like Mission for Integrated Development of Horticulture, Micro Irrigation, Medicinal plants, Perimetro Vegetable Cluster Development Scheme, ATMA (SSEPER) *etc*. The Centre would not only provide employment, but also training to agriculturists in batches on raising vegetable and horticultural crops and conduct orientation programme for Department officials.

Additionally, to augment the promotion of cut flowers and other horticulture crops cold storage facilities can also be made in the horticulture complex. The other facilities like glass house, green house for production and multiplication of ornamental plants will also be established in the training centre for demonstration purpose.

Community Seed Banks (CSBs) are places of storage where indigenous seed varieties are conserved and managed by community members. These ex-situ conservation sites provide farmers with free and easy access to traditional seeds under the condition that a farmer returns twice the amount of seeds he or she borrowed. They not only reduce farmers’ dependence on seed companies but also help conserve the agro-biodiversity of

their villages. These seed banks form the cornerstone of GREEN's efforts for biodiversity conservation through community empowerment.

Post-Harvest Management

In agriculture, postharvest handling is the stage of crop production immediately following harvest, including cooling, cleaning, sorting and packing. Postharvest treatment largely determines final quality, whether a crop is sold for fresh consumption, or used as an ingredient in a processed food product. The most important goals of post-harvest handling is to avoid moisture loss and slow down undesirable chemical changes, and avoiding physical damage such as bruising, to delay spoilage. Sanitation is also an important factor, to reduce the possibility of pathogens that could be carried by fresh produce, for example, as residue from contaminated washing water.

Modernization of State Horticulture Farms

In Tamil Nadu, there are 52 State Horticulture Farms including six parks and garden. The prime objectives of these farms are to produce pedigree planting materials of fruits, flowers, spices and vegetables. The quality planting materials produced in these farms are distributed to the farmers directly and through various schemes of the department. The parks and garden serve as study centre to the students apart from educating the public on Eco preservation. It is programmed to expand the production of planting materials of various kinds of fruits viz., mango, guava, sapota and flowers like rose, jasmine and ornamental plants and avenue trees by modernizing the nurseries, developing the farms as demonstration centres for the latest techniques in horticulture, enhancing the productivity and augmenting farm mechanization for increasing the efficiency.

Horticultural mechanization

With increasing agricultural labour shortage in India, a calculated shift to mechanization is imperative. Not only does mechanization provide for optimal utilization of factor resources (*viz.,* land, labour, water, capital and expensive farm inputs), it also helps farmers to save valuable time and effort. Judicious use of time, labour and resources helps facilitate sustainable intensification (multi-cropping) and timely planting of crops and towards giving crops more time to mature, leading to improved productivity.

Micro Irrigation, Water harvesting and Management

With increasing demand on water from various sectors, the availability of water is under severe stress. Agriculture sector is the largest use of water. While irrigation projects (Major and medium) have contributed to the development of water resources, conventional methods of irrigation are inefficient and lead to wastage of water. It has been recognized that the use of modern irrigation methods like drip and sprinkler irrigation are the ways for the efficient use of surface as well as ground water resources. Majority of fruit trees / orchards are under rainfed cultivation. It is advisable to bring a minimum percentage of the area under irrigation by providing and strengthening the water harvesting system. This includes provision of drip irrigation facilities wherever possible, recharge of defunct bore wells, provision of pipes and protected distribution system, provision of water lifting devices, *insitu* water conservation and the like.

Capacity building of Horticultural Officers and Farmers

In service training of horticultural officers regularly would help them to update the modern technologies in production, marketing and value addition of horticultural crops including organic farming. Similarly, exposure visits to farmers to nearby districts / States and even foreign countries would help them aware and adopt new innovative technologies.

Budget

The budget requirement for fulfilling the various interventions is **₹. 4531.53 Lakhs**.

Implementing agency

The projects will be implemented by the Department of Horticulture.

Table 4.15. Budget Requirement for Horticulture

(₹. in lakhs)

Sl. No.	Interventions	Unit	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.
A	**Production Growth**															
	Area expansion of fruit crops															
1	Normal Planting in lime / lemons	Ha	0.6	B2,B6	3	1.80	0	0.00	0	0.00	0	0.00	0	0.00	3	1.80
2	Normal Planting in Mango	Ha	0.6	All Blocks	24	14.40	26	15.60	29	17.40	34.5	20.70	37	22.20	150.5	90.30
3	Normal planting in Guava	Ha	0.6	All Blocks	25.5	15.30	26	15.60	28.5	17.10	29.5	17.70	31.5	18.90	141	84.60
4	Normal planting in Papaya	Ha	0.6	B1,B2,B6,B7, B8,B9,B10,B 13	8	4.80	8	4.80	7.5	4.50	8	4.80	9	5.40	40.5	24.30
B	**Area expansion of vegetable crops**															
5	Brinjal	Ha	0.5	All Blocks	73	36.50	79.5	39.75	88.5	44.25	92.5	46.25	98.5	49.25	432	216.00
6	Bhendi	Ha	0.5	All Blocks	84	42.00	88	44.00	92	46.00	100	50.00	107.5	53.75	471.5	235.75
7	Gourds including pumpkin and tinda	Ha	0.5	All Blocks	75	37.50	80	40.00	83.5	41.75	89.5	44.75	94.5	47.25	422.5	211.25
8	Greens	Ha	0.5	All Blocks Except B9	26	13.00	25	12.50	27	13.50	31	15.50	33.5	16.75	142.5	71.25
9	Melons	Ha	0.5	All Blocks except B3,B4,B5	148	74.00	154	77.00	168.5	84.25	180.5	90.25	194	97.00	845	422.50
C	**Area expansion of Spices crops**															
10	Seed and Rhizomatic spices (Coriander, Turmeric, Ginger, Dry Chilly, Cumin, Fennel, Fenugreek, Dil, Cardamom etc.,)	Ha	0.3	All Blocks	66	19.80	70.5	21.15	80	24.00	84	25.20	90.5	27.15	391	117.30

Sl. No.	Interventions	Unit	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.
11	Perennial spices (Pepper, Curry leaf, All spice, Cinnamon, Clove, Tamarind, Nut meg etc.,)	Ha	0.5	B13	1	0.50	1	0.50	1.5	0.75	1.5	0.75	1.5	0.75	6.5	3.25
D	**Area expansion of Flower crops**															
12	Loose flowers - Jasminumsp, Crossandra, Marigold, Rose, Chrysanthemum, Neerium, Torenia	Ha	0.4	All Blocks	80	32.00	86	34.40	91.5	36.60	97	38.80	102	40.80	456.5	182.60
E	**Rejuvenation/INM-IPM/Mulching/Anti bird net**															
13	INM/IPM for Horticultural crops	Ha	0.04	All Blocks except B3,B5	15	0.60	15	0.60	15	0.60	15	0.60	15	0.60	75	3.00
14	Mulching	Ha	0.32	All Blocks except B3,B5	26.5	8.48	29	9.28	31	9.92	35.5	11.36	37	11.84	159	50.88
F	**Organic Farming**															
15	Organic farming and PGS certification in 50 acre cluster	1 cluster	14.95	B6	1	14.95	0	0.00	0	0.00	0	0.00	0	0.00	1	14.95
16	HDPE Vermibed	No	0.16	B2,B6,B7,B10	3	0.48	3	0.48	3	0.48	3	0.48	3	0.48	15	2.40
G	**Rainfed Area development**															
17	Integrated farming system - Horticulture Based farming	Ha	0.5	B10	0	0.00	0	0.00	150	75.00	200	100.00	100	50.00	450	225.00
18	Moisture stress management - Minimum irrigation guarantee by PUSA hydrogel	Ha	0.1	All Blocks except B3	24	2.40	19	1.90	30	3.00	39	3.90	59	5.90	171	17.10
H	**Infra structures and Assets creation**															
19	Poly Green House	1000 Sq.m	9.35	All Blocks except	3	28.05	4	37.40	5	46.75	4	37.40	4	37.40	20	187.00

Sl. No.	Interventions	Unit	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.
				B3,B5,B9,B13												
20	Shadenet	1000 Sq.m	7.1	B4,B5,B8,B10,B12, B13	2	14.20	2	14.20	3	21.30	2	14.20	3	21.30	12	85.20
I	**Mushroom production**															
21	Cottage mushroom unit	1 No.	1	All Blocks except B3,B5,B9,B10	3	3.00	7	7.00	6	6.00	6	6.00	6	6.00	28	28.00
J	**Vermicompost unit**															
22	Permanent Vermicompost Unit	600 cu.ft	1	B2,B6,B7,B8, B12, B13	5	5.00	1	1.00	3	3.00	3	3.00	4	4.00	16	16.00
K	**Supporting structures for Horticulture crop production**															
23	Staking/ Trellies/ Propping	Ha	1	All Blocks except B1,B3,B4,B9	22.5	22.50	25.5	25.50	27.5	27.50	33.5	33.50	37.5	37.50	146.5	146.50
24	Permanent Pandhal structure	Ha	4	All Blocks except , B3, B4, B5,B9	8.5	34.00	8	32.00	11.5	46.00	13	52.00	13.5	54.00	54.5	218.00
L	**District Horticulture information and training centre**															
	Community seed bank															
	Special interventions															
25	Farm deficiency correction	Ha	0.04	B10	20	0.80	20	0.80	20	0.80	20	0.80	20	0.80	100	4.00
26	Promotion of Roof top Garden/ Potager garden Kit	No	0.005	B3,B5,B8,B9, B10,B11,B12, B13	6750	33.75	2300	11.50	2420	12.10	2530	12.65	2650	13.25	16650	83.25
27	Banana Bunch Sleeve	Ha	0.25	B10,B11	55	13.75	50	12.50	50	12.50	0	0.00	0	0.00	155	38.75
28	AESA based IPM in fruits and vegetables Pheramone trap	Ha	0.04	All Blocks except B3	98	3.92	105	4.20	116	4.64	128	5.12	138	5.52	585	23.40
29	AESA Based IPM in fruits and vegetables	Ha	0.04	All Blocks except B3	98	3.92	112	4.48	124	4.96	135	5.40	149	5.96	618	24.72

Sl. No.	Interventions	Unit	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.
	Yellow sticky trap															
30	AESA Based IPM in fruits and vegetables Light trap	Ha	0.08	All Blocks except B3	100	8.00	112	8.96	121	9.68	133	10.64	149	11.92	615	49.20
M	**Development of Farms, Nurseries and Parks**															
31	Developmental activities in new/ existing state Horticultural farm, Keelapalur	No	25	B3,B4,B8,B9	2	50.00	2	50.00	2	50.00	2	50.00	2	50.00	10	250.00
N	**Mechanization - Machineries, Equipments & Tools**															
32	Manual Sprayer-Knapsack/Foot operated Sprayer	Nos	0.12	All Blocks	23	2.76	20	2.40	27	3.24	27	3.24	36	4.32	133	15.96
33	Hand operated sprayer with face mask	Nos	0.025	B8	2	0.05	2	0.05	3	0.08	3	0.08	3	0.08	13	0.33
O	**Water / Irrigation Management**															
34	Micro Irrigation - Drip	Ha	1.12	All Blocks except B3,B4,B5	72	80.64	76.5	85.68	87	97.44	90	100.80	103	115.36	428.5	479.92
P	**Capacity Building**															
35	Training to farmers within the State. 2 days Rs.1000/farmer/day	No	0.02	All Blocks	275	5.50	285	5.70	290	5.80	320	6.40	325	6.50	1495	29.90
36	Training to farmers outside the state. 30 farmers/Batch	No	0.105	All Blocks except B1,B3,B5	235	24.68	260	27.30	280	29.40	295	30.98	293	30.77	1363	143.12

Sl. No.	Interventions	Unit	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.
37	Exposure visit to farmers for 5 days. Rs.1000/farmer/day	No	0.05	All Blocks except B1,B3,B5,B9	140	7.00	147	7.35	158	7.90	167	8.35	180	9.00	792	39.60
38	Training to farmers at HTC	No	0.0025	All Blocks except B1, B3, B4, B5,B9	90	0.23	120	0.30	145	0.36	165	0.41	180	0.45	700	1.75
39	Exposure visit of farmers outside India	No	4	B2,B6,B7,B8, B10,B11, B12, B13	10	40.00	10	40.00	11	44.00	11	44.00	13	52.00	55	220.00
40	Training to staff outside the state / Batch of 5 members	No	0.04	All Blocks except B1,B3,B4,B5, B9	9	0.36	10	0.40	10	0.40	10	0.40	10	0.40	49	1.96
41	Training to staff outside India	No	6	B2,B6,B7,B8, B10,B11, B12, B13	8	48.00	8	48.00	8	48.00	8	48.00	8	48.00	40	240.00
42	Computerization & governance	No	1	B8	0	0.00	0	0.00	1	1.00	0	0.00	0	0.00	1	1.00
43	Publicity and Documentation	No	0.5	B2,B6,B7,B8, B11,B13	70	35.00	80	40.00	90	45.00	100	50.00	117	58.50	457	228.50
Q	**Crop Insurance and Risk Mitigating schemes**															
44	Crop Insurance	Ha	0.025	B10	10	0.25	10	0.25	10	0.25	10	0.25	10	0.25	50	1.25
	Grand Total					**783.86**		**784.53**		**947.20**		**994.65**		**1021.29**		**4531.53**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5, Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.3. Agricultural Engineering

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

Strategies:

- ✓ Promotion and strengthening of Agricultural Mechanization through training, Testing and Demonstration in order to ensure performance testing of agricultural machinery and equipment, capacity building of farmers and end users and promoting farm mechanization through demonstrations.
- ✓ Demonstration, training and distribution of Post-harvest Technology and Management (PHTM) to popularize the technology for primary processing, value addition, low cost scientific storage/transport and the crop by-product management through demonstrations, capacity building of farmers and end users. Provides financial assistance for establishing PHT units.
- ✓ Promotion of ownership to small and marginal farmers for various agricultural machinery and equipment's such as Tractors, Power tillers, Rice transplanter, Self-propelled machinery, Tractor/Power tiller drawn equipments (MB Plough, Disc plough, Cultivator, Harrow, Leveller Blade, Ridger, Laser Land Leveller, Reversible Mechanical Plough, Rotavator, Rotopuddler, Reversible Hydraulic Plough, Post hole digger, Reaper, Seed driller, Balers, Coconut thrash cutter, coconut frond chopper, Multi crop thresher, Paddy thresher, Brush cutter, Chaff cutter, Drum Seeder) and Plant protection equipments.
- ✓ Provision of suitable financial assistance to establish farm machinery banks for custom hiring for appropriate locations and crops.
- ✓ Introduction of renewable energy in the villages which would replace other fuels. Also attractive for water pumping applications in remote areas. Hence solar operated

photovoltaic water pumping system provides better sustainable alternative option to fulfill irrigation requirement of agriculture.

- ✓ Strengthening of communication and information facilities in order to disseminate the information in rural areas.
- ✓ Awareness to be created towards the usage of Sugarcane infielder, Bird scarer, Mechanized row crop cultivation and Modernization of tractor workshop which indirectly increase the production.
- ✓ Promotion of agro-processing and management machinery at community level through supply of post-harvest machinery such as self-propelled/other driven horticultural machinery (Chain saw/ wheel barrow/ Mango grader/ planter and other suitable self-propelled machineries and equipments), Manual horticultural equipments (Aluminium ladder/ Ladder, Aluminium pole, Plucker), Post-harvest equipments for grains, oil seeds and Horticultural crops (Mini Rice mill, Mini Dhall mill, Millet Mill, Oil mill with filters, Extractor, pomegranate air extractor, Custard apple pulper, Dehydration unit, Pricking Machine, Humidifier, Packing machine, power driven dehusker, thresher, Harvester, De-spiking, Deconing, Peeler, Splitter, Stripper, Boiler, Steamer, Dryer solar, Washing Machine, Grinder, Pulveriser, Polisher, Cleaner cum grader, gradient separator, Specific gravity separator) this would make sure that more value is added to farm outputs locally.
- ✓ Establishment of Agricultural Engineering Extension centres in order to collect information related to Government subsidy on agricultural / machineries / equipment / irrigation systems etc., compilation of latest technologies related to Agricultural Engineering and Development of video cassettes library related to Processing of agricultural products, Working of important agricultural machines and equipment and repair, maintenance and proper setting of the different agricultural machines / and equipment.
- ✓ Promotion of training to AED engineers on post-harvest techniques and bio energy.

Expected outcome

Implementation of the above strategies such as supply of farm implements to carry out mechanised cultivation operations and demonstration to farmers the advantage of using Agricultural implements and machinery would increase the production and productivity. Post- Harvest Technologies to farmers would prevent loss of food grains during harvest and storage and Preserve the quality of produce in respect of perishable commodities. Disseminated technologies on renewable energies, in particular solar

energy for agricultural activities in respect of pumping with solar powered pumps, drying farm produce for enhancement of quality to fetch reasonable market price.

Budget

The overall budget requirement for implementation of above interventions is **₹. 16317.61 Lakhs**.

Implementing agency

The projects will be implemented by the Department of Agricultural Engineering.

Table 4.16. Budget Requirement for Agricultural Engineering

(₹. in lakhs)

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	**Capacity Building**															
2	Demonstration of Agricultural Machinery	All Blocks Except B3	No's/ Ha	0.04	30.00	1.20	30.00	1.20	30.00	1.20	30.00	1.20	30.00	1.20	150.00	6.00
3	Training of farmers	All Blocks	No's/ Ha	0.04	60.00	2.40	60.00	2.40	60.00	2.40	60.00	2.40	60.00	2.40	300.00	12.00
4	Training of Rural Youth in workshops	All Blocks Except B4,B3, B10, B11	No's/ Ha	0.04	10.00	0.40	10.00	0.40	10.00	0.40	10.00	0.40	10.00	0.40	50.00	2.00
5	Demonstration of Post Harvest Technologies	All Blocks Except B4 and B3	No's/ Ha	0.04	9.00	0.36	9.00	0.36	9.00	0.36	9.00	0.36	9.00	0.36	45.00	1.80
7	Financial assistance for Procurement of Agricultural Machinery and Equipment															
8	Tractor (8-15 PTO HP)	All Blocks	No's/ Ha	3.00	15.00	45.00	15.00	45.00	15.00	45.00	15.00	45.00	15.00	45.00	75.00	225.00
9	Tractor (15-20 PTO HP)	All Blocks	No's/ Ha	4.00	15.00	60.00	15.00	60.00	15.00	60.00	15.00	60.00	15.00	60.00	75.00	300.00
10	Tractor (Above 20-40 PTO HP)	All Blocks	No's/ Ha	6.00	30.00	180.00	30.00	180.00	30.00	180.00	30.00	180.00	30.00	180.00	150.00	900.00
11	Tractor (40-70 PTO HP)	All Blocks	No's/	8.50	45.00	382.50	45.00	382.50	45.00	382.50	45.00	382.50	45.00	382.50	225.00	1912.50

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
			Ha													
12	**Power Tillers**															
13	Power Tiller (below 8 BHP)	All Blocks	No's/ Ha	1.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	500.00	500.00
14	Power Tiller (8 BHP & above)	All Blocks	No's/ Ha	1.75	100.00	175.00	100.00	175.00	100.00	175.00	100.00	175.00	100.00	175.00	500.00	875.00
15	**Rice Transplanter**															
16	Self Propelled Rice Transplanter (4 rows)	All Blocks	No's/ Ha	2.50	6.00	15.00	6.00	15.00	6.00	15.00	6.00	15.00	6.00	15.00	30.00	75.00
17	Self Propelled Rice Transplanter (Above 4-8 rows)	All Blocks	No's/ Ha	16.00	2.00	32.00	2.00	32.00	2.00	32.00	2.00	32.00	2.00	32.00	10.00	160.00
18	**Self Propelled Machinery**															
19	Reaper cum Binder	All Blocks	No's/ Ha	3.00	3.00	9.00	3.00	9.00	3.00	9.00	3.00	9.00	3.00	9.00	15.00	45.00
20	**Specialized Self Propelled Machinery**															
21	Reaper	All Blocks	No's/ Ha	1.10	3.00	3.30	3.00	3.30	3.00	3.30	3.00	3.30	3.00	3.30	15.00	16.50
22	Post Hole Digger / Augur	All Blocks	No's/ Ha	0.63	3.00	1.89	3.00	1.89	3.00	1.89	3.00	1.89	3.00	1.89	15.00	9.45
23	**Tractor/Power Tiller (below 20 BHP) driven equipments**															
24	**a. Land Development, tillage and seed bed**															

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
	preparation equipments															
25	MB Plow	All Blocks	No's/ Ha	0.30	10.00	3.00	10.00	3.00	10.00	3.00	10.00	3.00	10.00	3.00	50.00	15.00
26	Disc Plow	All Blocks	No's/ Ha	0.30	10.00	3.00	10.00	3.00	10.00	3.00	10.00	3.00	10.00	3.00	50.00	15.00
27	Cultivator	All Blocks	No's/ Ha	0.20	10.00	2.00	10.00	2.00	10.00	2.00	10.00	2.00	10.00	2.00	50.00	10.00
28	Harrow	All Blocks	No's/ Ha	0.60	6.00	3.60	6.00	3.60	6.00	3.60	6.00	3.60	6.00	3.60	30.00	18.00
29	Leveler Blade	All Blocks	No's/ Ha	0.15	3.00	0.45	3.00	0.45	3.00	0.45	3.00	0.45	3.00	0.45	15.00	2.25
30	Ridger	All Blocks	No's/ Ha	0.25	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	15.00	3.75
31	Laser Land Leveller	All Blocks	No's/ Ha	3.40	3.00	10.20	3.00	10.20	3.00	10.20	3.00	10.20	3.00	10.20	15.00	51.00
32	Reversible Mechanical plough	All Blocks	No's/ Ha	0.50	3.00	1.50	3.00	1.50	3.00	1.50	3.00	1.50	3.00	1.50	15.00	7.50
33	Rotavator	All Blocks	No's/ Ha	0.35	10.00	3.50	10.00	3.50	10.00	3.50	10.00	3.50	10.00	3.50	50.00	17.50
34	Rotopuddler	All Blocks	No's/ Ha	1.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	15.00	15.00
35	Reversible Hydraulic plough	All Blocks	No's/ Ha	0.45	3.00	1.35	3.00	1.35	3.00	1.35	3.00	1.35	3.00	1.35	15.00	6.75
36	**b. Sowing Planting, Reaping and Digging Equipments:**															

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
37	Post Hole Digger	All Blocks	No's/ Ha	0.80	10.00	8.00	10.00	8.00	10.00	8.00	10.00	8.00	10.00	8.00	50.00	40.00
38	Tractor drawn reaper	All Blocks	No's/ Ha	0.95	10.00	9.50	10.00	9.50	10.00	9.50	10.00	9.50	10.00	9.50	50.00	47.50
39	Zero till seed cum fertilizer drill	All Blocks	No's/ Ha	0.50	10.00	5.00	10.00	5.00	10.00	5.00	10.00	5.00	10.00	5.00	50.00	25.00
40	Seed drill	All Blocks	No's/ Ha	0.40	3.00	1.20	3.00	1.20	3.00	1.20	3.00	1.20	3.00	1.20	15.00	6.00
41	**c. Intercultivation Equipments**															
42	Power Weeder (engine operated below 2 BHP)	All Blocks	No's/ Ha	0.25	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	15.00	3.75
43	**d. Equipment for residue management / hay and forage equipments**															
44	Sugarcane thrash Cutter	All Blocks	No's/ Ha	1.50	3.00	4.50	3.00	4.50	3.00	4.50	3.00	4.50	3.00	4.50	15.00	22.50
45	Coconut Frond chopper	All Blocks	No's/ Ha	0.80	3.00	2.40	3.00	2.40	3.00	2.40	3.00	2.40	3.00	2.40	15.00	12.00
46	Balers	All Blocks Except B3	No's/ Ha	2.90	3.00	8.70	3.00	8.70	3.00	8.70	3.00	8.70	3.00	8.70	15.00	43.50
47	**e. Harvesting and Threshing equipments**															
48	Multi crop Threshers	All Blocks	No's/	2.50	9.00	22.50	9.00	22.50	9.00	22.50	9.00	22.50	9.00	22.50	45.00	112.50

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
			Ha													
49	Paddy Thresher	All Blocks	No's/ Ha	1.60	3.00	4.80	3.00	4.80	3.00	4.80	3.00	4.80	3.00	4.80	15.00	24.00
50	Brush Cutter	All Blocks	No's/ Ha	0.25	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	15.00	3.75
51	**f. Chaff Cutter (Operated by engine / electric motor below 3 hp and by power tiller and tractor of below 20 BHP tractor)**	All Blocks	No's/ Ha	0.25	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	15.00	3.75
52	**Tractor (above 20-35 BHP) driven equipments**															
54	MB Plow	All Blocks	No's/ Ha	0.80	3.00	2.40	3.00	2.40	3.00	2.40	3.00	2.40	3.00	2.40	15.00	12.00
55	Disc Plow	All Blocks	No's/ Ha	0.40	3.00	1.20	3.00	1.20	3.00	1.20	3.00	1.20	3.00	1.20	15.00	6.00
56	Cultivator	All Blocks	No's/ Ha	0.25	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	15.00	3.75
57	Harrow	All Blocks	No's/ Ha	0.90	3.00	2.70	3.00	2.70	3.00	2.70	3.00	2.70	3.00	2.70	15.00	13.50
58	Leveler Blade	All Blocks	No's/ Ha	0.25	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	3.00	0.75	15.00	3.75
59	Ridger	All Blocks	No's/ Ha	0.30	3.00	0.90	3.00	0.90	3.00	0.90	3.00	0.90	3.00	0.90	15.00	4.50
60	Laser Land Leveller	All Blocks	No's/ Ha	3.60	3.00	10.80	3.00	10.80	3.00	10.80	3.00	10.80	3.00	10.80	15.00	54.00

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
61	Reversible Mechanical plough	All Blocks	No's/ Ha	0.65	3.00	1.95	3.00	1.95	3.00	1.95	3.00	1.95	3.00	1.95	15.00	9.75
62	Rotavator	All Blocks	No's/ Ha	0.80	3.00	2.40	3.00	2.40	3.00	2.40	3.00	2.40	3.00	2.40	15.00	12.00
63	Rotopuddler	All Blocks	No's/ Ha	1.20	3.00	3.60	3.00	3.60	3.00	3.60	3.00	3.60	3.00	3.60	15.00	18.00
64	Reversible Hydraulic plough	All Blocks	No's/ Ha	1.90	3.00	5.70	3.00	5.70	3.00	5.70	3.00	5.70	3.00	5.70	15.00	28.50
65	**b. Sowing, Planting, Reaping and Digging Equipments**															
66	Post Hole digger	All Blocks	No's/ Ha	0.90	3.00	2.70	3.00	2.70	3.00	2.70	3.00	2.70	3.00	2.70	15.00	13.50
67	Tractor drawn reaper	All Blocks	No's/ Ha	1.10	3.00	3.30	3.00	3.30	3.00	3.30	3.00	3.30	3.00	3.30	15.00	16.50
68	Zero till seed cum fertilizer drill	All Blocks	No's/ Ha	0.60	3.00	1.80	3.00	1.80	3.00	1.80	3.00	1.80	3.00	1.80	15.00	9.00
69	Seed drill	All Blocks	No's/ Ha	0.50	3.00	1.50	3.00	1.50	3.00	1.50	3.00	1.50	3.00	1.50	15.00	7.50
70	**d. Equipments for Residue management/Hay and Forage Equipments**															
71	Sugarcane thrash Cutter	All Blocks	No's/ Ha	1.75	3.00	5.25	3.00	5.25	3.00	5.25	3.00	5.25	3.00	5.25	15.00	26.25
72	Coconut Frond chopper	All Blocks	No's/ Ha	0.90	3.00	2.70	3.00	2.70	3.00	2.70	3.00	2.70	3.00	2.70	15.00	13.50

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
73	Balers	All Blocks	No's/ Ha	3.00	3.00	9.00	3.00	9.00	3.00	9.00	3.00	9.00	3.00	9.00	15.00	45.00
74	**e.Harvesting& Threshing Equipments**															
75	Multi crop Threshers	All Blocks	No's/ Ha	3.00	3.00	9.00	3.00	9.00	3.00	9.00	3.00	9.00	3.00	9.00	15.00	45.00
76	Paddy Thresher	All Blocks	No's/ Ha	1.90	3.00	5.70	3.00	5.70	3.00	5.70	3.00	5.70	3.00	5.70	15.00	28.50
77	Brush Cutter	All Blocks	No's/ Ha	0.30	3.00	0.90	3.00	0.90	3.00	0.90	3.00	0.90	3.00	0.90	15.00	4.50
78	**f.Chaff Cutter (Operated by engine / electric motor above 3-5 hp and by power tiller and tractor of below 35 BHP tractor)**	All Blocks	No's/ Ha	0.40	3.00	1.20	3.00	1.20	3.00	1.20	3.00	1.20	3.00	1.20	15.00	6.00
80	**a.Land Development, tillage and seed bed preparation equipments**															
81	MB Plow	All Blocks	No's/ Ha	1.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	500.00	500.00
82	Disc Plow	All Blocks	No's/ Ha	0.60	100.00	60.00	100.00	60.00	100.00	60.00	100.00	60.00	100.00	60.00	500.00	300.00
83	Cultivator	All Blocks	No's/ Ha	0.30	100.00	30.00	100.00	30.00	100.00	30.00	100.00	30.00	100.00	30.00	500.00	150.00
84	Harrow	All Blocks	No's/ Ha	1.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	10.00	50.00	50.00

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
85	Leveler Blade	All Blocks	No's/ Ha	0.30	10.00	3.00	10.00	3.00	10.00	3.00	10.00	3.00	10.00	3.00	50.00	15.00
86	Ridger	All Blocks	No's/ Ha	0.40	3.00	1.20	3.00	1.20	3.00	1.20	3.00	1.20	3.00	1.20	15.00	6.00
87	Reversible Mechanical plough	All Blocks	No's/ Ha	0.80	10.00	8.00	10.00	8.00	10.00	8.00	10.00	8.00	10.00	8.00	50.00	40.00
88	Laser Land Leveller	All Blocks	No's/ Ha	3.80	3.00	11.40	3.00	11.40	3.00	11.40	3.00	11.40	3.00	11.40	15.00	57.00
89	Rotavator	All Blocks	No's/ Ha	0.95	240.00	228.00	240.00	228.00	240.00	228.00	240.00	228.00	240.00	228.00	1200.00	1140.00
90	Rotopuddler	All Blocks	No's/ Ha	1.40	3.00	4.20	3.00	4.20	3.00	4.20	3.00	4.20	3.00	4.20	15.00	21.00
91	Reversible Hydraulic plough	All Blocks	No's/ Ha	2.00	3.00	6.00	3.00	6.00	3.00	6.00	3.00	6.00	3.00	6.00	15.00	30.00
92	**b. Sowing Planting, Reaping and Digging Equipments:**															
93	Zero till seed cum fertilizer drill	All Blocks	No's/ Ha	0.70	4.00	2.80	4.00	2.80	4.00	2.80	4.00	2.80	4.00	2.80	20.00	14.00
94	Tractor drawn reaper	All Blocks	No's/ Ha	1.25	4.00	5.00	4.00	5.00	4.00	5.00	4.00	5.00	4.00	5.00	20.00	25.00
95	Post Hole digger	All Blocks	No's/ Ha	1.05	1.00	1.05	1.00	1.05	1.00	1.05	1.00	1.05	1.00	1.05	5.00	5.25
96	Automatic Rice NurserySowing Machine	All Blocks	No's/ Ha	2.50	2.00	5.00	2.00	5.00	2.00	5.00	2.00	5.00	2.00	5.00	10.00	25.00
97	**d.Harvesting& Threshing**															

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
	Equipments															
98	Thresher/Multi Crop threshers	All Blocks	No's/ Ha	4.00	3.00	12.00	3.00	12.00	3.00	12.00	3.00	12.00	3.00	12.00	15.00	60.00
99	Paddy Thresher	All Blocks	No's/ Ha	2.20	3.00	6.60	3.00	6.60	3.00	6.60	3.00	6.60	3.00	6.60	15.00	33.00
100	**e.Equipments for Residue management/Hay and Forage Equipments**															
101	Sugarcane thrash Cutter	All Blocks	No's/ Ha	2.00	3.00	6.00	3.00	6.00	3.00	6.00	3.00	6.00	3.00	6.00	15.00	30.00
102	Coconut Frond chopper	All Blocks	No's/ Ha	1.05	3.00	3.15	3.00	3.15	3.00	3.15	3.00	3.15	3.00	3.15	15.00	15.75
103	Balers (Round)	All Blocks	No's/ Ha	3.50	3.00	10.50	3.00	10.50	3.00	10.50	3.00	10.50	3.00	10.50	15.00	52.50
104	Baler (Rectangular)	All Blocks	No's/ Ha	8.00	3.00	24.00	3.00	24.00	3.00	24.00	3.00	24.00	3.00	24.00	15.00	120.00
105	Sugarcane ratoon manager	All Blocks	No's/ Ha	1.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	3.00	15.00	15.00
106	**All Manual/animal drawn equipment/implements / Tools**															
107	Drum Seeder (Below 4 Row)	All Blocks	No's/ Ha	0.100	10.00	1.00	10.00	1.00	10.00	1.00	10.00	1.00	10.00	1.00	50.00	5.00
108	Drum Seeder (Above 4 Row)	All Blocks	No's/ Ha	0.150	10.00	1.50	10.00	1.50	10.00	1.50	10.00	1.50	10.00	1.50	50.00	7.50
109	Tree climber	All Blocks	No's/	0.07	3.00	0.21	3.00	0.21	3.00	0.21	3.00	0.21	3.00	0.21	15.00	1.05

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
			Ha													
110	**Plant protection equipments**															
111	Manual sprayer: Knapsack/foot operated sprayer	All Blocks	No's/ Ha	0.015	15.00	0.23	15.00	0.23	15.00	0.23	15.00	0.23	15.00	0.23	75.00	1.13
112	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity 8-12 lts)	All Blocks	No's/ Ha	0.060	20.00	1.20	20.00	1.20	20.00	1.20	20.00	1.20	20.00	1.20	100.00	6.00
113	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity above 12-16 lts)	All Blocks	No's/ Ha	0.080	20.00	1.60	20.00	1.60	20.00	1.60	20.00	1.60	20.00	1.60	100.00	8.00
114	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity above 16 lts)	All Blocks	No's/ Ha	0.10	50.00	5.00	50.00	5.00	50.00	5.00	50.00	5.00	50.00	5.00	250.00	25.00
115	**Establishment of Farm Machinery Banks for Custom Hiring**	All Blocks Except B1,B2,B4, B5,B3	No's/ Ha	28.00	6.00	168.00	6.00	168.00	6.00	168.00	6.00	168.00	6.00	168.00	30.00	840.00
116	**Promotion of Farm Mechanization in Selected Villages**	B3,B4,B9, B12, B13	No's/ Ha	11.50	3.00	34.50	3.00	34.50	3.00	34.50	3.00	34.50	3.00	34.50	15.00	172.50
117	**Financial assistance for promotion of Mechanized Farming operations**	B3,B4,B9, B12, B13	No's/ Ha	0.04	10.00	0.40	10.00	0.40	10.00	0.40	10.00	0.40	10.00	0.40	50.00	2.00
118	Purchase of Tractors for AED	All Blocks	No's/ Ha	8.00	6.00	48.00	6.00	48.00	6.00	48.00	6.00	48.00	6.00	48.00	30.00	240.00

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
119	Purchase of Tractor drawn implemnets for AED	All Blocks	No's/ Ha	0.50	12.00	6.00	12.00	6.00	12.00	6.00	12.00	6.00	12.00	6.00	60.00	30.00
120	Purchase of Bull Dozers for AED	All Blocks	No's/ Ha	80.00	3.00	240.00	3.00	240.00	3.00	240.00	3.00	240.00	3.00	240.00	15.00	1200.00
121	Purchase of Paddy Transplanter for AED	All Blocks	No's/ Ha	18.00	3.00	54.00	3.00	54.00	3.00	54.00	3.00	54.00	3.00	54.00	15.00	270.00
122	Purchase of Paddy combine Harvester for AED	All Blocks	No's/ Ha	17.00	3.00	51.00	3.00	51.00	3.00	51.00	3.00	51.00	3.00	51.00	15.00	255.00
123	Purchase of Balers for AED	All Blocks	No's/ Ha	4.50	3.00	13.50	3.00	13.50	3.00	13.50	3.00	13.50	3.00	13.50	15.00	67.50
124	Purchase of Multi Crop Thresher for AED	All Blocks	No's/ Ha	3.50	3.00	10.50	3.00	10.50	3.00	10.50	3.00	10.50	3.00	10.50	15.00	52.50
125	**Minor Irrigation Scheme**															
126	Purchase of Rotary Drill for AED	B3	No's/ Ha	72.00	1.00	72.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	72.00
127	Hammer cum Rotary Drill for AED	B3 and B9	No's/ Ha	150.00	2.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.00	300.00
128	Purchase of Air Compressor 750 cfm for AED	B3 and B9	No's/ Ha	25.00	3.00	75.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	75.00
129	Purchase of ResitivityMetres for AED	B3 and B9	No's/ Ha	3.00	1.00	3.00	0.00	0.00	0.00	0.00	1.00	3.00	0.00	0.00	2.00	6.00
	Solar Energy															
130	**5 hp**	All Blocks	No's/ Ha	3.75	40.00	150.00	50.00	187.50	50.00	187.50	50.00	187.50	50.00	187.50	240.00	900.00

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
131	**7.5 hp**	All Blocks	No's/ Ha	5.30	40.00	212.00	40.00	212.00	40.00	212.00	40.00	212.00	40.00	212.00	200.00	1060.00
132	**10 hp**	All Blocks	No's/ Ha	6.75	30.00	202.50	30.00	202.50	30.00	202.50	30.00	202.50	30.00	202.50	150.00	1012.50
133	**400-600sq.ft**	All Blocks	No's/ Ha	6.50	2.00	13.00	2.00	13.00	2.00	13.00	2.00	13.00	2.00	13.00	10.00	65.00
134	**Information Technology (IT) related items**															
135	Computer & its accessories	All Blocks	No's/ Ha	0.80	0.00	0.00	6.00	4.80	0.00	0.00	4.00	3.20	6.00	4.80	16.00	12.80
136	Tablet (Tab)	B3,B4,B9, B12, B13	No's/ Ha	0.25	0.00	0.00	2.00	0.50	0.00	0.00	2.00	0.50	2.00	0.50	6.00	1.50
137	Xerox machine	All Blocks	No's/ Ha	1.50	0.00	0.00	4.00	6.00	0.00	0.00	4.00	6.00	4.00	6.00	12.00	18.00
138	Server and software development	B3	No's/ Ha	30.00	0.00	0.00	1.00	30.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	30.00
139	Chain saw/ Wheel barrow/ Mango grader/ planter and other suitable self propelled machineries and equipments for horticulture Crops	All Blocks	No's/ Ha	1.00	0.00	0.00	5.00	5.00	0.00	0.00	5.00	5.00	5.00	5.00	15.00	15.00
140	**Post Harvest Equipments for food grains, oil seeds and Horticultural Equipments**															
141	Mini Rice Mill	B3	No's/ Ha	1.50	0.00	0.00	0.00	0.00	1.00	1.50	0.00	0.00	0.00	0.00	1.00	1.50
142	Mini Dal Mill	B3	No's/ Ha	1.70	0.00	0.00	0.00	0.00	1.00	1.70	0.00	0.00	0.00	0.00	1.00	1.70
143	Packing Machines (for all types of Horticulture / Food	B3	No's/ Ha	3.00	0.00	0.00	0.00	0.00	1.00	3.00	0.00	0.00	0.00	0.00	1.00	3.00

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
	grain / Oil seeds crop)															
144	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)	B3,B4,B9, B12, B13	No's/ Ha	1.20	0.00	0.00	5.00	6.00	0.00	0.00	1.00	1.20	0.00	0.00	6.00	7.20
145	All types of Boiler/ Steamer/ Dryer solar (for all type of Horticulture / Food grain / Oil seeds crop)	B3,B4,B9	No's/ Ha	2.00	0.00	0.00	2.00	4.00	1.00	2.00	0.00	0.00	0.00	0.00	3.00	6.00
146	**Construction of Agricultural Engineering Extension centres (AEECs)**	B3,B4,B9, B12, B13	No's/ Ha	75.00	0.00	0.00	1.00	75.00	2.00	150.00	1.00	75.00	1.00	75.00	5.00	375.00
147	Training of AED Engineers on " Agricultural Processing" and " Bio- Energy"	All Blocks	No's/ Ha	0.04	0.00	0.00	3.00	0.12	3.00	0.12	3.00	0.12	3.00	0.12	12.00	0.48
148	Reclamation of Problem(Alkaline & Saline) soils	All Blocks	No's/ Ha	0.60	350.00	210.00	100.00	60.00	100.00	60.00	150.00	90.00	200.00	120.00	900.00	540.00
	Total					**3600.49**		**3169.41**		**3196.31**		**3162.01**		**3189.41**		**16317.61**

Acharapakam-B1, Chithamur-B2, Chitlapakkam-B3, Kattankolathur-B4, Madhuranthagam-B5,Padappai-B6, Pavinjur-B7, Sirukaveripakkam-B8, Sriperumpudur-B9, Thirukazhukundram-B10, Thiruporur-B11, Uthiramerur-B12, Walajabad-B13

4.4. Agricultural Marketing

The Government is taking every effort to attain sustainable agricultural development by transforming agriculture into a commercial venture, by switching over to new scientific methods of cultivation so as to increase the productivity manifold. Besides, through value addition, processing and utilization of the marketing opportunities, the incremental output can be ensured. To further improve the marketing opportunities and to reduce the loss of agricultural produces, several measures have to be taken up by way of interventions like promotion of commodity groups and market information, strengthening of 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.

Project components

- Strengthening of Uzhavar Sandhai and Regulated Market through construction of compound wall in Sirukaverippakkam and Uthiramerur blocks
- Construction of drying yards I all blocks except Sriperumpudhur
- Upgradation of rural shandies and uzhavar shandiesin Sirukaverippakkam and Uthiramerur blocks
- Millets processing units in Chitamoor block
- Supply of groundnut harvester in Sirukaverippakkam and Madhuranthagam block
- Exposure visit (within state & outside state) for commodity group farmers to acquire value addition technologies in all the blocks

Budget

The district plan proposes an outlay of **₹1361.51Lakhs** over a period of five years for Kancheepuram district.

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 4.17. Budget for Strengthening of Agricultural Marketing and Agri-Business

(₹. in lakhs)

Sl. No.	Intervention	Unit	Unit cost	Blocks	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	Compound walls	Nos.	40	B1, B3	0	0.00	0	0.00	0	0.00	2	80.00	0	0.00	2	80.00
2	Drying Yard	Nos.	4.5	All Blocks except B13	0	0.00	5	22.50	3	13.50	6	27.00	5	22.50	19	85.50
3	Storage godown	Nos.	25	All Blocks except B5, B9, B10, B12, B13	7	175.00	4	100.00	1	150.00		0.00	10	250.00	22	675.00
4	Transaction Shed	Nos.	200	B3		0.00		0.00	1	200.00		0.00		0.00	1	200.00
5	Upgradation of Uzhavar Shadhais	Nos.	50	B1, B13	0	0.00	2	100.00	0	0.00	0	0.00	0	0.00	2	100.00
	Formation of FPO / Strengthening of Existing Commodity Groups															
7	FPO	Nos.	35	B1, B6, B11	0	0.00	3	105.00	0	0.00	0	0.00	0	0.00	3	105.00
8	Dunnage	1 Nos	0.07	All Blocks except B5, B9, B10, B12, B13	0	0.00	0	0.00	101	7.07	0	0.00	0	0.00	101	7.07
9	Electronic Digital Weighing Scale - 5 Kg	1 Nos	0.11	All Blocks	0	0.00	0	0.00	130	14.30	0	0.00	0	0.00	130	14.30
10	Plastic crates	Nos	0.005	All Blocks	0	0.00	0	0.00	3900	19.50	0	0.00	0	0.00	3900	19.50
11	Tarpaulin	Nos	0.07	All Blocks except B8, B12, B13	0	0.00	0	0.00	27	1.89	0	0.00	0	0.00	27	1.89
	Post Harvest Infrastructure and Machinaries															
12	Dhal processing Unit	Nos	5	B1, B4, B6, B11	0	0.00	4	20.00	0	0.00	0	0.00	0	0.00	4	20.00

Sl. No.	Intervention	Unit	Unit cost	Blocks	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
13	Groundnut decorticator (power)	1 No	1	B1, B4	0	0.00	2	2.00	0	0.00	0	0.00	0	0.00	2	2.00
14	Groundnut Harvestor	1 No	1.5	B1, B4	0	0.00	2	3.00	0	0.00	0	0.00	0	0.00	2	3.00
15	Millet processing unit	Nos.	3	B6		0.00	1	3.00		0.00		0.00		0.00	1	3.00
16	Mini combine harvester for paddy	Nos.	1	B1, B4, B11	0	0.00	3	3.00	0	0.00	0	0.00	0	0.00	3	3.00
	Capacity building Programme															
17	Exposure Visits - within state	Nos	0.5	All blocks	0	0.00	3	1.50	4	2.00	4	2.00	2	1.00	13	6.50
18	Exposure Visits - outside state - 3 days	Nos	1.5	All blocks	0	0.00	3	4.50	4	6.00	4	6.00	2	3.00	13	19.50
19	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	Nos	0.25	All blocks	13	3.25	13	3.25	13	3.25	13	3.25	13	3.25	65	16.25
	Total					**178.25**		**367.75**		**417.51**		**118.25**		**279.75**		**1361.51**

B1-Sirukaveripakkam, B2- Walajabad, B3-Uthiramerur, B4-Maduranthagam, B5-Acharapakkam, B6-Chithamoor, B7-Pavunjur, B8-Padappai, B9-Thiruporor, B10-Thirukalukundram, B11-Kattankolathur, B12-St. Thomas mount, B13-Sriperumpudur

4.5. Seed 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 Tamil Nadu 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 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, creation of 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, Thermo hydrometer, Digital Moisture meter, Microscope, Working table, Working Chair, and Miscellaneous are required.

- **Creation of infrastructure facilities in seed testing laboratories**

A laboratory may be a completely separate building, or a part of a larger building housing a department. Regardless of how this space need is met a minimum of 1500 sq. ft. of working space should be provided for the laboratory analyzing about 10000 samples annually. The space provided should be divided into general work areas. These may be completely separate rooms or they may be portions of the same room. The areas to be considered include sample receiving, preparation, purity analysis, germination, seed storage, tags, supplies, mailing, general storage and office with a main objective to occupy large number of samples.

- **Strengthening of communication and networking facilities**

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

Expected outcome

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

Budget

The overall budget requirement for implementation of above interventions is **₹ 31.72 Lakhs**.

Implementing agency

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

Table 4.18. Budget 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**															
	Blower, Conductivity meter, Dehuller/Scarifier, Dehumidifier Air Conditioner, Digital moisture meter, Tonnage, Fabricated display Racks, Geyser, Generator, Heater, Hot air oven, Humidifier, Incubator, Induction stove, Microscope, Moisture meter, Packing machine, R. O system, Sample racks, Seed Grinder, Sieve, Thermohydro meter, Trolley for carriages, Working chair, Working table and Miscellaneous	No's	13.36	All Blocks	1.00	13.36	0.00	0.00	1.00	13.36	0.00	0.00	0.00	0.00	2.00	26.72
II	**Strengthening of communication and networking facilities**															
	Computer accessories	No's	0.50	All Blocks	10.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.00	5.00
	Total					**18.36**		**0.00**		**13.36**		**0.00**		**0.00**		**31.72**

B1-Sirukaveripakkam, B2- Walajabad, B3-Uthiramerur, B4-Maduranthagam, B5-Acharapakkam, B6- Chithamoor, B7-Pavunjur, B8-Padappai, B9-Thiruporor, B10 -Thirukalukundram, B11-Kattankolathur, B12-St. Thomas mount, B13-Sriperumpudur

4.6. Animal Husbandry

Livestock have been an integral component of India's agricultural and rural economy since time immemorial, supplying energy for crop production in terms of draught power and organic manure, and in turn deriving their own energy requirements from crop by-products 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 per cent 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 per cent of world's buffaloes, 12.5 per cent cattle, 20.4 per cent small ruminants, 2.4 per cent camel, 1.4 per cent equine, 1.5 per cent pigs and 3.1 per cent poultry. In 2010-11, livestock generated outputs worth Rs. 2075 billion which comprised 4 per cent of the GDP and 26 per cent 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:

- ✓ Increasing the availability of fodder through field level interventions
- ✓ Increasing the availability of fodder by strengthening farm infrastructure
- ✓ Livestock breeding management
- ✓ Livestock health
- ✓ Improving the livestock productivity
- ✓ Improving the service delivery at veterinary institutions
- ✓ Enhancing livestock management
- ✓ 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 Gross Domestic Product. 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.

- Establishment of vermicomposting unit in all blocks
- Distribution of Azolla trays in all blocks
- Fodder plot development in all blocks
- Meichal land development in all blocks except in Maduranthagam, Acharapakkam and Thiruporor block
- Distribution of Silage bags for conservation of fodder crops in Madhuranthagam block

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 Animal Husbandry 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 centres where best practices can be disseminated to the farmers. The following infrastructure facilities will strengthen the fodder availability such as

- Establishment of vermicomposting unit in Madhuranthagam block

Livestock breeding management

Over the past few decades, imported exotic cow varieties have gain a boost in milk production in Tamil Nadu. Most of the cattle breeds are exotic. These breeds theoretically produce a lot of milk, but are not well-adapted to our conditions. About 69 per cent 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 outdate 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 Artificial Insemination 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

- CIDR in all blocks
- Establishment and distribution of sex-sorted semen facility in Walajabad, Pavinjur and Padappai blocks
- Establishment of Infrastructure facilities for sex-sorting facility in all blocks

Livestock health

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

- Upgradation of vaccine production facilities for bacteria and virus in Padappai block
- Procurement of vaccines, medicine, diagnostic kit in Sirukaverippakkam block

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 implemented. The intervention have been propose are

- Distribution of sheep, goat, buffalo in all the blocks except Madhuranthagam and Thiruporur block
- Establishment of modern poultry in Padappai block
- Integrated farming in all blocks

Improving the service delivery at veterinary institutions

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

- Deep freezer facility for storage of vaccines and medicines in all blocks
- Establishment of infrastructure facilities, disease diagnostic lab, mobile veterinary units, surgical theatres in all blocks
- Ambulance facilities for animals in Sirukaverippakkam blocks

Enhancing livestock management

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

- Animal identification and traceability in all blocks
- Conservation of indigenous breeds in all blocks

Capacity building

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

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

- Establishment of farmers training Centre at Sirukaverippakkam
- Conducting demonstrations camps and campaigns in all blocks
- Creating awareness of livestock management to the farmers through training programmes in all blocks

Budget

The major themes proposed in the plan for animal husbandry sector with a total budget out lay of **₹ 11880.72 Lakhs**

Implementing agency

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

Table 4.19. Budget requirement for Animal Husbandry

(₹. in lakhs)

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Increasing the Availability of Fodder through Field level Interventions															
1	Establishment of Vermicomposting unit (single bed)	Nos	0.05	All Blocks	115	5.75	115	5.75	115	5.75	115	5.75	115	5.75	575	28.75
2	Fodder production to the farmers by Hydrophonic methods	Nos	0.10	All Blocks	96	9.60	96	9.60	96	9.60	96	9.60	96	9.60	480	48.00
3	Distrbution of Azolla trays	Nos	0.03	All Blocks	183	10.98	183	10.98	183	10.98	183	10.98	183	10.98	915	54.90
4	Distribution of Silage bags for conservation of fodder crops	Nos	0.01	All Blocks except B4	78	0.39	79	0.40	79	0.40	79	0.40	78	0.39	393	1.97
5	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
6	Meikal land development (incl infrastructure development)	acre	6.00	All Blocks except B4, B5, B9	4	24.00	9	54.00	7	42.00	7	42.00	6	36.00	33	198.00
	Increasing the Availability of Fodder by Strengthening Farm Infrastructure															
13	Establishment of Vermicompost unit (10 beds) at Farms	Nos	4.00	B8	1	4.00	0	-	1	4.00	0	-	1	4.00	3	12.00
	Livestock Breeding Management															
25	CIDR (Controlled Internal Drug Release) for increasing Fertility in Cattle	Nos	0.01	All Blocks	7990	79.90	7990	79.90	7990	79.90	7990	79.90	7990	79.90	39950	399.50
26	Distribution of sex sorted semen to veterinary institution	Nos	0.02	B2, B7, B8	2	500.00	2	500.00	0	-	0	-	0	-	4	1,000.00

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
27	Establishment of Infrastructure facilities for sex-sorting facility	Nos	300.00	All Blocks	24	720.00	21	630.00	19	570.00	18	540.00	16	480.00	98	2,940.00
	Livestock Health															
34	Upgradation of Vaccine Production Faclities - Bacterial	Nos	50.00	B8	0	-	1	50.00	0	-	0	-	0	-	1	50.00
35	Upgradation of Vaccine Production Faclities - Viral	Nos	30.00	B8	0	-	0	-	1	30.00	0	-	0	-	1	30.00
36	Procurement of vaccines, medicines, diagnostic kits, reagents etc	Nos	1000.00	B1	1	1,000.00	0	-	0	-	0	-	0	-	1	1,000.00
	Improving the Livestock Productivity															
39	Distibution of Sheep/Goat units -semi intensive system	Nos	0.60	All Blocks except B4, B9	135	81.00	125	75.00	136	81.60	135	81.00	135	81.00	666	399.60
40	Distribution of Buffalo units(5 Buffaloes)	Nos	4.50	All Blocks except B4, B9	145	652.50	146	657.00	145	652.50	146	657.00	116	522.00	698	3,141.00
41	Integrated farming (Goat+Cattle+Fish+Agriculture /Horticulture)	Unit	2.00	All Blocks	5	10.00	5	10.00	5	10.00	5	10.00	5	10.00	25	50.00
42	Development of Native chicken farms	Farm	1.00	All Blocks	25	25.00	25	25.00	25	25.00	25	25.00	25	25.00	125	125.00
43	Establishment of disposal pits for poultry unit	Nos	1.00	All Blocks	25	25.00	25	25.00	25	25.00	25	25.00	25	25.00	125	125.00
47	Establishment of Modern Poultry Shed	Nos	25.00	B8	1	25.00	0	-	0	-	0	-	0	-	1	25.00
48	Establishment of Modern Hatchery Complex	Nos	300.00	B7	0	-	0	-	1	300.00	0	-	0	-	1	300.00

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
	Improving the Service Delivery at Veterinary Institutions															
55	Deep freezer facility for Storage of vaccines and Medicines	Nos	10.00	All Blocks	0	-	0	-	13	130.00	0	-	0	-	13	130.00
56	Establishment of Infrastructure facilities for Veterinary Institutions	Nos	30.00	0												
57	Establishment of Mobile Disease Diagnostic Labs	Nos	20.00	All Blocks except B4, B10, B11, B12 Chithamur	2	40.00	2	40.00	2	40.00	1	20.00	1	20.00	8	160.00
58	Establishment of Mobile Veterinary Units	Nos	10.00	All Blocks except B4, B10, B11, B12 Chithamur	4	40.00	2	20.00	2	20.00	0	-	0	-	8	80.00
59	Establishment of surgical theatres at veterinary institution	Nos	30.00	All Blocks	3	90.00	3	90.00	3	90.00	3	90.00	1	30.00	13	390.00
60	Providing solar lighting panels at veterinary institution	Nos	1.00	All Blocks	22	22.00	23	23.00	19	19.00	18	18.00	16	16.00	98	98.00
61	Package of Modern Veterinary Diagnostic Aids to Veterinary Institutions such as Computerised X rays, Ultrasound, Diathermy etc.	Nos	30.00	All Blocks	3	90.00	3	90.00	3	90.00	3	90.00	1	30.00	13	390.00
62	Establishment of Ambulance facility for animals	Nos	80.00	B1	1	80.00	1	80.00	0	-	0	-	0	-	2	160.00

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
	Livestock Management															
63	Animal Identification and Traceability	Unit of 1000 animal	0.10	All Blocks	300	30.00	30	3.00	30	3.00	30	3.00	30	3.00	420	42.00
64	Conservation of Indigenous breeds	Pack	10.00	All Blocks	1	10.00	1	10.00	1	10.00	1	10.00	1	10.00	5	50.00
	Capacity Building															
67	Establishment of Farmers training Centre	Nos	200.00	B1	0	-	1	200.00	0	-	0	-	0	-	1	200.00
68	Conducting Demonstrations, Camps and Campaigns	Nos	0.10	All Blocks	113	11.30	113	11.30	113	11.30	113	11.30	113	11.30	565	56.50
69	Creating awarness of livestock management to the farmers through Training Programmes	Nos	0.10	All Blocks	231	23.10	231	23.10	231	23.10	231	23.10	231	23.10	1155	115.50
	Grand Total					**3629.52**		**2743.03**		**2303.13**		**1762.03**		**1443.02**		**11880.72**

B1-Sirukaveripakkam, B2- Walajabad, B3-Uthiramerur, B4-Maduranthagam, B5-Acharapakkam, B6-Chithamoor, B7-Pavunjur, B8-Padappai,B9-Thiruporor, B10-Thirukalukundram, B11-Kattankolathur, B12-St. Thomas mount, B13-Sriperumpudur

4.7. Animal Science Research

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 centres where best practices can be disseminated to the farmers. The following infrastructure facilities will strengthen the fodder availability such as

- Animal ambulance in all the blocks
- Farm animal waste management centres in all the blocks
- Solar energy models in all the blocks
- Modernization of diary operations in all the blocks

Budget

The major themes proposed in the plan for animal science research with a total budget out lay of **₹.1158.00 Lakhs**

Implementing agency

The projects proposed will be implemented by TANUVAS.

Table 4.20. Budget requirement for Animal Science Research

(₹. 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	**Infrastructure and Assets**															
1	Animal Ambulance	All Blocks	No	125	1	125.00	1	125.00	1	125.00	1	125.00	1	125.00	5	625.00
2	Farm animal waste management	All Blocks	No	25	1	25.00	2	50.00	1	25.00	1	25.00	1	25.00	6	150.00
3	Solar energy models	All Blocks	No	50	1	50.00	0	0.00	1	50.00	0	0.00	1	50.00	3	150.00
4	Modernization of dairy operations	All Blocks	No	116.5	1	116.50	0	0.00	1	116.50	0	0.00	0	0.00	2	233.00
5	Methane mitigating strategies		Nos	81												
	Total					**316.50**		**175.00**		**316.50**		**150.00**		**200.00**		**1158.00**

B1-Sirukaveripakkam, B2- Walajabad, B3-Uthiramerur, B4-Maduranthagam, B5-Acharapakkam, B6-Chithamoor, B7-Pavunjur, B8-Padappai,B9-Thiruporor, B10-Thirukalukundram, B11-Kattankolathur, B12-St. Thomas mount, B13-Sriperumpudur

4.8. 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 per cent of the world's buffaloes and 20 per cent 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,

- ✓ Milk storage tanks of various capacities in all blocks
- ✓ Milk tankers in all blocks
- ✓ Milk pumps in all blocks
- ✓ Processing equipment's in all blocks
- ✓ Pasteurizers in all blocks

- ✓ Heaters and chillers in all blocks
- ✓ Washer and conveyors in all blocks
- ✓ Pipes and fittings in all blocks
- ✓ Cleaning equipment's in all blocks
- ✓ Electrical installations (UPS, generators, stabilizers, control panel) in all blocks

Enhancing milk production and milk processing units

The quality of animals is critical in determining its milk productivity and hence overall production. Currently, low productivity per animal hinders development of the dairy sector. Despite being the world's largest milk producer, India's productivity per animal is very low, at 987 kg per lactation, compared with the global average of 2038 kg per lactation. The low productivity is a result of ineffective cattle and buffalo breeding programmes, limited extension and management on dairy enterprise development, traditional feeding practices that are not based on scientific feeding methods, and limited availability and affordability of quality feed and fodder. Animal health and breeding services provision, veterinary infrastructure development and vaccinations are the responsibility of the state government. These services have traditionally been provided for free or at a very subsidized rate but in the past few years it has been payable. state livestock development agencies are being set up as autonomous bodies to offer services in animal breeding in the form of procurement, production and distribution of breeding inputs (such as semen and liquid nitrogen), training and promotional activities. Despite these initiatives, the availability of services remains limited and extension activities in dairy management are woefully lacking. Let to get a better improvement in milk production than before the following inputs have been suggested.

- ✓ Provision of veterinary medicine in all blocks
- ✓ Fodder development equipment and seed material in all blocks
- ✓ Milk testing equipment's in all blocks
- ✓ Equipment's for artificial insemination in all blocks
- ✓ Milk society buildings and cow shed in all blocks
- ✓ Cryogenic containers in all blocks
- ✓ Weighing machines in all blocks
- ✓ Computer accessories in all blocks

Capacity building

India is the largest milk producer in the world with an annual production of over 155.4 metric tonnes of milk, yet the sector faces numerous issues. One of the major challenges facing the dairy sector is the growing gap between milk supply and demand. Another major challenge arises from the fact that more than 92 per cent 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 on 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 interventions has been proposed.

- ✓ Training of personnel of MPCS, Union and federation in all blocks
- ✓ Infertility camps in all blocks

Marketing structures

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

- ✓ Parlour structure in all blocks
- ✓ Milk product storage cabinets in all blocks
- ✓ Product billing system in all blocks

Quality control

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

- ✓ Adulteration detection equipment’s in all blocks
- ✓ Milk testing equipment and laboratory in all blocks

Processing and value addition

While adding value to farm and livestock products before they reach the local and international market is one of the key aims of Vision 2030. Product diversification has become an important aspect of business strategy with reasons for this increased focus being increased profitability, reduction in risk, increasing competition, higher growth and more efficient resource allocation. Value addition in the dairy value chain is still a challenge in our country. Value addition has been hailed as one of the solutions to the perishability challenge of milk by converting it to a more durable form and hence reducing farm losses. But only few of them undertake the value addition In India. To maximize the value addition in rural areas the following interventions have been suggested

- ✓ Skim milk powder plantin all blocks
- ✓ Dairy processing plantsin all blocks
- ✓ Water and effluent treatment plantsin all blocks
- ✓ Steam raisning plantin all blocks
- ✓ Fat handling and other dairy equipment'sin 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 and skim milk powder plant in all blocks
2. BMC building in all blocks
3. Cattle feed plants in all blocks
4. Ware house for dairy products in all blocks
5. Ice cream manufacturing buildings in all blocks

Budget

An outlay of **₹.22270.25 lakhs** is proposed to fulfill the aforementioned interventions for five years. This foresighted implementation of developmental schemes in Dairy Sector has enabled to increase the per capita income of rural households in backward Districts.

Implementing agency

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

Table 4.21. Budget requirement for Dairy Development

(₹. in lakhs)

Sl. No	Components	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Electrical installation like Tranformemr, UPS, Stabilisers, Control Panel MCC etc.,	All blocks	1	25	1	25.00	0	0.00	1	25.00	0	0.00	1	25.00	3	75.00
2	Milk Storage Tanks of various capacities	All blocks	1	15	1	15.00	1	15.00	1	15.00	1	15.00	1	15.00	5	75.00
3	Tub washer, Canwashers, Crate conveyor systems.	All blocks	1	10	0	0.00	1	10.00	1	10.00	1	10.00	0	0.00	3	30.00
4	Point of Sale Machines and billing systems	All blocks	1	0.25	10	2.50	10	2.50	10	2.50	10	2.50	10	2.50	50	12.50
5	SS pipes and fittings	All blocks	1	5	1	5.00	1	5.00	1	5.00	1	5.00	1	5.00	5	25.00
6	Solar system for water heating	All blocks	1	2	1	2.00	0	0.00	0	0.00	1	2.00	1	2.00	3	6.00
7	Packing Machineries for milk, Butter, Ghee, SMP and Other Milk products	All blocks	1	18	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	All blocks	1	10	1	10.00	1	10.00	1	10.00	1	10.00	1	10.00	5	50.00
9	Milk Tankers of various	All blocks	1	25	0	0.00	2	50.00	2	50.00	0	0.00	0	0.00	4	100.00

Sl. No	Components	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
	capacities															
10	Milk Pumps of Vaious capacities	All blocks	1	0.5	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
11	Generator of various capacities	All blocks	1	20	1	20.00	0	0.00	0	0.00	0	0.00	1	20.00	2	40.00
12	Curd processing equipments	All blocks	1	50	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00
13	Cleaning In Place equipments with accessories	All blocks	1	75	0	0.00	0	0.00	1	75.00	0	0.00	0	0.00	1	75.00
	Enhancing milk production and processing units															
14	Veterinary Medicine	All blocks	1	2	3	6.00	3	6.00	4	8.00	4	8.00	5	10.00	19	38.00
15	Two wheeler for AI technician	All blocks	1	0.5	10	5.00	10	5.00	10	5.00	10	5.00	10	5.00	50	25.00
16	Computer system with accessories	All blocks	1	0.5	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
17	Fodder seed materials	All blocks	1	0.25	5	1.25	5	1.25	5	1.25	5	1.25	5	1.25	25	6.25
18	Fodder development equipments like chaff cutter, Mower etc.,	All blocks	1	0.2	10	2.00	10	2.00	10	2.00	10	2.00	10	2.00	50	10.00

Sl. No	Components	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
19	Bulk Milk coolers of Various capacities	All blocks	1	15	2	30.00	2	30.00	2	30.00	0	0.00	0	0.00	6	90.00
20	Milk cans	All blocks	1	0.035	500	17.50	500	17.50	500	17.50	500	17.50	500	17.50	2500	87.50
21	Electronic weighing scales of various capacities.	All blocks	1	0.3	10	3.00	10	3.00	10	3.00	10	3.00	10	3.00	50	15.00
22	Electronic milk testing equipments	All blocks	1	1.25	10	12.50	10	12.50	10	12.50	10	12.50	10	12.50	50	62.50
23	Milking machine	All blocks	1	0.8	5	4.00	5	4.00	5	4.00	5	4.00	5	4.00	25	20.00
24	Cow shed	All blocks	1	5	10	50.00	10	50.00	10	50.00	10	50.00	10	50.00	50	250.00
25	Society Buildings	All blocks	1	20	5	100.00	5	100.00	5	100.00	5	100.00	5	100.00	25	500.00
26	Cryogenic containers	All blocks	1	0.35	10	3.50	10	3.50	10	3.50	5	1.75	5	1.75	40	14.00
27	Equipments for Artificial Insemination	All blocks	1	0.5	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
	Capacity building															
28	Training of personnel of MPCS, Union and Federation.	All blocks	1	0.05	100	5.00	100	5.00	100	5.00	100	5.00	100	5.00	500	25.00
29	Infertility Camps	All blocks	1	0.2	25	5.00	25	5.00	25	5.00	25	5.00	25	5.00	125	25.00
	Marketing structres															

Sl. No	Components	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
30	Parlour structures	All blocks	1	5	5	25.00	5	25.00	5	25.00	5	25.00	5	25.00	25	125.00
31	Milk product storage cabinets	All blocks	1	0.3	100	30.00	100	30.00	50	15.00	30	9.00	30	9.00	310	93.00
32	Product Billing systems	All blocks	1	0.3	10	3.00	10	3.00	10	3.00	10	3.00	10	3.00	50	15.00
	Quality control															
33	Adulteration detection equipments	All blocks	1	4	1	4.00	1	4.00	1	4.00	1	4.00	1	4.00	5	20.00
34	Milk testing equipment and Laboratory.	All blocks	1	5	1	5.00	1	5.00	1	5.00	1	5.00	1	5.00	5	25.00
	Processing															
35	Skim Milk powder Plants	All blocks	1	6000	0	0.00	0	0.00	1	6000.00	0	0.00	0	0.00	1	6000.00
36	Dairy Processing Plants	All blocks	1	6000	0	0.00	0	0.00	1	6000.00	0	0.00	0	0.00	1	6000.00
37	Refrigeration Plants	All blocks	1	500	0	0.00	0	0.00	1	500.00	0	0.00	0	0.00	1	500.00
38	Water Treatment Plants. Reverse Osmosis plant	All blocks	1	100	0	0.00	1	100.00	1	100.00	0	0.00	0	0.00	2	200.00
39	Effluent treatment plant	All blocks	1	100	0	0.00	0	0.00	2	200.00	0	0.00	0	0.00	2	200.00
40	Steam raising plant with accessories	All blocks	1	100	0	0.00	0	0.00	2	200.00	0	0.00	0	0.00	2	200.00
41	Fat handling equipments	All blocks	1	200	0	0.00	0	0.00	2	400.00	1	200.00	0	0.00	3	600.00

Sl. No	Components	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
42	Dairy equipments	All blocks	1	50	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
	Development for dairy sector															
43	Construction of Dairy	All blocks	1	1500	0	0.00	1	1500.00	2	3000.00	0	0.00	0	0.00	3	4500.00
44	BMC buildings	All blocks	1	15	2	30.00	2	30.00	2	30.00	0	0.00	0	0.00	6	90.00
45	Ware house for Dairy products	All blocks	1	200	0	0.00	1	200.00	0	0.00	2	400.00	2	400.00	5	1000.00
46	Ware house for Dairy consumables	All blocks	1	200	0	0.00	0	0.00	1	200.00	0	0.00	2	400.00	3	600.00
	Grand Total					**514.75**		**2359.75**		**17196.75**		**981.00**		**1218.00**		**22270.25**

B1-Sirukaveripakkam, B2- Walajabad, B3-Uthiramerur, B4-Maduranthagam, B5-Acharapakkam, B6-Chithamoor, B7-Pavunjur, B8-Padappai, B9-Thiruporor, B10-Thirukalukundram, B11-Kattankolathur, B12-St. Thomas mount, B13-Sriperumpudur

4.9. Fisheries

As the human population continues to grow, finding means to feed those people is one of the most important challenges faced around the globe. Even in troubled economic times, men, women and children need to eat. A healthy diet, high in protein is necessary to ensure that growing population does not succumb to sickness and disease. Fish and other aquatic organisms fit the model for healthy sources of protein.

Indian fisheries and aquaculture is an important sector of food production, providing nutritional security to the food basket, contributing to the agricultural exports and engaging about fourteen million people in different activities. With diverse resources ranging from deep seas to lakes in the mountains and more than 10 per cent of the global biodiversity in terms of fish and shellfish species, the country has shown continuous and sustained increments in fish production since independence. Constituting about 6.3 per cent of the global fish production, the sector contributes to 1.1 per cent of the GDP and 5.15 per cent of the agricultural GDP. The total fish production of 10.07 million metric tonnes presently has nearly 65 per cent contribution from the inland sector and nearly the same from culture fisheries. Hence it's necessary to improve the fisheries development throughout the country.

Tremendous potential exists in India to augment fish production from freshwater aquaculture resources, which are spread across the length and breadth of the country. With concerted efforts to mobilize farmers to adopt fish farming, application of appropriate technologies for sustainable fish farming and fish seed production and availability of institutional finance, it would be possible to bring in substantial hikes in the annual fish production from the aquaculture sector within a span of 5 years. Hence in this district it suggested to implement the following intervention to enhance the production and growth of fisheries through increasing fishing efficiency of inland fishermen and fish farmers.

Aquatic plants growing in ponds and lakes are beneficial for fish and wildlife. They provide food, dissolved oxygen, and spawning and nesting habitat for fish and waterfowl. Aquatic plants can trap excessive nutrients and detoxify chemicals. However, dense growths (over 25 per cent of the surface area) of algae and other water plants can seriously interfere with pond recreation and threaten aquatic life. Water plants can restrict swimming, boating, fishing, and other water sports. Biological controls for aquatic vegetation have received considerable publicity. Several species of fish are herbivorous in that their principal diet is aquatic vegetation. One such species, the grass carp (also

known as the white amur or Chinese carp), is being tested in various parts of the country. Hence in this district it is suggested to implement the biological control of aquatic weeds by stocking of Grass Carps in Aquatic Weed Infested water bodies.

Inland fisheries (defined as inland capture plus aquaculture) is rapidly expanding and competing for natural resources with other uses. Consequently, there is an increasing need to monitor the sector to ensure responsible use of resources while increasing production.

Introduction of aquaculture in reservoirs/PWD & Panchayat Tanks, excavated ponds, promotion of cage farming in open water bodies, integrated aquaculture practice with agriculture & livestock and promotion of brackish water shrimp/fish culture are the few key opportunities available for aquaculture in Tamil Nadu.

Today cage culture is receiving more attention by both researchers and commercial producers. Factors such as increasing consumption of fish, declining stocks of wild fishes and poor farm economy has increased interest in fish production in cages. Many small or limited resource farmers are looking for alternatives to traditional agricultural crops. Aquaculture appears to be a rapidly expanding industry and it offer opportunities even on a small scale. Cage culture also offers the farmer a chance to utilize existing water resources in which most cases have only limited use for other purposes.

In addition to the popular inland fish varieties, the need for mass multiplication of new fish varieties/ ornamental varieties like Nile Tilapia was stressed and establishing Nile Tilapia hatchery by Government to ensure production and supply of quality seed was suggested. In the reservoirs, setting up of ‘Tilapia Parks’ can also be considered. In this regard, it was suggested that a comprehensive Leasing Policy shall be prepared and released.

These interventions includes,

- Biological Control of Aquatic Weeds by Stocking of Grass Carps in Aquatic Weed Infested water bodies in Thirukazhukundram and Porur block
- Enhancement of Fish production in irrigation tanks and panchayat tanks by stocking fish seeds in all the blocks except Kundrathur, Mount Thomas, Lathur and Chitamoor blocks
- Promotion of quality fish marketing by traditional fishers by providing moped with ice box

- Increasing safety at sea by providing life safety appliances
- Improvement of hygienic fish handling by providing ice boxes
- Increasing fish production in existing fish/shrimp farms by providing aerators and infrastructure
- Resource conservation in marine sector by promotion of fishing using passive gears
- Diversification of fishing by promoting squid jigging
- Resource enhancement by ranching of seeds in rivers and sea
- Introduction of short seasonal fish species in existing farm ponds
- Promotion of Ornamental fish culture in all blocks except Sirukaverippakkam block

Infrastructure and assets

Fish Farming is an age old activity and in practice from ancient times. The successful fish culture requires ploughing of pond, addition of manure, stocking of fish seed; eradication of unwanted aquatic plants and animals, watering the pond; harvesting the crop and marketing of the produce. The fish culture technologies and economics are simple and understandable to the fish farmers. Quality fish seed is the pre-requisite for successful fish farming. Department is using the techniques of hypophysation for the production of fish seed of culturable varieties. Brood stocks of required fish are maintained and sex-wise segregate is made two months before. The pairing is made and injected with calculated dose of pituitary gland or ovaprim, ovatide or ovpal is injected to male and female fish. Within the 6-8 hours of the injection eggs from female and sperm from male are released in the water. The fertilizer is external. Normally one kg fish releases about one lakh eggs. Hence it is necessary to construct the fish seed rearing centres and Establishment of gift farms and provision of inputs in this district. These interventions include,

- Establishment of district extension and training centres in kundrathur block

Capacity building programme

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. Promotion of innovation in application of information communication technology in fisheries and dissemination of knowledge plays a critical role in knowledge-

based growth. Therefore, it is imperative to update the professional skills of farmers and extension specialists in the latest knowledge and techniques in the field of their specialization to bring about the desired qualitative improvement and necessary orientation to contemporary problems to make research and education more relevant.

Farmers training programme is important to disseminate information about new technologies so that the farmer is able to make use of the latest agricultural developments. There also exists a gap between research findings and the needs of farmers. For technology to be successful, it is important that it should serve a useful purpose to the end user. The institution that bridges the gap between farmers and agricultural research scientists is the Agricultural Extension Service. This service works through an Agricultural Research System in the States.

Budget

The budget requirement for fulfilling the above interventions is **₹ 698.45 Lakhs**

Implementing agency

Department of Fisheries will be implementing the project

Table 4.22. Budget Requirement for Fisheries

(₹. 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	Resource enhancement by ranching of seeds in rivers and sea	No.	1	Thirukazhhukunram, Thiruporur, Thomas Malai, Lathur, Chithamur	0	0.00	10	10.00	10	10.00	10	10.00	10	10.00	40	40.00
2	Providing 50 % subsidy assistance to traditional fishermens of Cauvery waters for the purchase of Bamboo layered coracle	No.	0.00001	Thirukazhhukunram, Thiruporur, Thomas Malai, Lathur, Chithamur	0	0.00	1000000	10.00	1000000	10.00	1000000	10.00	1000000	10.00	4000000	40.00
3	Promotion of Ornamental fish culture	No.	0.5	Kancheepuram,SriPerumbudur, Kundrathur, Thirukazhhukunram, Kattankolathur, Thiruporur, Thomas Malai, Madurantakam, Lathur, Chithamur	0	0.00	50	25.00	40	20.00	50	25.00	60	30.00	200	100.00
4	Promotion of hygienic fish handling in fishing Harbours and fish landing centers	No.	3	Sri Perumbudur, Kundrathur, Kattankolathur, Thomas Malai	0	0.00	4	12.00	4	12.00	4	12.00	5	15.00	17	51.00
5	Introduction of IMC seeds in riverine check dams and weirs (ha.) (2000 AFL/ha. @Rs.2/seed- 100% subsidy)	Ha	0.79	All Blocks except Sri Perumbudur, Kundrathur, Kattankolathur, Thomas Malai, Chithamur	0	0.00	1	0.79	1	0.79	1	0.79	0	0.00	3	2.37
6	Increasing quality seed production through seed rearing in cages	No.	0.0175	Thirukazhhukunram, Thiruporur,ThomasMalai, Lathur, Chithamur	0	0.00	500	8.75	500	8.75	500	8.75	0	0.00	1500	26.25

Sl. No	Components	Unit	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
7	Increasing fish production in existing fish/shrimp farms by providing aerators and infrastructure	No.	0.15	Kancheepuram, Walajabad, Sri Perumbudur, Thirukazhhukunram, Kattankolathur	50	7.50	50	7.50	50	7.50	50	7.50	50	7.50	250	37.50
8	Increasing fish production in Tamil Nadu through production and distribution of genetically improved Tilapia	No.	3.34	Thirukazhhukunram, Kattankolathur, Thiruporur, Lathur, Chithamur	0	0.00	5	16.70	5	16.70	5	16.70	5	16.70	20	66.80
9	Improvement of Hygienic fish marketing by Establishing Modern Fish Market	No.	0.065	Thirukazhhukunram, Kattankolathur, Thiruporur, Thomas Malai, Lathur, Chithamur	0	0.00	200	13.00	200	13.00	200	13.00	200	13.00	800	52.00
10	Enhancement of Fish production in irrigation tanks and Panchayat tanks by stocking fish seeds	3.79	0	All Blocks except Kundrathur, Thomas Malai, Lathur, Chithamur	0	0.00	0	0.00	0	0.00	0	1.00	3.79	1.00	3.79	
11	Diversification of fishing by promoting squid jigging	Ha	0.04	Kancheepuram,Walajabad, Sri Perumbudur, Thirukazhhukunram, Kattankolathur	0	0.00	1000	40.00	1000	40.00	1000	40.00	1000	40.00	4000	160.00
12	Direct stocking of advanced fingerlings in irrigation tanks and panchayat tanks	No.	0.25	Thomas Malai	10	2.50		0.00		0.00	0	0.00	0	0.00	10	2.50
13	Biological Control of Aquatic Weeds by Stocking of Grass Carps in Aquatic Weed Infested water bodies	No.	5.363	Thirukazhhukunram, Thiruporur	5	26.82	5	26.82	0	0.00	0	0.00	0	0.00	10	53.63
14	Assistance for construction of	Ha	0.02	Kancheepuram,Walajabad, Uthiramerur,	500	10.00	100	2.00	100	2.00	100	2.00	100	2.00	900	18.00

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
	shrimp farms for DFFDA farmers			Sri Perumbudur, Kundrathur, Kattankolathur, Thomas Malai, Acharpakkam, Madurantakam												
	Creation of infrastructure facilities															
15	Establishment of fish culture ponds and provision of inputs	Ha	4.5	Kancheepura	2	9.00	0	0.00	0	0.00	0	0.00	0	0.00	2	9.00
16	**Infrastructure and Assets**															
17	Establishment of mini lab facilities in Government fish farms	No.	5	Kundrathur	0	0.00	1	5.00	0	0.00	0	0.00	0	0.00	1	5.00
	Capacity building programme															
18	Establishment of modern mobile fish marketing vehicles	No.	10	Kattankolathur, Thomas Malai	0	0.00	2	0.00	0	0.00	0	0.00	0	0.00	2	0.00
19	Exposure visit to farmers to other states		0.06	All Blocks	0	0.00	0	0.00	0	0.00	0	0.00	20	1.20	20	1.20
20	Providing trainers training and exposure visit to Departmental staff	No.	0.1	Thomas Malai		0.00	10	1.00	10	1.00	10	1.00	10	1.00	40	4.00
21	Training to fish farmers	No.	0.03	Thomas Malai	0	0.00	0	0.00	0	0.00	0	0.00	180	5.40	180	5.40
22	Creation of Marine infrastructure facilities for the fisher-folk of coastal towns and villages to enhance Marine fish production, hygienic handling of catch and	Nos	300	All Blocks	1	300	1	300	0	0	0	0	0	0	2	600

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
	prevention of Post harvest losses															
	Grand Total					**355.82**		**498.56**		**141.74**		**146.74**		**155.59**		**998.45**

B1-Sirukaveripakkam, B2- Walajabad, B3-Uthiramerur, B4-Maduranthagam, B5-Acharapakkam, B6-Chithamoor, B7-Pavunjur, B8-Padappai, B9-Thiruporor, B10-Thirukalukundram, B11-Kattankolathur, B12-St. Thomas mount, B13-Sriperumpudur

4.10. Fisheries Research

Kancheepuram District spreads over an area of 3,678 sq. km with 57.5 kms of coast line and 8104 ha area of inland water resources. The principal river of the district is the Pennar or the Ponnaiyar. The Gadilam River also flows through Kancheepuram District. A part of river Paravanar, also called Uppanar also flows through the district. Major irrigation and long seasonal tanks are spread in 5986 ha area. Veeranam Lake is considered as one of major water resources of the district. There are around 11,735 inland fishermen and a total of 28 Inland Fishermen Co-operative societies are functioning. Around 129 shrimp farms are registered in Coastal Aquaculture Authority. There are fish rearing centers and a number of shrimp aqua farms. A government fish seed farm was located in Lalpettai to supply the Indian Major Carp seeds. But the district does not have training centers exclusive for fisheries to guide the fish and shrimp farmers.

Considering the above, rich potential resources a fisheries training centre (FTC) could be created with the following facilities like a training hall, dormitory hall, wet training lab, etc. If the centre will be created it will help to expert and public for effectively transfer the technology and study the impact of the technology. Also this would help us to cater the needs of technology in the districts in order to redefine the technology transfer programmes for the future.

Project components

- Strengthening of farm infrastructure facilities in inland centres of TNFU in Kancheepuram block
- Development of snack foods from fish in Kancheepuram block
- Promotion of consumption of farmed Tilapia through product development and diversification in Kancheepuram block
- Development of ready to eat products from farmed freshwater fishes in Kancheepuram block
- Awareness to fishers on hygienic handling of fish in Kancheepuram block
- Creation of awareness among fishers on fish processing technologies in Kancheepuram block
- Capacity building and skill development programmes on fish processing technologies in Kancheepuram block
- Production of short films on nutritive value of fish and screening in theatres and television channels in Kancheepuram block

- Supply of preserved ready to eat and ready to cook fish products through public in Kancheepuram block
- Distribution systems in Kancheepuram block
- Supply chain management to promote consumption of farmed freshwater fishes in Kancheepuram block
- Installation of waste rendering plant at selected fishing harbours and fish markets in Kancheepuram block
- Development of fish compost for production of organic agricultural and horticultural crops in Kancheepuram block
- Design and development of e interface gadgets for sustainable aquaculture in Kancheepuram block
- Development of mobile gadgets/apps for remote monitoring system for aquaculture farms in Kancheepuram block
- Development of mobile apps for effective fishing in Kancheepuram block
- Design and development of handling devices/machines for fish processingin Kancheepuram block
- Design and development of solar powered tricycle for fish vendors in Kancheepuram block

Budget

The budget requirement for fulfilling the above interventions is **₹ 1976.43 Lakhs**

Expected outcome

The creation of infrastructure will enhance the quality of the research and it paves way for the state-of-art for the young researchers. The research and developmental activities is a continuous process, the innovative ideas that emerges from the young minds will help in identifying solutions to the field problem.

Implementing agency

The projects will be implemented by Tamil Nadu Fisheries University in the various colleges and research stations.

Table 4.23. Budget Requirement for Fisheries Research

(₹.in lakhs)

Sl. No	Interventions	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	**Aquaculture**														
i	**Inland Aquaculture**														
	Strengthening of farm infrastructure facilities in inland centres of TNFU	150	Kancheepuram	0	0.00	1	150.00	0	0.00	0	0.00	0	0.00	1	150.00
	Development of low cost feed using local agro waste	200	Kancheepuram	0	0.00	1	200.00	0	0.00	0	0.00	0	0.00	1	200.00
2	**Harvest and Post harvest**														
ii	**fish processing technology**														
a	**Value addition and fish product diversification**														
	Development of snack foods from fish	100	Kancheepuram	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
	Promotion of consumption of farmed Tilapia through product development and diversification	100	Kancheepuram	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	1	100.00
	Development of ready to eat products from farmed freshwater fishes	100	Kancheepuram	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
b	**Reduction of post harvest losses**														
	Awareness to fishers on hygienic handling of fish	0.005	Kancheepuram	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	Kancheepuram	25	15.00	25	15.00	25	15.00	25	15.00	25	15.00	125	75.00
	Capacity building and skill development	6.6	Kancheepuram	13	85.80	13	85.80	13	85.80	13	85.80	13	85.80	65	429.00

Sl. No	Interventions	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
	programmes on fish processing technologies														
c	**Enhancement of per capita consumption of fish**														
	Awareness campaign on health beneficial attributes of fish	0.005	Kancheepuram	52	0.26	52	0.26	52	0.26	52	0.26	52	0.26	260	1.30
	Production of short films on nutritive value of fish and screening in theatres and television channels	50	Kancheepuram	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00	1	50.00
d	**Ensuring nutritional security through fish and fishery products**														
	supply of preserved ready to eat and ready to cook fish products through public distribution systems	12.9	Kancheepuram	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	Kancheepuram	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	Kancheepuram	0	0.00	1	64.50	0	0.00	0	0.00	0	0.00	1	64.50
e	**Utilization of fish processing waste and by catch**														
	installation of waste rendering plant at selected fishing harbours and fish markets	130	Kancheepuram	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	Kancheepuram	0	0.00	1	65.00	0	0.00	0	0.00	0	0.00	1	65.00

Sl. No	Interventions	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
	Installation of unit for biogas from fish waste	161.5	Kancheepuram	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	Kancheepuram	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
3	**Fisheries Engineering**														
iii	**Aquaculture engineering**														
a	**Farm implements**														
	Design and development of e interface gadgets for sustainable aquaculture	20	Kancheepuram	0	0.00	1	20.00	0	0.00	0	0.00	0	0.00	1	20.00
b	**Renewable energy technologies**														
	Design and development of renewable energy powered aerators for aquaculture	35	Kancheepuram	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	Kancheepuram	0	0.00	0	0.00	0	0.00	1	50.00	0	0.00	1	50.00
c	**Automation technologies**		Kancheepuram												
	Development of mobile gadgets/apps for remote monitoring system for aquaculture farms	15	Kancheepuram	0	0.00	0	0.00	1	15.00	0	0.00	0	0.00	1	15.00
iii	**Navigation and Fisheries Engineering**														
	Development of cost effective gadgets for effective fishing	15	Kancheepuram	1	15.00	0	0.00	0	0.00	0	0.00	0	0.00	1	15.00
	Development of mobile	8	Kancheepuram	0	0.00	0	0.00	0	0.00	0	0.00	1	8.00	1	8.00

Sl. No	Interventions	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
	apps for effective fishing														
iii	**Post-harvest fisheries engineering**														
a	**Handling, transportation and storage**														
	Design and development of handling devices/machines for fish processing	50	Kancheepuram	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	Kancheepuram	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	Kancheepuram	0	0.00	0	0.00	0	0.00	1	20.00	0	0.00	1	20.00
	Grand total				**218.73**		**1205.53**		**168.73**		**273.73**		**109.73**		**1976.43**

4.11. Public Works Department

In Kancheepuram district, there are 709 Public Works Department tanks and 60 per cent paddy area comes under tank irrigation system. Most of the canals and tanks are silted and bushes like *Prosopis*, *Acassia* spp and water hyacinth occupied major part of the tanks and canals, there by storage capacity of the tank is very much reduced. To raise the water table level, subsurface dykes which are structures that intercept or obstruct the natural flow of groundwater and provide storage for water underground. Construction of check dams, subsurface dykes 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.

Project components

- ✓ Construction of Sub surface Dyke across the rivers
- ✓ Construction of check dams across the rivers (furnished in table)
- ✓ Modernisation of Irrigation in different blocks
- ✓ Supply of Exclusive Drinking water to Chembarambakkam tank from Palar river
- ✓ Construction of ANICUT across the PALAR river at different blocks

Budget

The budget requirement for fulfilling the above interventions is **₹. 26055.00 Lakhs**

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 Water Resources Development will be implementing the project.

Table 4.24 Budget Requirement for PWD **(₹. in lakhs)**

Sl. No.	Intervention	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Construction of Sub surface Dyke across the PALAR RIVER near Ullavur village in Walajabad Taluk & Kanchipuram District	Walajabad	Ha	17.76	90.11	1600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	90.11	1600.00
2	Construction of Sub surface Dyke using impervious soils (CLAY DYKE) across the VEGAVATHI RIVER near Kilkathirpur village in Kanchipuram Taluk.	Kancheepuram	Ha	0.77	52.10	40.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	52.10	40.00
3	Construction of Sub surface dyke across the Palar river near LN Puram village in Maduranthagam Taluk .	Maduranthagam	Ha	13.09	122.26	1600.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	122.26	1600.00
4	Construction of Check Dam across the Cheyyar River near Thirumukoodal Village in Walajabad taluk of Kanchipuram	Uthiramerur	Ha	9.06	110.36	1000.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	110.36	1000.00

Sl. No.	Intervention	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
	District															
5	Construction of check Dam across the Odai near Alapakkam in Kanchipuram District	Walajabad	Ha	1.99	40.21	80.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	40.21	80.00
6	Construction of Check Dam across the Kongarai - MampattuMaduvu in Acharapakkam Taluk & Kanchipuram District	Acharapakkam	Ha	0.59	169.41	100.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	169.41	100.00
7	Construction of Check Dam across Kiliyarodairiver in Maduranthagam Taluk.	Maduranthagam	Ha	9.12	0.00	0.00	38.36	350.00	0.00	0.00	0.00	0.00	0.00	0.00	38.36	350.00
8	Construction of Sub surface dyke across PALAR river near Pazhaveli village in Maduranthagam Taluk & Kanchipuram District	Maduranthagam	Ha	11.92	0.00	0.00	100.63	1200.00	0.00	0.00	0.00	0.00	0.00	0.00	100.63	1200.00
9	Construction of Sub surface Dyke across the CHEYYAR RIVER near	Uthiramerur	Ha	11.25	0.00	0.00	44.46	500.00	0.00	0.00	0.00	0.00	0.00	0.00	44.46	500.00

Sl. No.	Intervention	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
	Sethupattuvillage in Utiramerur Taluk & Kanchipuram District															
10	Construction of Sub surface Dyke across the PALAR RIVER near Poigainallur village in Cheyyur Taluk & Kanchipuram District	Lathur	Ha	13.61	0.00	0.00	110.18	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	110.18	1500.00
11	Construction of Sub surface dyke across the PALAR RIVER near Ozhalur village in Chenglepet Taluk & Kanchipuram District	Chengalpattu	Ha	13.33	0.00	0.00	120.06	1600.00	0.00	0.00	0.00	0.00	0.00	0.00	120.06	1600.00
12	Construction of Check dam across the Puthalimaduvu in Uthiramerur Taluk of Kanchipuram District.	Uthiramerur	Ha	1.36	0.00	0.00	110.16	150.00	0.00	0.00	0.00	0.00	0.00	0.00	110.16	150.00
13	Construction of Check Dam across Salavedumaduvu in Maduranthagam Taluk & Kanchipuram	Maduranthagam	Ha	11.26	0.00	0.00	0.00	0.00	44.40	500.00	0.00	0.00	0.00	0.00	44.40	500.00

Sl. No.	Intervention	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
	District															
14	Construction of Sub surface Dyke across the palar river near Perumbakkam village in Kanchipuram Taluk & District	Kancheepuram	Ha	14.99	0.00	0.00	0.00	0.00	80.06	1200.00	0.00	0.00	0.00	0.00	80.06	1200.00
15	Construction of Check Dam across Pazhayanurmadu vu near Pazhayanur village in Maduranthagam Taluk &Kanchipuram District	Maduranthag am	Ha	0.41	0.00	0.00	0.00	0.00	120.65	50.00	0.00	0.00	0.00	0.00	120.65	50.00
16	Construction of Sub surface dyke across palar river joining Cheyyar River near Palayaseevaram village in Kanchipuram Taluk & District	Walajabad	Ha	16.88	0.00	0.00	0.00	0.00	130.36	2200.00	0.00	0.00	0.00	0.00	130.36	2200.00
17	Construction of Sub surface Dyke using impervious soils (clay dyke) across the vegavathi RIVER a Tributary of	Kancheepuram	Ha	2.34	0.00	0.00	0.00	0.00	32.10	75.00	0.00	0.00	0.00	0.00	32.10	75.00

Sl. No.	Intervention	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
	Palar river near Villivalam village in Kanchipuram															
18	Construction of Sub surface Dyke across the PALAR RIVER near Edayathur village in Thirukazhukundram Taluk.	Thirukazhukundram	Ha	15.36	0.00	0.00	0.00	0.00	78.10	1200.00	0.00	0.00	0.00	0.00	78.10	1200.00
19	Construction of Sub surface Dyke across the PALAR RIVER near Nelvoy village in Cheyyur Taluk .	Lathur	Ha	24.05	0.00	0.00	0.00	0.00	62.36	1500.00	0.00	0.00	0.00	0.00	62.36	1500.00
20	Construction of check Dam across cheyyar river near Pullambakkam village in Uthiramerur Taluk .	Uthiramerur	Ha	26.60	0.00	0.00	0.00	0.00	0.00	0.00	30.08	800.00	0.00	0.00	30.08	800.00
21	Modernisation of Irrigation Arumbuliyur Tank for optimal use of water in Uthiramerur Taluk .	Uthiramerur	Ha	0.93	0.00	0.00	0.00	0.00	0.00	0.00	430.59	400.00	0.00	0.00	430.59	400.00

Sl. No.	Intervention	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
22	Construction of check Dam across Kuthiraikalmaduvu near Singadivakkam village in Kanchipuram Taluk	Walajabad	Ha	2.68	0.00	0.00	0.00	0.00	0.00	0.00	22.36	60.00	0.00	0.00	22.36	60.00
23	Construction of a Check Dam across Adayar river near Anakaputhur village in Alandur Taluk of Kanchipuram District.	Alandur	Ha	33.37	0.00	0.00	0.00	0.00	0.00	0.00	20.23	675.00	0.00	0.00	20.23	675.00
24	Construction of a Check Dam across Adayar river near Polichalur village in Alandur Taluk	Alandur	Ha	36.99	0.00	0.00	0.00	0.00	0.00	0.00	18.25	675.00	0.00	0.00	18.25	675.00
25	Construction of a Check Dam across Adayar river near Cowl Bazaar in Alandur Taluk	Alandur	Ha	37.50	0.00	0.00	0.00	0.00	0.00	0.00	18.00	675.00	0.00	0.00	18.00	675.00
26	Construction of a Check Dam across Adayar river near Thiruneermalai in Alandur Taluk	Alandur	Ha	43.21	0.00	0.00	0.00	0.00	0.00	0.00	15.62	675.00	0.00	0.00	15.62	675.00

Sl. No.	Intervention	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
27	Modernisation of Irrigation Enadhur Tank for optimal use of water in Kanchipuram Taluk .	Kancheepuram	Ha	1.39	0.00	0.00	0.00	0.00	0.00	0.00	574.67	800.00	0.00	0.00	574.67	800.00
28	Modernisation of Irrigation Pillaipakkam Tank for optimal use of water in Sriperumbudur Taluk .	Sriperumbudur	Ha	2.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	443.93	1200.00	443.93	1200.00
29	Construction of anicut across the Orathur Maduvu in Kanchipuram District	Kundrathur	Ha	2.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	77.71	200.00	77.71	200.00
30	Modernisation of Irrigation Vallam Hissa Tank for optimal use of water in Sriperumbudur Taluk.	Sriperumbudur	Ha	2.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	312.02	750.00	312.02	750.00
31	Modernisation of Irrigation Manimangalam Tank for optimal use of water in Sriperumbudur Taluk .	Kundrathur	Ha	1.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	842.00	1000.00	842.00	1000.00
32	Modernisation of Irrigation Pondur Big Tank for optimal use of water in Sriperumbudur	Sriperumbudur	Ha	11.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	43.30	500.00	43.30	500.00

Sl. No.	Intervention	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
33	Modernisation of Irrigation Sriperumbudur Tank for optimal use of water in Sriperumbudur Taluk.	Sriperumbudur	Ha	2.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	575.89	1200.00	575.89	1200.00
	Total					**4420.00**		**5300.00**		**6725.00**		**4760.00**		**4850.00**		**26055.00**

4.12. Cooperatives

Agricultural cooperatives or farmers' cooperatives are cooperatives where farmers pool their resources for mutual economic benefit. Agricultural cooperatives are broadly divided into agricultural service cooperatives, which provide various services to their individual farming members, and agricultural production cooperatives, where production resources such as land or machinery are pooled and members farm jointly. Agricultural supply cooperatives aggregate purchases, storage, and distribution of farm inputs for their members. By taking advantage of volume discounts and utilizing other economies of scale, supply cooperatives bring down members' costs. Supply cooperatives may provide seeds, fertilizers, chemicals, fuel, and farm machinery. Some supply cooperatives also operate machinery pools that provide mechanical field services (*e.g.,* ploughing, harvesting) to their members. Agricultural marketing cooperatives are often formed to promote specific commodities.

Project components

- Construction of compound wall in all blocks
- Office Building Renovation in Walajabad, Madhuranthagam and Pavinjur blocks
- Godown Renovation in Sirukaverippakkam, Walajabad, Madhuranthagam and Acharappakkam

Budget

The budget requirement for fulfilling the above interventions is **₹. 1173.24 Lakhs**

Expected outcome

Agricultural marketing cooperatives will provide the services involved in moving a product from the point of production to the point of consumption. Agricultural marketing includes a series of interconnected activities involving planning production, growing and harvesting, grading, packing, transport, storage, food processing, distribution and sale.

Implementing agency

Department of Cooperative Societies will be implementing the project.

Table 4.25 Budget Requirement for Civil supplies and Cooperatives

(₹.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	All blocks	23	184.54	23	157.10	21	153.01	24	144.70	21	175.77	112	815.12
2	Renovation of Godown	All blocks except B1, B2, B4, B5	8	49.32	5	29.50	5	27.60	4	30.00	5	22.00	27	158.42
3	Renovation of Office Building	All blocks except B2, B4, B7	9	73.30	6	32.90	4	24.00	7	33.50	6	21.00	32	184.70
4	Strong Room construction	B8, B9	1	10.00	0	0.00	0	0.00	0	0.00	1	5.00	2	15.00
	Total			**317.16**		**219.50**		**204.61**		**208.20**		**223.77**		**1173.24**

B1-Sirukaveripakkam, B2- Walajabad, B3-Uthiramerur, B4-Maduranthagam, B5-Acharapakkam, B6-Chithamoor, B7-Pavunjur, B8-Padappai,B9-Thiruporor, B10-Thirukalukundram, B11-Kattankolathur, B12-St. Thomas mount, B13-Sriperumpudur

Table 4.26 Consolidated Budget for Kancheepuram District

(₹. in lakhs)

Sl. No.	Sectors	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	1060.91	6615.81	5993.14	6125.69	5657.13	25452.64
2	Agricultural Research	0.00	0.00	0.00	0.00	0.00	0.00
3	Horticulture	783.86	784.53	947.20	994.65	1021.29	4531.53
4	Agricultural Engineering	3600.49	3169.41	3196.31	3162.01	3189.41	16317.63
5	Agricultural Marketing	178.25	367.75	417.51	118.25	279.75	1361.51
6	Seed Certification and Organic Certification	18.36	0.00	13.36	0.00	0.00	31.72
7	Animal Husbandry	3629.52	2743.03	2303.13	1762.03	1443.02	11880.72
8	Animal Sciences Research (TANUVAS)	316.50	175.00	316.50	150.00	200.00	1158.00
9	Dairy Development	514.75	2359.75	17196.75	981.00	1218.00	22270.25
10	Fisheries	355.82	498.56	141.74	146.74	155.59	998.45
11	Fisheries Research (TNFU)	218.73	1205.53	168.73	273.73	109.73	1976.45
12	Public Welfare Department (WRO)	4420.00	5300.00	6725.00	4760.00	4850.00	26055.00
13	Civil supplies & Cooperatives	317.16	219.50	204.61	208.20	223.77	1173.24
	Total	**15414.35**	**23438.87**	**37623.98**	**18682.30**	**18347.69**	**113207.14**

The total budget requirement for the implementation of various interventions by different departments in Kancheepuram district is **₹. 113207.14 Lakhs.**


KARNATAKA
KERALA
SRI LANKA