



NATIONAL AGRICULTURE DEVELOPMENT PROGRAMME (NADP)



DISTRICT AGRICULTURE PLAN

TIRUNELVELI



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



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2017

CONTENTS

Chapter No.	Particulars	Page. No
	Executive Summary	
I	Introduction	1
II	Profile of the blocks and district	5
III	Development of agriculture and allied sectors	22
IV	Block and district level plan	48

LIST OF TABLES

Table No.	Particulars	Page. No.
2.1	Administrative structure	7
2.2	Demographic details of the district	8
2.3	Soil type of all blocks	9
2.4	Month wise / season wise rainfall distribution in Tirunelveli district	10
2.5	Land use pattern	11
2.6	Block wise number of operational land holdings in Tirunelveli district	13
2.7	Area under major crops	15
2.8	Livestock population in the district	15
2.9	Area irrigated by different sources of water supply and growth rates	16
2.10	Irrigation by different sources in Tirunelveli district	16
2.11	Consumption of chemical fertilisers and pesticides	17
2.12	Agricultural machineries and implements	17
2.13	Regulated markets	18
2.14	Cold storage details	19
2.15	Banking and insurance details	19
2.16	Insurance scheme (2014-15)	20
2.17	Crop insurance scheme (2014-15)	20
2.18	Co-operation societies	21
3.1	Area production and yield of major crops in Tirunelveli district	22
3.2	Compound Growth Rates (CGR) of area, production and productivity under major crops in Tirunelveli district	23
3.3	Projected area, production, productivity	23
3.4	Projected area, production, productivity of horticulture crops	24
3.5	Yield Gap Analysis	25
3.6	Yield Gap Analysis for blackgram	28
3.7	Yield Gap Analysis for maize	31
3.8	Yield Gap Analysis for greengram	33
3.9	Yield Gap Analysis for sugarcane	36
3.10	Yield Gap Analysis for banana	38
3.11	Yield Gap Analysis for mango	41
3.12	Yield Gap Analysis for cashew	44

Table No.	Particulars	Page. No.
3.13	Projected area, production and yield for the major potential crops identified	46
4.1	Project cost for paddy cultivation	50
4.2	Project cost for millet cultivation	53
4.3	Project cost for pulses cultivation	55
4.4	Project cost for oilseeds cultivation	58
4.5	Project cost for oilpalm cultivation	62
4.6	Project cost for cotton cultivation	64
4.7	Project cost for sugarcane cultivation	66
4.8	Project cost for coconut cultivation	68
4.9	Project cost for research training	70
4.10	Budget requirement for infrastructure	74
4.11	Budget requirement for soil health management	76
4.12	Budget requirement for rainfed area development	78
4.13	Component wise Budget for State Seed Farm	80
4.14	Budget requirement for interventions in machineries	82
4.15	Budget requirement for interventions in IT	84
4.16	Budget abstract for agriculture sector	85
4.17	Budget requirement for agricultural research infrastructure	88
4.18	Project cost for horticulture	99
4.19	Project cost for agricultural engineering	112
4.20	Project cost for agricultural marketing	123
4.21	Project cost for seed certification	127
4.22	Project cost for animal husbandry	134
4.23	Project cost for animal science research	142
4.24	Project cost for dairy development	147
4.25	Budget abstract for fisheries	154
4.26	Budget abstract for fisheries research	157
4.27	Project cost for public works department	162
4.28	Project cost for cooperation	168
4.29	Budget abstract for Tirunelveli district	171

LIST OF FIGURES

Figure No.	Particulars	Page. No
1	Brief profile Tirunelveli district	6
2	Blocks in Tirunelveli district	7
3	Season wise average rainfall (2000-2012)	11

EXECUTIVE SUMMARY

Tirunelveli District was formed in 1790 by the East India Company, later came under the direct control of the British Crown Queen Victoria. The name Tirunelveli has been composed from the three Tamil words i.e., Thiru – Nel – Veli" meaning Sacred Paddy Hedge.

Tirunelveli District having geographical area of 6759 sq.kms, in the Southern eastern portion of Tamil Nadu is triangular in shape. It lies between 8°.05" and 9°.30" of the Northern latitude and 77°.05" and 78°.25" of Eastern longitude.

The district is located in the southern part of Tamil Nadu and surrounded by Virudhunagar District on the north, Western Ghats on the west, Kanyakumari District on the south and Tuticorin District on the east. The lifeline of the district is river Tamiraparani which feeds the district and quenches the thirst of residents of Tirunelveli and Tuticorin districts. The District has 3 Revenue Divisions consisting of 11 Taluks, 60 Firkas 19 Development Blocks, 616 Revenue Villages and 425 Village Panchayats.

Tirunelveli district is provided with varied agro climatic conditions ranging from extreme tropical to subtropical. The important food crops are Paddy, Cholam, Ragi, Cumbu and other minor millets. The commercial crops grown are Cotton, Chillies, Sugarcane and Groundnut.

Major Interventions in the Department of Agriculture

- SRI cultivation in paddy
- Promoting IPM and INM in rice cultivation
- Farm mechanization
- Supply of quality certified seeds at nominal cost
- Distribution of green manure seeds
- Distribution of Micro Nutrient Mixture
- Training in improved production technologies
- Training in nutrient management
- Training in management of pest and diseases.
- Organic farming

Major Interventions in the Department of Horticulture

- Precision farming
- Supply of hybrid seeds
- Plastic crates for vegetable handling and transport
- Supply of Banana bunch cover
- Supply of Banana pseudo stem injector
- Exposure visits
- High density planting
- Shade net cultivation
- Training on improved production technologies
- Training on value added products
- Training on Integrated Nutrient Management
- Training on integrated pest management
- Organic farming
- Protected cultivation techniques

Major Interventions in the Department of Agricultural Engineering

- Introduction of newly developed agricultural machinery / Implements
- Water harvesting structures
- Popularization of agricultural mechanization through conventional machinery / equipments
- Soil conservation works
- Distribution of machineries at subsidy
- Hiring of machineries
- Training rural youth on farm machineries

Major Interventions in the Department of Agricultural Marketing

- Market led extension
- Commodity group formation
- Market Intelligence
- Exposure visit to markets
- Arrangement of buyer seller meetings
- Establishing more regulated markets

- Popularizing regulated markets
- Farmer Producer Organizations
- Training on value added products
- Establishment of drying yards
- Establishing storage sheds

Major Interventions in Seed Certification

- Training on improved seed production technologies
- Establishment of seed processing units
- Storage facility in Seed Production Units
- Seed village

Major Interventions in the Department of Animal husbandry

- Fodder development activities
- Commercial fodder cultivation
- Fodder seed distribution
- Supply of mineral mixture to dairy cows
- Strengthening of veterinary institutions with basic facilities like fencing, bore-wells, water troughs etc.,
- Training on dairy and desi goat rearing
- Animal health campaign

Major Interventions in the Department of Fisheries

- Introduction of fresh fingerlings in ponds and lakes of the district
- Removing the aquatic weeds in the ponds
- Providing the required facilities to get better prices for fishermen
- Direct stocking of advanced fingerlings in irrigation tanks and panchayat tanks
- Encouraging fish culture in ponds
- Promotion of quality fish marketing facilities for traditional fisherman
- Increasing quality of fish seed production
- Promoting cage fish farming
- Promoting ornamental fish farms
- Hygienic fish handling

Consolidated Budget for Tirunelveli District**(₹. in lakhs)**

Sl. No	Components	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	3175.73	3532.52	4009.22	3326.06	2642.82	16686.35
2	Agricultural Research (TNAU)	160.00	20.00	35.00	10.00	0.00	225.00
3	Horticulture	3751.37	3757.79	3724.45	3693.83	3765.78	18693.22
4	Agricultural Engineering	990.36	1670.55	1694.10	793.88	850.41	5999.30
5	Agricultural Marketing	2128.65	929.34	247.40	112.60	118.60	3536.59
6	Seed Certification & Organic Certification	23.36	14.36	1.00	1.00	1.00	40.72
7	Animal Husbandry	2429.09	2113.00	2571.24	1079.14	2030.49	10222.96
8	Animal Science Research (TANUVAS)	1140.90	1290.90	632.90	482.90	266.50	3814.10
9	Dairy Development	1139.00	2164.00	7089.00	1089.00	1074.00	12555.00
10	Fisheries	1223.00	48.00	48.00	48.00	65.50	1432.50
11	Fisheries Research (TNFU)	418.73	900.53	468.73	123.73	109.73	2021.45
12	Water Resource Organization (PWD)	25.00	107.00	30.00	45.00	194.00	401.00
13	Civil Supplies & Co-Operation	535.29	379.96	516.84	256.25	187.87	1876.21
	Grand total	17140.48	16927.95	21067.88	11061.39	11306.70	77504.40

The total budget requirement for the implementation of various interventions by different departments in Tirunelveli district is **₹. 77504.40 Lakhs.**

CHAPTER I

INTRODUCTION

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

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

Objectives of RKVY

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

District and State Agriculture Plans

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

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

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

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

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

The Process

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

Revision and Updation of DAP and SAP in Tamil Nadu

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

Methodology followed

The revision of the District Agricultural Plan of Tirunelveli district, was done by gathering the secondary data about district and block with respect to rainfall, land use pattern, demography, livestock, machinery, infrastructure so far created etc. In addition, the constraints in production and marketing of agricultural and livestock produce, crop/animal production and gaps between expected and actual yield and the reasons for such gaps were

also discussed among the various stakeholders and incorporated in this plan document. Besides, in consultation with the line department officials and based on the data received from respective districts, a detailed year-wise action plan i.e. from 2017-18 to 2021-22 with physical and financial implications were presented.

CHAPTER II

PROFILE OF THE DISTRICT

In this chapter, the following details are discussed elaborately

- 2.1 Tirunelveli district at glance
- 2.2 Area, Location and Geographical features
- 2.3 Administrative structure of Tirunelveli district
- 2.4 Demographic profile
- 2.5 Topography
- 2.6 Soil type
- 2.7 Climate and Rainfall
- 2.8 Land use classification
- 2.9 Land holdings pattern of farmers
- 2.10 Cropping pattern
- 2.11 Sources of Irrigation
- 2.12 Consumption of chemical fertilizers and pesticides
- 2.13 Agricultural Machineries and Implements
- 2.14 Regulated Markets
- 2.15 Storage facilities
- 2.16 Banking and Insurance
- 2.17 Co-operation

2.1 Tirunelveli district at glance

Tirunelveli District was formed in 1790 by the East India Company, later came under the direct control of the British Crown Queen Victoria. The name Tirunelveli has been composed from the three Tamil words i.e. “Thiru – Nel – Veli” meaning Sacred Paddy Hedge.

Tirunelveli district is located in the southern part of Tamil Nadu and surrounded by Virudhunagar District on the North, Western Ghats on the West, Kanyakumari District on the South and Tuticorin District on the East. This District is having three Revenue Divisions comprising of 11 Taluks, 19 Development Blocks, 616 Revenue Villages and 425 Village Panchayats. Tirunelveli district is provided with varied agro climatic conditions ranging from extreme tropical to subtropical.

TIRUNELVELI DISTRICT



Fig1. Brief profile Tirunelveli district

2.2 Area, location and geographical features

Tirunelveli District having geographical area of 6759 sq.kms, in the South-eastern portion of Tamil Nadu is triangular in shape. It lies between 8°.05" and 9°.30" of the Northern latitude and 77°.05" and 78°.25" of Eastern longitude.

2.3 Administrative structure of Tirunelveli district

The Administrative structure of Tirunelveli District is given in table 2.1

Table 2.1 Administrative Structure

Sl.No	Details	Number
A.	Revenue administrative divisions	
1.	revenue divisions	3
2.	Revenue taluks	11
3.	Revenue firkas	60
4.	Revenue villages	616
B.	Local Bodies	
1.	Corporations	1
2.	Municipalities	7
3.	Panchayat unions	19
4.	Town panchayats	36
5.	Village panchayats	425

Source: Hand Book 2014

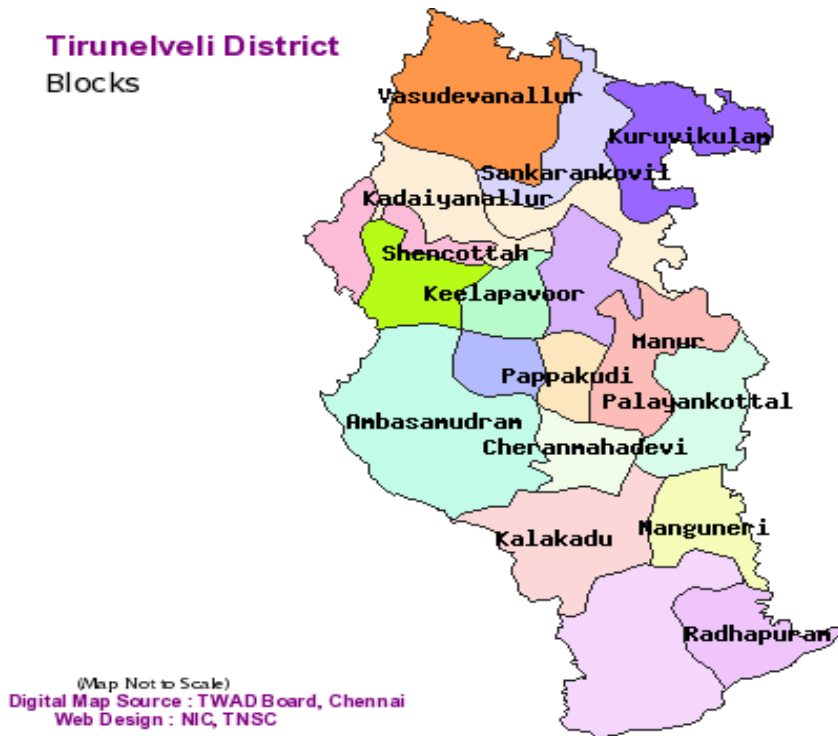


Fig 2. Blocks in Tirunelveli district

2.4 Demographic profile

The population of the District was 2723988 in 2001 Census and 3077233 as per 2011 census. The Density of Population per sq.km was 399 in 2001 census and 460 persons as per 2011 census. Tirunelveli, Tenkasi and Ambasamudram were the most densely populated Taluks in the District as per 2011 census.

The Sex ratio was 1023 females for every 1000 males. The Literacy rate was 89.24 % in male and 75.98 % in female in the District as per 2011 census.

Out of total population, males were 1333939 and females 1390049 in 2001 census and males were 1520912 and females 1556321 as per 2011 census. The district was having Schedule caste population of 569714 which represents 18.5% to the total population as per 2011 census. Schedule Tribes were found to be very small in numbers i.e., 10270 which was 0.33% to the total population. The Agricultural Laborers were 356055 as per 2001 census and 321083 as per 2011 census.

Table 2.2 Demographic details of the district

Sl.No	Details	2001 Census	2011Census
1.	Population		
a.	Male	1333939	1520912
b.	Female	1390049	1556321
c.	Total	2723988	3077233
d.	Rural	1415742	1557004
e.	Urban	1308246	1520229
2.	Density/Sq.Km	399	460
3.	Literates		
a.	Male	74.76	89.24
b.	Female	59.83	75.98
4.	Main workers		
a.	Total workers	1281117	NA
b.	Male workers	737911	NA
c.	Female workers	543206	NA
d.	Rural workers	729776	NA
e.	Urban workers	551341	NA
f.	Cultivators	137516	107943
g.	Agricultural labourers	356055	321083
h.	Household Industry	282282	626714
i.	Other workers	505264	NA
5.	Non-workers	1442871	1640779

Source: Hand Book 2014

2.5 Topography

The district is located in the southern part of Tamil Nadu and surrounded by Virudhunagar District on the north, Western Ghats on the west, Kanyakumari District on the south and Thoothukudi district on the east. The lifeline of the district is river Tamiraparani which feeds the district and quenches the thirst of residents of Tirunelveli and Thoothukudi district.

Tirunelveli district is provided with varied agro climatic conditions ranging from extreme tropical to subtropical

2.6 Soil type

Soils in the area have been classified into i) Deep red soil ii). Red sandy Soil, iii) Black cotton soil, iv) Saline coastal alluvium and v) River alluvium.

Table 2.3 Soil type of all blocks

Sl.No	Soil Type	Place
1.	Deep red soil	Sivakasi, Tenkasi, Senkottai and Sankarankoil
2.	Black cotton soil	Tirunelveli, Palayankottai and Sankarankoil
3.	Red sandy soil	Nanguneri, Ambasamudram, and Radhapuram
4.	Saline coastal alluvium	Nanguneri and Radhapuram
5.	River alluvium	Tamirabarani and Chittar river

Source: Central Ground Water Board, Govt. of India,(2009).

2.7 Climate and Rainfall

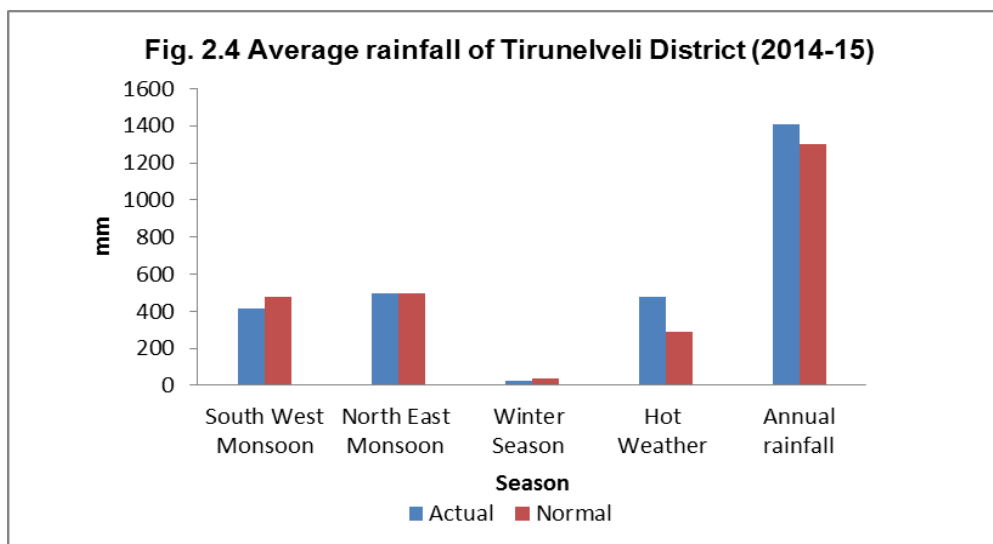
The rainfall data is presented in Table 2.4 it revealed that the average rainfall of the district was 1303.7mm. The North-East monsoon accounted for a highest proportion of 65.01per cent of the total rainfall. Summer rainfall also received in the district with 24.38 per cent of the total rainfall. Winter rainfall was almost negligent in the district i.e. 1.50 per cent. The graphical representation of rainfall of Tirunelveli district is depicted in Fig. 2.4.

Table 2.4 Month wise / season wise rainfall distribution in Tirunelveli District

Season / Month	2014-15	
	Normal (mm)	Actual (mm)
South West Monsoon		
June	8.5	37.9
July	14.1	39.5
August	56.7	26.8
September	39.5	38.2
Total	118.8 (9.11)	142.4 (16.85)
North East Monsoon		
October	393.4	157.5
November	294.2	210.1
December	159.9	99.6
Total	847.5 (65.01)	467.2 (55.28)
Winter Season		
January	4.9	35.4
February	14.6	33.9
Total	19.5 (1.50)	69.3 (8.20)
Hot Weather		
March	76.1	48.1
April	139	70.4
May	102.8	47.7
Total	317.9 (24.38)	166.2 (19.67)
Annual rainfall	1303.7 (9.11)	845.1 (9.11)

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

(Figures in parenthesis denote percentage to total annual rainfall)



2.8 Land

The land use pattern of Tirunelveli district is furnished in the Table 2.5. Area under cultivation was about 1,93,929 ha of total geographical area. The share of district area under barren and cultivable waste, current fallow and other fallow accounted for about 34.06 per cent of the total area and this would reveal that implementation of land reclamation, strengthening of irrigation facilities and so on through schemes by various departments increases the net sown area or area under forest.

Table 2.5 Land use pattern (2014-15)

Sl.No	Particulars	Area (ha)	Per cent	CGR (%)
1	Geographical area	675850	100.00	
2	Forest	127758	18.90	0.49
3	Barren & Un cultivable area	30027	4.44	0.18
4	Land put to non-agricultural uses	103169	15.27	0.37
5	Permanent pastures & other grazing lands	5156	0.76	-2.42
6	Misc. tree crops & groves not incl. in the net area sown	8511	1.26	-1.45
7	Current fallow	19254	2.85	-2.04
8	other fallow	180950	26.77	0.79
9	Net area sown	165753	24.53	1.18
10	Area sown more than once	28176	4.17	0.13
11	Gross area sown	193929	28.69	0.97
	Total	1538533		

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

2.9 Land holdings pattern of farmers

The number of operational land holdings in Tirunelveli district is presented in Table 2.6. It could be inferred from the table that the district had the preponderance of marginal and small holdings with size of land holding below two hectares.

Table 2.6 Block wise number of operational land holdings InTirunelveli district (Number)

SI.No	Particulars	Alangulam	Ambai	Nanguneri	Keelapavoor	Kadayanallur	Tenkasi	Vallioor	Sengottai	Vasudevanallur	Cheranmahadevi
		1	2	3	4	5	6	7	8	9	10
1	Below 0.50.0	7086	9337	14826	17568	10284	9438	3300	9030	19490	11070
2	0.50.0 to 1.00.0	1643	1177	3095	3160	3024	2943	1394	2359	6015	2341
3	1.00.0 to 2.00.0	1287	525	1941	1458	1670	1550	1136	1056	4174	1006
4	2.00.0 to 3.00.0	465	162	609	356	419	636	410	291	1373	273
5	3.00.0 to 4.00.0	247	63	245	117	135	169	204	131	482	132
6	4.00.0 to 5.00.0	97	37	105	50	60	102	97	55	271	79
7	5.00.0 to 7.50.0	130	30	100	34	57	97	76	64	242	97
8	7.50.0 to 10.00.0	31	12	43	18	45	42	40	29	87	42
9	10.00.0 to 20.00.0	28	11	36	6	48	33	34	20	66	63
10	20.00.0 & Above	10	4	17	1	8	13	22	16	18	13
	Total	11024	11358	21017	22768	15750	15023	6713	13051	32218	15116

Source: Deputy Director, Statistics office, Data collected from Agri-Census 2010-11

Table 2.6 Block wise number of operational land holdings in Tirunelveli district– Continue (Number)

SI.No	Particulars	Kadayam	Kalakadu	Kurvikulam	Manur	Melaneelitha nallur	Palayamkottai	Pappakudi	Radhapuram	Sankarankovil
		11	12	13	14	15	16	17	18	19
1	Below 0.50.0	10178	13623	11588	16165	5746	16745	5541	1705	6619
2	0.50.0 to 1.00.0	2389	2336	6042	2868	2836	2438	1302	1115	3016
3	1.00.0 to 2.00.0	1327	1169	5139	1496	2351	975	796	1149	2367
4	2.00.0 to 3.00.0	391	336	1810	535	897	46	198	570	802
5	3.00.0 to 4.00.0	159	137	865	843	431	100	129	287	358
6	4.00.0 to 5.00.0	89	85	471	130	229	36	66	172	159
7	5.00.0 to 7.50.0	76	75	505	137	214	53	69	213	149
8	7.50.0 to 10.00.0	28	40	175	72	77	23	19	95	43
9	10.00.0 to 20.00.0	20	41	130	52	46	15	26	103	31
10	20.00.0 & Above	5	24	15	22	14	12	11	25	2
	Total	14662	17866	26740	21720	12841	20647	8157	5434	13546

Source: Deputy Director, Statistics office, Data collected from Agri-Census 2010-11

2.10 Cropping pattern

Paddy, black gram, greengram, Maize, cholam and sugarcane are the major agricultural crops cultivated in the district. With regards to horticultural crops cashew nut, banana, mango and Tapioca are major crops grown. The details of the cropping pattern triennium average of the district are furnished in the Table 2.7.

Table 2.7 Area under major crops (Triennium ending 2014-15)

Sl.No	Crops	Area (ha)
1	Paddy	65441.78
2	Cholam	2055.436
3	Maize	10231.92
4	Black gram	19883.73
5	Green gram	6379.553
6	Coconut	157.2067
7	Cashew nut	5456.604
8	Tapioca	180.4848
9	Sugarcane	3186087
10	Banana	7632.169
11	Mango	6248.498
	Total	3309754

(Source: Season and Crop Report, 2014-2015)

2.11 Animal husbandry

The livestock population in Tirnelveli district is presented in Table 2.8. Of the total livestock in Tirunelveli district, goat population was highest (330230) followed by cattle (321113) and sheep (303105). Total poultry population was 3048085.

Table 2.8 Livestock population in the district (2011-'12 census) (in numbers)

Sl.No.	Particulars	Population
1	Cattle	321113
2	Buffaloes	28125
3	Sheep	303105
4	Goats	330230
5	Horses and ponies	27

Sl.No.	Particulars	Population
6	Donkeys	252
7	Camels	0
8	Pigs	9391
	Total Livestock	992243
9	Elephants	1
10	Dogs	52272
11	Rabbits	2504
	Poultry	
12	Back yard poultry	564474
13	Farm poultry	2483611
	Total poultry	3048085

Source: 19th Livestock Census, 2012.

2.11 Sources of irrigation

The irrigation statistics of the district is presented in Table 2.9 and 2.10. Among the irrigation sources, open wells ranked first with a proportion followed by tanks and canals.

Table 2.9 Area irrigated by different sources of water supply and growth rates

Sl.No	Area irrigated	Net area irrigated	Gross area irrigated
1	Canals	1.29	-2.69
2	Tanks	2.95	2.69
3	Tube wells	4.94	4.30
4	Ordinary wells	2.43	2.28
	Total	2.44	2.09

(Source: Season and Crop Report, 2014-2015)

Table 2.10 Irrigation by different sources in Tirunelveli district during 2014-15 (ha)

Sl.No.	Particulars	2012-13	2013-14	2014-15	Average	
1	Canals	Gross	17080	29158	26687	24308.33
		Net	15172	16466	16545	16061.00
2	Tanks	Gross	33932	34901	48976	39269.67
		Net	29922	26965	40546	32477.67
3	Tube wells / Bore wells	Gross	846	823	1377	1015.33

Sl.No.	Particulars	2012-13	2013-14	2014-15	Average
	Net	846	803	1324	991.00
4	Open wells	44334	46326	63196	51285.33
	Net	41948	41301	58160	47136.33
5	Supplementary wells	2952	2715	3074	2913.67
	Net	2876	2601	2872	2783.00

(Source: Season and Crop Report, 2014-2015)

2.12 Consumption of chemical fertilizers and pesticides

The consumption of fertilizers and pesticides during 2013-14 is given in Table 2.11. Among nitrogenous, phosphates and potassic fertilizers (52.34 Mt), nitrogenous fertilizer alone accounted for 38.18 Mt.

Table 2.11 Consumption of Chemical Fertilisers and Pesticides Year: 2013 – 2014

Fertilizers (in '000' Tonne)				Pesticides (Kg)		Urea '000' Tonne
Nitrogenous (N)	Phosphatic (P2 O5)	Potassic (K20)	Total (NPK)	Dust	Liquid	
38.18	7.24	6.92	52.34	51764.00	80740.00	31.47

Source: Joint Director of Agriculture Tirunelveli. Hand Book 2014

2.13 Agricultural machineries and implements

The details of agricultural machineries and implements in Tirunelveli district is furnished in Table 2.12. Plough (14170 Nos.), water pumps for irrigation purpose (34440 Nos.), tractors (3274 Nos.) and sugarcane crushers (8 Nos.) Paddy transplanter service must be provided for farmers to overcome labour problem during peak labour crisis period.

Table 2.12 Agricultural machineries and implements

Sl.No	Items	(Numbers)
1.	Animal operated implements ploughs	
a.	Wooden plough	11053
b.	Steel plough	3117
	Total	14170
2.	Water pumps for irrigation purpose	

Sl.No	Items	(Numbers)
	Operated by oil engine	7353
	Operated by electric power	27087
	Total	34440
3.	Tractors	
	Agricultural Tractor (Wheeled)	2413
	Crawler Tractor	861
	Total	3274
4.	Sugarcane Crushers by Power	8
5.	Power Operated Thresher	123
6.	Maize Sheller	40
	Total	171

(Source: Hand Book 2014)

2.14 Regulated markets

The details on regulated market in the Tirunelveli district are given below in the Table 2.13.

Table 2.13 Regulated markets (Year: 2014 – 2015)

Sl.No	Name of regulated markets	Quantity arrivals (‘in M.T.’)	Receipts (₹.in Lakhs)
1.	Sankarankovil	5765	43.00
2.	Tenkasi	3895	18.00
3.	Ambasamuthiram	9132	30.00
4.	Valliyoor	4666	20.00
5.	Tirunelveli	8560	48.00
6.	Pavoorsathiram	3690	10.00
7.	Kadayanallur	3670	11.00
8.	Thesayanvelai	2650	12.00
9.	Thiruvengadam	2330	07.00
10.	Sivagiri	610	04.50
11.	Alangulam	4100	17.30
	Total	49068	220.80

Source: Secretary District Agriculture Marketing Committee Office Tirunelveli-2. Hand Book 2014

2.15 Storage facilities

In Tirunelveli district there are about eight rural godowns and four cold storage available. Due to lack of storage facilities farmers are forced to sell their produce in the market with prevailing rate. The glut of produce leads to lower prices. Hence, farmers are not getting premium prices. Creation of cold storage facilities at affordable cost at village level may improve farm income.

Table 2.14 Cold storage details

Sl.No	Name of the structure	Location	Capacity (MT)
1	Cold storage for vegetables	RM,Pavoorchathram	1000
2	Cold storage for lemon	RM, Kadayanallur	200
3	Cold storage for chillies	RM, Sankarankovil	500
4	Cold storage for vegetables	Maharajanagar,Ulavarsandhai	2

Source: DD Agricultural Marketing Office, Tirunelveli

2.16 Banking and insurance

Banking sector should cater to the short and long term credit needs of farmers, especially marginal and small farmers, so as to facilitate them in procuring the required farm inputs at appropriate time. The credit institutions present in the district are given in Table 2.15.

Table 2.15 Banking and insurance details

Sl.No	Details	Number
A.	Banks	
1.	Commercial banks	224
2.	DCCB etc.	45
3.	Private sector banks	48
4.	Regional Rural Banks	50
5.	Lead bank	62
B.	Insurance	
1.	Offices	23
2.	Policies issued	224003
3.	Premium received (₹.in. Crores)	3022.06

Table 2.16 Insurance scheme (Year: 2014 – 2015)

Sl.No	Name of the insurance	No. of branches	Policies issued	Premium received (in Crores)	No. of beneficiaries	Amount paid as compensation (in Crores)
1.	L.I.C	16	167359	2499.59	150691-Tot (145600-M 5091-D)	429.83-Tot (382.85-M 46.98-D)
2.	Oriental	3	25332	514.29	25332	297.71
3.	National Insurance Co.LTD.	4	31312	8.18	31518	5.85

Source: Concerned Insurance Institutions, Hand Book – 2014

Table 2.17 Crop insurance scheme for the Fasli (Year: 2014 – 2015)

Sl.No	Name of the Crop	No of Blocks notified	Premium collected	No. of Beneficiaries	Amount Sanctioned (in ₹.)
1.	Paddy I	19	9475	25	379000
2.	Paddy II	19	422271	2666	40006310
3.	Maize	4	415330	419	6922150
4.	Ground Nut	5	0	0	0
5.	Cotton	6	0	0	0
6.	Sugarcane	4	0	0	0
7.	Plantain	14	144717	201	4338867
8.	Onion	5	0	0	0
9.	Tapioca	1	0	0	0
10.	Sunflower	19	0	0	0
11.	Cumbu	0	0	0	0
12.	Cholam	1	0	0	0
13.	Ragi	0	0	0	0

Sl.No	Name of the Crop	No of Blocks notified	Premium collected	No. of Beneficiaries	Amount Sanctioned (in ₹.)
14.	Black gram	7	3828	7	39830
15.	Green gram	4	0	0	0
16.	Horse gram	0	0	0	0
17.	Chillies	6	1738	1	39680
18.	Paddy III	1	0	0	0
19.	Sesame	1	0	0	0
	Total		997359	3319	51725837

Source: J.R. Co – operative, Tirunelveli – 2.Hand Book –2014

2.17 Co-operation

The details on cooperative societies are given below

Table 2.18 Co-operation societies

Sl.No	Details	Number
1.	District Central Cooperative Banks (including branches)	30
2.	P.A.C.B	158
3.	Primary Agricultural and Rural Development Bank	08
4.	Cooperative Urban Bank	06
5.	Whole sale co-operative store	01
6.	Primary cooperative stores	33
7.	Students cooperative store	144
8.	Cooperative employees thrift and credit society	79

Source: Hand Book - 2014

CHAPTER III
DEVELOPMENT OF AGRICULTURE AND ALLIED SECTORS

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

- i. Assessing the trends in area, production and productivity of major crops and projection till the 12th Plan period (2014-15)
- ii. Yield gap analysis for the major crops

3.1 Trends in area, production and productivity of major crops

The area and production and productivity of major crops in Tirunelveli district are given in Table.3.1.

Table 3.1 Area Production and yield of major crops in Tirunelveli district
(Triennium average ending 2014-15)

Sl.No	Crops	Area (Ha)	Production (Tonnes)	Yield (kg/ha)
1	Paddy	65441.78	326292.7	4986
2	Cholam	2055.436	5438	2645.667
3	Maize	10231.92	60324	5895.667
4	Black gram	19883.73	17557.333	883
5	Green gram	6379.553	5137.6667	805.33333
6	Coconut*	157.2067	1235.33	7858.00
7	Cashew nut	5456.604	482	88.333333
8	Tapioca	180.4848	5808	32180
9	Sugarcane	3186087	232584.33	73
10	Banana	7632.169	187357	24548.33
11	Mango	6248.498	134928	21593.67
	Total	3309754		

(Source: Season and Crop Report, 2014-2015)

*In lakh nuts

The Compound growth rates are shown in Table 3.2.

Table 3.2 Compound Growth Rates (CGR) of area, production and productivity under major crops in Tirunelveli district

Sl.No	Crops	CGR during 2005-2006 to 2014-15 (%)		
		Area	Production	Productivity
1	Paddy	2.437	3.634	1.169
2	Cholam	-1.846	-1.029	0.820
3	Maize	4.929	26.072	20.150
4	Black gram	-0.739	2.840	3.618
5	Green gram	0.323	3.769	3.437
6	Coconut	0.535	-5.940*	-5.909*
7	Cashew nut	1.479	-5.080	-6.447
8	Tapioca	-0.044	-0.509	-0.464
9	Sugar cane	3.875	1.750	-2.000
10	Banana	4.034	-1.571	-4.075
11	Mango	4.842	1.417	-3.203

* Denotes growth rates during 2014-2015

3.2. Projection on area, production and yield by 2023

The area, production, productivity of the crops for the year of 2023 has been calculated and furnished in the Table 3.3.

Table 3.3 Projected area, production and productivity for 2023

Sl.No	Crop name	Area (ha)	Production (Tonnes)	Productivity (Production/Area)
1.	Paddy	91681.366	376849.647	4.110
2.	Cholam	1999.376	7038.282	3.520
3.	Cumbu	23.165	93.620	4.041
4.	Maize	39284.443	1036723.680	26.390
5.	Ragi	8.878	25.987	2.927
6.	Bengal gram	11.439	47.362	4.140
7.	Green gram	32116.240	9120.879	0.284

Sl.No	Crop name	Area (ha)	Production (Tonnes)	Productivity (Production/Area)
8.	Red gram	53.372	40.914	0.767
9.	Black gram	38172.482	7216.634	0.189
10.	Horse gram	30.123	4.035	0.134
11.	Chillies	930.798	2059.196	2.212
12.	Turmeric	1.155	5.961	5.163
13.	Sugarcane	9557.126	911611.204	95.385
14.	Onion	4128.736	63243.435	15.317
15.	Gingelly	835.468	760.808	0.911
16.	Groundnut	490.686	1467.184	2.215
17.	Castor	63.330	3.956	0.062
18.	Coconut	20006.430	4551.066	0.227
19.	Sunflower	33325.401	38666.133	1.160
20.	Cotton	580.661	3566.512	6.142
21.	Tobacco	0.853	0.213	0.409
22.	Mango	6341.080	36981.225	5.832
23.	Cashew nut	7249.497	983.023	0.136
24.	Banana	36251.461	135447.233	3.736

Table 3.4 Projected area, production and productivity of horticulture crops- 2023

Sl.No	Crop name	Area (ha)	Production (Tonnes)	Productivity (Production/Area)
1.	Coconut	20006.430	4551.066	0.227
2.	Banana	36251.461	135447.233	3.736
3.	Mango	6341.080	36981.225	5.832
4.	Cashew nut	7249.497	983.023	0.136
5.	Lemon	2065.110	46505.185	22.519
6.	Onion	4128.736	63243.435	15.317

Table 3.5 Yield gap analysis

Variety	Paddy					
	Yield in Kg/ha					
	Yield GAP I	Yield GAP II	Overall YG			
ADT 43	1895	1431	3326			
ADT 45	3330	1679	5009			
ASD 16	404	1046	1450			
ADT 39	626	249	875			
CO 49	1459	1666	3125			
BPT 5204	185	304	489			
Ruling varieties	ADT 43	ADT 45	ASD 16	ADT 39	CO 49	BPT 5204
Potential yield	8381	9230	5600	7000	9750	7989
Progressive farmer yield	6486	5900	5196	6374	8291	7804
Average yield	5055	4221	4150	6125	6625	7500
Overall yield Gap	3326	5009	1450	875	3125	489
Required growth rates	65.80	118.67	34.94	14.29	47.17	6.52
Annual growth rate	5.48	9.89	2.91	1.19	3.93	0.54

Year	ADT 43	ADT 45	ASD 16	ADT 39	CO 49	BPT 5204
2010-11	5055	4221	4150	6125	6625	7500
2011-12	5332	4638	4271	6198	6885	7541
2012-13	5625	5097	4395	6272	7156	7582
2013-14	5933	5601	4523	6346	7437	7623
2014-15	6258	6155	4655	6422	7730	7664
2015-16	6601	6764	4790	6498	8034	7706
2016-17	6963	7433	4930	6576	8349	7748
2017-18	7345	8168	5073	6654	8678	7790
2018-19	7748	8975	5221	6733	9019	7832
2019-20	8173	9863	5373	6813	9373	7875
2020-21	8621	10838	5530	6894	9742	7918
2021-22	9093	11910	5691	6977	10125	7961
2022-23	9592	13088	5856	7060	10522	8004
		Unit				
Area under Paddy	79764	Ha				
Production	351822	tonnes				
Yield	4.41	tonnes				
Doubling the production	703644	tonnes				
Yield	8.82	tonnes				

	ADT 43	ADT 45	ASD 16	ADT 39	CO 49	BPT 5204	
Proportion of varieties	0.036	0.131	0.47	0.063	0.23	0.07	1
Area	2872	10449	37489	5025	18346	5583	79764
2011-12	15311	13319	12264	17797	19772	21653	100116
2012-13	16151	53260	164771	31516	131283	42332	439313
2013-14	17036	58527	169569	31891	136444	42562	456029
2014-15	17971	64315	174506	32271	141807	42794	473664
2015-16	18956	70675	179587	32655	147381	43026	492280
2016-17	19995	77664	184816	33044	153175	43260	511954
2017-18	21092	85344	190197	33437	159196	43495	532761
2018-19	22248	93784	195735	33835	165453	43731	554786
2019-20	23468	103058	201434	34238	171957	43969	578124
2020-21	24755	113250	207299	34646	178716	44208	602874
2021-22	26112	124449	213335	35058	185741	44448	629143
2022-23	27544	136756	219547	35476	193042	44690	657055

In Tirunelveli district, the major paddy varieties are ASD 16 (47%), CO 49 (23%), ADT 45 (13%), BPT (7%), ADT 39 (6%) and ADT 43 (3%), The yield gap for this varieties are 1450kg/ha, 3125kg/ha, 5009kg/ha, 489kg/ha, 875kg/ha and 3326 respectively. To reduce yield gap in this varieties, the required annual growth was worked out as 2.91 %, 3.93 %, 9.89 %, 0.54 %, 1.19 % and 5.48 % respectively. With this calculated annual growth rate, Tirunelveli district will reach the projected production near to double (657054 tonnes) in 2023 from the present level of 351822 tonnes.

Table 3.6 Yield Gap Analysis for Black gram

Yield Gap Analysis for Black gram						
	Yield in Kg/ha					
Variety	Yield GAP I	Yield GAP II	Overall YG			
VBN3	436	54	490			
VBN4	294	266	560			
ADT3	63	337	400			
ADT4	100	72	172			
CO5	830	20	850			
T9	844	14	858			
Potential yield	825	900	720	600	1270	1000
Progressive farmer yield	389	606	657	500	440	156
Average yield	335	340	320	428	420	142
Overall yield Gap	490	560	400	172	850	858
Required growth rates	146.27	164.71	125.00	40.19	202.38	604.23
Annual growth rate	12.19	13.73	10.42	3.35	16.87	50.35
Year	VBN3	VBN4	ADT3	ADT4	CO5	T9
2010-11	335	340	320	428	420	142
2011-12	376	387	353	442	491	214
2012-13	422	440	390	457	574	321
2013-14	473	500	431	472	670	483

2014-15	531	569	476	488	783	726	
2015-16	595	647	525	505	916	1091	
2016-17	668	736	580	522	1070	1640	
2017-18	749	837	640	539	1250	2466	
2018-19	841	951	707	557	1461	3708	
2019-20	943	1082	781	576	1708	5575	
2020-21	1058	1230	862	595	1996	8383	
2021-22	1187	1399	952	615	2332	12604	
2022-23	1332	1591	1051	635	2726	18950	
		Units					
Area under Black gram	10459	Ha					
Production	3281	Tonnes					
Yield	0.31	Tonnes					
Doubling the production	6562	Tonnes					
Yield	0.63	Tonnes					
Variety	VBN3	VBN4	ADT3	ADT4	CO5	T9	
Proportion of varieties	0.6	0.2	0.1	0.02	0.03	0.05	1
Area	6275	2092	1046	209	314	523	10459
2011-12	2359	2426	2217	2776	3080	1340	14198
2012-13	2646	920	408	96	180	168	4418
2013-14	2969	1046	451	99	210	252	5027

2014-15	3330	1190	497	102	246	379	5744
2015-16	3736	1353	549	106	287	571	6602
2016-17	4192	1539	607	109	336	858	7641
2017-18	4703	1750	670	113	392	1290	8918
2018-19	5276	1990	739	117	458	1939	10519
2019-20	5919	2263	816	120	536	2916	12570
2020-21	6640	2574	902	124	626	4384	15250
2021-22	7450	2927	995	129	732	6591	18824
2022-23	8358	3329	1099	133	855	9910	23684

In Tirunelveli district, the major Black gram varieties are VBN 3 (60%), VBN 4 (20%), ADT 3 (10%), ADT 4 (2%), CO 5 (3%) and T 9 (5%). The yield gap for these varieties are 490kg/ha, 560kg/ha, 400kg/ha, 172kg/ha, 850kg/ha and 858kg/ha respectively. To reduce yield gap in these varieties, the required annual growth was worked out as 12.19 %, 13.73%, 10.42 %, 3.35%, 16.87 % and 50.35 % respectively. With this calculated annual growth rate, as per our Tamil Nadu Government concentration on pulses in Tirunelveli district will reach the projected production of more than triple (23684 tonnes) in 2023 from the present level of 3281 tonnes.

Table 3.7 Yield gap Analysis for Maize

Yield in Kg/ha				
Variety	Yield GAP I	Yield GAP II	Overall YG	Total
NK 6240	2296	58	2354	
PIONEER	1779	687	2466	
HIHELL	672	1612	2284	
Ruling varieties	NK 6240	PIONEER	HIHELL	
Potential yield	4644	8500	6460	
Progressive farmer yield	2348	6721	5788	
Average yield	2290	6034	4176	
Overall yield gap	2354	2466	2284	
Required growth rates	102.79	40.87	54.69	
Annual growth rate	8.57	3.41	4.56	
Year	NK 6240	PIONEER	HIHELL	
2010-11	2290	6034	4176	
2011-12	2486	6240	4366	
2012-13	2699	6452	4565	
2013-14	2930	6672	4773	
2014-15	3181	6899	4991	
2015-16	3454	7134	5218	
2016-17	3750	7377	5456	
2017-18	4071	7628	5705	
2018-19	4420	7888	5965	

2019-20	4798	8157	6237	
2020-21	5209	8434	6521	
2021-22	5656	8722	6818	
2022-23	6140	9019	7129	
		Units		
Area under Maize	7055	Ha		
Production	22468	tonnes		
Yield	3.18	tonnes		
Doubling the production	44936	tonnes		
Yield	6.37	tonnes		
	NK 6240	PIONEER	HIHELL	
Proportion of varieties	0.4	0.2	0.4	1
Area	2822	1411	2822	7055
2011-12	7016	17608	12322	36946
2012-13	7617	9104	12883	29604
2013-14	8269	9414	13471	31154
2014-15	8978	9734	14085	32797
2015-16	9747	10066	14726	34539
2016-17	10582	10409	15398	36389
2017-18	11488	10763	16099	38350
2018-19	12472	11130	16833	40435
2019-20	13541	11509	17601	42651
2020-21	14701	11901	18403	45005
2021-22	15960	12306	19241	47507
2022-23	17327	12725	20118	50170

In Tirunelveli district, the major Maize varieties are NK 6240 (40%), Pioneer (20%) and HI hell (40%). The yield gap for this varieties are 2354kg/ha, 2466kg/ha, and 2284 kg/ha respectively. To reduce yield gap in this varieties, the required annual growth was worked out as 8.57 %, 3.411%, and 4.56% respectively. With this calculated annual growth rate Tirunelveli district will reach the projected production of more than double (50171 tonnes) in 2023 from the present level of 22468 tonnes.

Green gram

Table 3.8 Yield Gap Analysis for Green gram

Yield in Kg/ha				
Variety	Yield GAP I	Yield GAP II	Overall YG	
VBN3	545	25	570	
CO6	192	264	456	
KM2	600	8	608	
PAIYUR 1	11	191	202	
Ruling varieties	VBN 3	CO6	KM2	PAIYUR 1
Potential yield	1550	1050	767	742
Progressive farmer yield	1005	858	167	731
Average yield	980	594	159	540
Overall Yield Gap	570	456	608	202
Required growth rates	58.16	76.77	382.39	37.41
Annual growth rate	4.85	6.40	31.87	3.12
Year	VBN 3	CO6	KM2	PAIYUR 1
2010-11	980	594	159	540
2011-12	1028	632	210	557
2012-13	1077	672	276	574
2013-14	1130	715	365	592

2014-15	1184	761	481	611	
2015-16	1242	810	634	630	
2016-17	1302	862	836	649	
2017-18	1365	917	1102	669	
2018-19	1431	976	1454	690	
2019-20	1500	1038	1917	712	
2020-21	1573	1104	2528	734	
2021-22	1649	1175	3333	757	
2022-23	1729	1250	4395	780	
		Units			
Area under Green gram	4914	Ha			
Production	1938	tonnes			
Yield	0.39	tonnes			
Doubling the production	3876	tonnes			
Yield	0.79	tonnes			
	VBN 3	CO6	KM2	PAIYUR 1	
Proportion of varieties	0.4	0.37	0.2	0.03	1
Area	1966	1818	983	147	4914
2011-12	2020	1242	412	1095	4769
2012-13	2118	1223	272	85	3698
2013-14	2220	1301	358	87	3966

2014-15	2328	1384	472	90	4274
2015-16	2441	1473	623	93	4630
2016-17	2559	1567	822	96	5044
2017-18	2683	1667	1083	99	5532
2018-19	2813	1774	1429	102	6118
2019-20	2949	1887	1884	105	6825
2020-21	3092	2008	2484	108	7692
2021-22	3242	2136	3276	112	8766
2022-23	3399	2273	4320	115	10107

In Tirunelveli district, the major Green gram varieties are VBN 3 (40%), CO6 (37%) KM 2 (20%) and Paiyur 1 (3%). The yield gap for this varieties are 570 kg/ha, 456 kg/ha, 608 kg/ha and 202 kg/ha respectively. To reduce yield gap in this varieties, the required annual growth was worked out as 4.85 %, 6.40%, 31.87 and 3.12% respectively. With this calculated annual growth rate, the Tamil Nadu Government vision on pulses in Tirunelveli district will reach the projected production more than triple (10107 tonnes) in 2023 from the present level of 1938 tonnes.

Sugarcane

Table 3.9 Yield Gap Analysis for Sugarcane

Yield in Kg/ha			
Variety	Yield GAP I	Yield GAP II	Overall YG
COC 86032	98000	25000	123000
COC 671	16000	13000	29000
Ruling varieties	COC 86032	COC 671	
Potential yield	208000	125000	
Progressive farmer yield	110000	109000	
Average yield	85000	96000	
Overall yield gap	123000	29000	
Required growth rates	144.71	30.21	
Annual growth rate	12.06	2.52	
Year	COC 86032	COC671	
2010-11	85000	96000	
2011-12	95250	98417	
2012-13	106736	100894	
2013-14	119607	103434	
2014-15	134030	106038	
2015-16	150193	108707	
2016-17	168304	111444	
2017-18	188600	114249	
2018-19	211343	117125	
2019-20	236828	120074	

2020-21	265387	123096	
2021-22	297389	126195	
2022-23	333251	129372	
		Units	
Area under sugarcane	4776	Ha	
Production	562688	tonnes	
Yield	117.82	tonnes	
Doubling the production	1125376	tonnes	
Yield	235.63	tonnes	
	COC 86032	COC671	
Proportion of varieties	0.6	0.4	1
Area	2866	1910	4776
2011-12	272948	282023	554971
2012-13	305863	192748	498611
2013-14	342746	197600	540346
2014-15	384077	202575	586652
2015-16	430393	207674	638067
2016-17	482293	212902	695195
2017-18	540452	218262	758714
2018-19	605624	223756	829380
2019-20	678655	229389	908044
2020-21	760493	235163	995656
2021-22	852199	241083	1093282
2022-23	954964	247152	1202116

Banana

Table 3.10 Yield Gap Analysis for Banana

Yield in Kg/ha							
Variety	Yield GAP I	Yield GAP II	Overall YG				
Poovan	0	0	32000				
Nendran	0	0	15000				
Robusta	0	0	25000				
Rasthali	0	0	19000				
Nadu/Local	0	0	15000				
Sakkai	0	0	22542				
Ruling varieties	Poovan	Nendran	Robusta	Rasthali	Nadu/Local	Sakkai	
Potential Yield	50000	30000	55000	40000	35000	45000	
Progressive farmer yield		0	0	0	0	0	
Average yield	18000	15000	30000	21000	20000	22458	
Overall yield gap	32000	15000	25000	19000	15000	22542	
Required growth rates	177.78	100.00	83.33	90.48	75.00	100.37	
Annual growth rate	14.81	8.33	6.94	7.54	6.25	8.36	
Year	Poovan	Nendran	Robusta	Rasthali	Nadu/Local	Sakkai	
2010-11	18000	15000	30000	21000	20000	22458	
2011-12	20667	16250	32083	22583	21250	24337	
2012-13	23728	17604	34311	24286	22578	26372	

2013-14	27244	19071	36694	26117	23989	28578	
2014-15	31280	20660	39242	28086	25489	30968	
2015-16	35914	22382	41967	30204	27082	33559	
2016-17	41234	24247	44882	32481	28774	36366	
2017-18	47343	26268	47999	34930	30573	39408	
2018-19	54357	28457	51332	37564	32483	42704	
2019-20	62410	30828	54897	40396	34514	46276	
2020-21	71656	33397	58709	43442	36671	50147	
2021-22	82272	36180	62786	46717	38963	54341	
2022-23	94460	39196	67146	50239	41398	58886	
		Units					
Area under Banana	9157	Ha					
Production	233123	Tonnes					
Yield	25.46	Tonnes					
Doubling the production	466246	Tonnes					
Yield	50.92	Tonnes					
	Poovan	Nendran	Robusta	Rasthali	Nadu/Local	Sakkai	
Proportion of varieties	0.1	0.4	0.1	0.03	0.22	0.15	1
Area	916	3663	916	275	2015	1374	9159
2011-12	18924	14880	29379	20680	19459	22285	125607
2012-13	21728	64481	31419	6672	45485	36223	206008

2013-14	24947	69854	33601	7175	48327	39253	223157
2014-15	28643	75675	35934	7716	51348	42537	241853
2015-16	32886	81981	38430	8297	54557	46095	262246
2016-17	37758	88813	41098	8923	57967	49950	284509
2017-18	43352	96214	43952	9596	61590	54128	308832
2018-19	49775	104232	47005	10319	65439	58656	335426
2019-20	57149	112918	50269	11097	69529	63562	364524
2020-21	65615	122328	53760	11934	73875	68879	396391
2021-22	75336	132522	57493	12834	78492	74640	431317
2022-23	86497	143565	61486	13801	83398	80884	469631

In Tirunelveli district, the major Banana varieties are Nendran (40%), Nadu/Local (22%), Sakai (15%) Poovan (10%) Robusta (10%) and Rasthali (3%). The yield gap for this varieties are 15000 kg/ha, 15000 kg/ha, 22542 kg/ha , 32000 kg/ha, 25000 kg/ha and 25000 kg/ha respectively. To reduce yield gap in this varieties, the required annual growth was worked out as 8.33 %, 6.25 %, 8.36%, 14.81%, 6.94 % and 7.54 % respectively. With this calculated annual growth rate, Tirunelveli district will reach the projected production of more than double (469630 tonnes) in 2023 from the present level of 233123 tonnes.

Mango

Table 3.11 Yield gap Analysis for Mango

Yield in Kg/ha							
Variety	Yield GAP I	Yield GAP II	Overall YG				
Panganapalli	0	0	6345				
Neelam	0	0	7079				
Bangalora	0	0	8850				
Alphonso	0	0	4375				
Sendura	0	0	4125				
Kalepad	0	0	4158				
Ruling varieties	Panganapalli	Neelam	Bangalora	Alphonso	Sendura	Kalepad	
Potential yield	10400	11500	13200	8500	10750	9658	
Progressive farmer yield	0	0	0	0	0	0	
Average yield	4055	4421	4350	4125	6625	5500	
Overall yield gap	6345	7079	8850	4375	4125	4158	
Required growth rates	156.47	160.12	203.45	106.06	62.26	75.60	
Annual growth rate	13.04	13.34	16.95	8.84	5.19	6.30	
Year	Panganapalli	Neelam	Bangalora	Alphonso	Sendura	Kalepad	
2010-11	4055	4421	4350	4125	6625	5500	

2011-12	4584	5011	5088	4490	6969	5847	
2012-13	5181	5680	5950	4886	7330	6215	
2013-14	5857	6437	6959	5318	7711	6606	
2014-15	6621	7296	8139	5788	8111	7023	
2015-16	7484	8270	9518	6300	8532	7465	
2016-17	8460	9373	11132	6857	8974	7935	
2017-18	9563	10624	13020	7463	9440	8435	
2018-19	10810	12042	15227	8122	9930	8967	
2019-20	12220	13649	17808	8840	10445	9532	
2020-21	13813	15470	20828	9622	10987	10132	
2021-22	15614	17534	24359	10472	11557	10770	
2022-23	17650	19874	28489	11397	12157	11449	
		Units					
Area under Mango	5916	Ha					
Production	58465	Tonnes					
Yield	9.88	Tonnes					
Doubling the production	116930	Tonnes					
Yield	19.77	Tonnes					
	Panganapalli	Neelam	Bangalora	Alphonso	Sendura	Kalepad	
Proportion of varieties	0.2	0.3	0.3	0.1	0.05	0.05	1

Area	1183	1775	1775	592	296	296	5917
2011-12	5423	5929	6020	5312	8245	6918	37847
2012-13	6131	10080	10560	2891	2168	1838	33668
2013-14	6930	11425	12350	3146	2281	1954	38086
2014-15	7834	12950	14444	3424	2399	2077	43128
2015-16	8855	14678	16893	3727	2524	2208	48885
2016-17	10010	16636	19757	4056	2655	2347	55461
2017-18	11315	18856	23107	4415	2792	2495	62980
2018-19	12791	21372	27025	4805	2937	2652	71582
2019-20	14458	24224	31606	5230	3090	2819	81427
2020-21	16344	27456	36965	5692	3250	2997	92704
2021-22	18475	31120	43232	6195	3419	3186	105627
2022-23	20884	35272	50562	6743	3596	3387	120444

In Tirunelveli district, the major Mango varieties are Neelam (30%), Bangalore (30%), Panganapalli (20%), Alphonso (10%), Sendura (5%) and Kalepad (5%). The yield gap for this varieties are 7079 kg/ha, 8850 kg/ha, 6345 kg/ha, 4375 kg/ha, 4125 kg/ha and 4158 kg/ha respectively. To reduce yield gap in this varieties, the required annual growth was worked out as 13.34 %, 16.95 %, 13.04%, 8.84%, 5.19% and 6.30 % respectively. With this calculated annual growth rate, Tirunelveli district will reach the projected production of more than double (120444 tonnes) in 2023 from the present level of 58465 tonnes.

Cashew

Table 3.12 Yield Gap Analysis for Cashew

Variety	Yield in Kg/ha		Overall YG
	Yield GAP I	Yield GAP II	
VRI 1	0	0	400
VRI 2	0	0	300
Ruling varieties	VRI1	VRI2	
Potential yield	1400	1600	
Progressive farmer yield	0	0	
Average yield	1000	1300	
Overall yield gap	400	300	
Required growth rates	40.00	23.08	
Annual growth rate	3.33	1.92	
Year	VRI 1	VRI 2	
2010-11	1000	1300	
2011-12	1033	1325	
2012-13	1068	1350	
2013-14	1103	1376	
2014-15	1140	1403	
2015-16	1178	1430	
2016-17	1217	1457	
2017-18	1258	1485	
2018-19	1300	1514	

2019-20	1343	1543	
2020-21	1388	1573	
2021-22	1434	1603	
2022-23	1482	1634	
		Units	
Area under Cashew	4452	Ha	
Production	470	Tonnes	
Yield	0.11	Tonnes	
Doubling the production	940	Tonnes	
Yield	0.21	Tonnes	
	VRI 1	VRI 2	
Proportion of varieties	0.6	0.4	1
Area	2671	1781	4452
2011-12	2760	3539	6299
2012-13	2852	2405	5257
2013-14	2947	2451	5398
2014-15	3046	2498	5544
2015-16	3147	2546	5693
2016-17	3252	2595	5847
2017-18	3360	2645	6005
2018-19	3472	2696	6168
2019-20	3588	2748	6336
2020-21	3708	2801	6509
2021-22	3831	2855	6686
2022-23	3959	2910	6869

In Tirunelveli district, the major Cashew varieties are VRI 1 (60%) and VRI 2 (40%) . The yield gap for this varieties are 400 kg/ha, and 300 kg/ha respectively. To reduce yield gap in this varieties, the required annual growth was worked out as 3.33 %, and 1.92 % respectively. With this calculated annual growth rate Tirunelveli district will reach the projected production of more than double (6869 tonnes) in 2023 from the present level of 470 tonnes.

Table 3.13 Projected area, production and yield for the major potential crops identified

Description	Paddy			Cholam			Maize			Black gram		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Compound Growth Rate (%)	2.43	3.63	1.16	-1.846	-1.029	0.820	4.929	26.072	20.150	-0.739	2.840	3.618
Triennium average ending 2011-12	84161	389033	4615	2056	3886	1899	8315	41096	4787	10593	5903	550
2012-13	92478	413512	4472	1959	3868	1973	9574	59406	6205	12093	6324	523
2013-14	94732	428539	4524	1923	3828	1989	10045	74894	7455	12003	6504	542
2014-15	97041	444112	4577	1887	3789	2006	10541	94421	8958	11915	6688	562
2015-16	99406	460252	4630	1852	3750	2022	11060	119038	10763	11827	6878	582

Description	Green gram			Coconut			Cashew nut			Tapioca		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Compound Growth Rate (%)	0.323	3.769	3.437	0.535	-5.940*	-5.909*	1.479	-5.080	-6.447	-0.044	-0.509	-0.464
Triennium average ending 2011-12	4928	2965	606	15597	1543	9900	4551	799	172	190	6645	34860
2012-13	6159	3664	595	15896	1338	8618	5063	1155	228	169	6099	36048
2013-14	6179	3802	615	15981	1259	8109	5138	1096	214	169	6068	35881
2014-15	6199	3945	636	16067	1184	7630	5214	1041	200	169	6037	35714
2015-16	6219	4094	658	16153	1114	7179	5291	988	187	169	6006	35548

Description	Sugarcane			Banana			Mango		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
Compound Growth Rate (%)	3.875	1.750	-2.000	4.034	-1.571	-4.075	4.842	1.417	-3.203
Triennium Average ending 2011-12	4889	445732	91	9152	226882	24779	5833	30078	5174
2012-13	5664	500220	89	10060	250367	26419	6345	18745	2973
2013-14	5883	508974	87	10466	246433	25342	6652	19010	2878
2014-15	6111	517881	85	10888	242560	24310	6974	19280	2786
2015-16	6348	526943	84	11328	238749	23319	7312	19553	2697

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

CHAPTER IV

DISTRICT PLAN

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

4.1 Agriculture sector

Agriculture 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 agricultural products. The farmers are ready to go for improved cultivation practices and export oriented agriculture which is remunerative to them.

4.1.1 Enhancing rice productivity in Tirunelveli district

Rice is the most important food grain crops In Tirunelveli district and grown in an area of 73,552 ha. The average yield of rice in the district is around 5.8 tonnes/ha. The area under rice is decreasing year by year due to the failure of monsoon. But the demand for food is increasing due to the rise in population. This has to be met with only by increasing the productivity of paddy from the limited available area. System of Rice Intensification (SRI) and Integrated Management Practices (IMP) etc., are the new technologies which need awareness creation and adoption for improving the productivity of the crop. Besides, due to shortage of farm workers, farmers are not in a position to undertake various field operations in time. So the distribution of incentives for machine planting and the supply of farm machineries like automatic nursery raising machine, cono weeder, transplanter, power tiller, rotavator, combined harvester and power sprayer for pesticides application will enhance the efficient and judicious use of inputs as well as saves labour. The supply of certified seeds, portrays and tarpaulin for nursery establishment, micronutrients, herbicides, bio-fertilizers, manures, biocontrol agents and rat traps will certainly improve the production and productivity of rice. Thus, the overall goal of enhancing the rice yield upto 6-7 tonnes/ha may be achieved

Project components

1. SRI cultivation in rice for all blocks.
2. Distribution of certified seeds for all blocks.
3. Distribution of foundation seeds in Cheranmahadevi, Kadayam, Kadayanallur, Kalakadu, Naguneri, Palayamkottai, Shencottai, Tenkasi and Vasudevanallur.
4. Giving incentives to paddy machine planting for all blocks except Kuruvikulam.
5. Distribution of portray to Vasudeva nallur.
6. Distribution of MN mixture for all blocks except Kuruvikulam.
7. Distribution of zinc sulphate to all blocks.
8. Distribution of bio control agents for all blocks except Kuruvikulam.

Budget

The budget requirement for fulfilling the various interventions is ₹ 4661.95 Lakhs.

Expected outcome

To enhance the production and productivity of rice through adoption of improved methods in cultivation, farm machineries and the supply of inputs.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.1. Budget requirement for rice in Tirunelveli district

(₹ in Lakhs)

Sl. No	Interventions	Blocks Covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Promotion of SRI	All Blocks	Ha	0.1500	1810	271.50	1535	230.25	1535	230.25	1560	234.00	1585	237.75	7350	1203.75
2	Distribution of High Yielding Varieties	All Blocks	MT	0.3500	460	161.00	400	140.00	400	140.00	405	141.75	405	141.75	1910	724.50
3	Distribution of Foundation	B3, B4, B5, B6, B12, B13, B16, B17 & B19	MT	0.4000	38	15.20	30	12.00	30	12.00	30	12.00	30	12.00	142	63.20
4	seed production - Foundation	B3, B13 & B19	MT	0.3200	30	9.60	90	28.80	90	28.80	90	28.80	90	28.80	390	124.80
5	seed production - Certified class	All Blocks except B8	MT	0.2600	460	119.60	400	104.00	400	104.00	400	104.00	400	104.00	1900	535.60
6	Incentives for paddy machine planting	All Blocks except B8	Ha	0.1000	2610	261.00	2450	245.00	2615	261.50	2715	271.50	2800	280.00	12790	1319.00
7	Distribution of Protray	B19	No	0.0008	1000	0.80	1000	0.80	1000	0.80	1000	0.80	1000	0.80	5000	4.00
8	Distribution of MN mixture/ Copper Sulphate	All Blocks except B8	Ha	0.0100	2550	25.50	2050	20.50	2280	22.80	2395	23.95	2625	26.25	11000	119.00
9	Distribution of biofertilizer / PPFM / bioinputs / plant nutrient mobilizing bacteria	All Blocks	Ha	0.0030	2930	8.79	2330	6.99	2330	6.99	2330	6.99	2330	6.99	11050	36.75
10	Distribution of Zinc sulphate (Soil application & foliar)	All Blocks	Ha.	0.0100	3420	34.20	3395	33.95	3470	34.70	3620	36.20	3745	37.45	16550	176.50
11	Distribution of biocontrol agents/biopesticides	All Blocks except B8	Ha..	0.0100	3000	30.00	2725	27.25	2850	28.50	2975	29.75	3100	31.00	13850	146.50
12	Polyvinyl coated Tarpaulin (6m x 5m)	All Blocks	No.	0.0200	860	17.20	700	14.00	720	14.40	740	14.80	760	15.20	3460	75.60

Sl. No	Interventions	Blocks Covered	Unit	Unit Cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
13	Direct sown paddy with seed drill sowing	B13	Ha	0.0700	40	2.80	40	2.80	40	2.80	40	2.80	40	2.80	200	14.00
14	Establishment of community paddy nursery	All Blocks	Ha	0.2500	50	12.50	50	12.50	50	12.50	50	12.50	50	12.50	250	62.50
15	Demonstration of drip irrigation	All Blocks	Ha	1.0000	20	20.00	20	20.00	20	20.00	20	20.00	20	20.00	100	100.00
						980.94		890.09		911.29		931.09		948.54		4661.95

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.2 Enhancing millets productivity in Tirunelveli district

In Tirunelveli district, millets are cultivated approximately in an area of 12958 ha, mostly under rainfed condition. The yield of various millets is in between 2-5 tonnes/ha. Millets play an important role in maintaining the financial status of farmers in the district due to its low cost of cultivation and low water requirements. Since the awareness has increased, importance should be given to increase the area, production and productivity under millets. There is a scope for increasing the productivity of millets through appropriate strategies like Integrated Pest Management and encourage the farmers for millet cultivation by the supply of improved seeds, bio-fertilizers, herbicides, micro nutrient mixtures and farm machineries. Thus, the overall objective is to increase the yield and production of millets through the use of high yielding varieties along with the adoption of the improved technologies.

Project components

1. Distribution of biofertilizers for sorghum to Kadayam, Keelpavoor and Shencottai.
2. Distribution of maize for Kuruvikulam, Kuruvikulam, Melaneelithunur Vasudevanallur.
3. Distribution of herbicides to Kuruvikulam, Manur, Melaneelithunur.
4. Distribution of maize maxim and hybrid seeds of maize for Sankarankoil.
5. Provision of drip irrigation for Kuruvikulam, Melaneelithunur.

Budget

The budget requirement for fulfilling the various interventions is ₹ **367.50** Lakhs.

Expected outcome:

Quality seeds of high yielding varieties will be supplied to enhance the yield potential of the crops. Demonstration of good cultivation practices in the leading farmers land with the help of local extension officials. Will enhance the awareness and adoption of recommended practices. The various millets based food preparation is very popular in the urban areas. Hence, demonstration of various processing and value added products will involve income of millets growers.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.2 Budget requirement for millets in Tirunelveli district

(₹ 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
	Sorghum															
1	Demonstration (Supply of seed, seed treatment, MN mixture & Organic package)	Ha	0.003	Kadyanur, Kilapavoor and Shencottai	150	7.50	150	7.50	150	7.50	150	7.50	150	7.50	750	37.50
	Maize															
2	Demonstration (Supply of seed, seed treatment & MN mixture, organic package)	Ha	0.003	Kuruvikulam, Melaneelithallnur and Vasudevanallur	300	15.00	300	15.00	300	15.00	300	15.00	300	15.00	1500	75.00
3	Distribution of herbicides	Ha	0.008	Kuruvikulam, Melaneelithallnur, Sankarankoil and Vasudevanallur	400	1.20	400	1.20	400	1.20	400	1.20	400	1.20	2000	6.00
4	Distribution of Maize maxim (15 kg/ha)	Ha	0.045	Sankarankoil	100	0.80	100	0.80	100	0.80	100	0.80	100	0.80	500	4.00
5	Drip irrigation for maize	Ha	1	Kuruvikulam, Melaneelithallnur	200	9.00	200	9.00	200	9.00	200	9.00	200	9.00	1000	45.00
6	Seed Distribution Hybrid seeds for maize	MT	1.8	Sankarankoil	100	40.00	100	40.00	100	40.00	100	40.00	100	40.00	500	200.00
	Grand total					73.50		73.50		73.50		73.50		73.50		367.50

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.3 Enhancing pulses productivity in Tirunelveli district

Pulse is one of the major crops of Tirunelveli district. Pulses are grown in an area of 25929 ha. The major pulse crops in the district are black gram and green gram. It is mostly grown in the rice fallows by utilizing the residual moisture. The area and yield under black gram is 19885 ha, 450 kg/ha and green gram is 6014.5 ha, 357 kg/ha respectively. By increasing the productivity in pulses the nutritional security of the district can be ensured. Technological interventions and supply of inputs like high yielding variety seeds, bio-fertilizers, gypsum, rhizobium, herbicides, plant protection chemicals will increase the yield of pulses up to 400-500kg/ha.

Project components

1. Production and distribution of certified seeds and foundation seeds for all blocks.
2. Distribution of bio-fertilizers, herbicides, micronutrients, yellow sticky traps for all blocks.
3. Crop demonstration for the farmers of Kadayanallur, Kuruvikulam, Melaneelithunur, Sankarankoil and Vasudevanallur.

Budget

The budget requirement for fulfilling the various interventions is ₹ **1364.58** Lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.3.

Expected outcome

Increasing the productivity of pulses will help to meet the available required quantity of pulse to the people as per the recommendation of the nutritionists. Increased productivity will also increase the income of the farmers. The encouragement of the adoption of few improved practices in raising pulses will helpful to push up the yield levels.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.3. Budget requirement for Pulses in Tirunelveli district

(₹ 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 B4	1	2.80	1	2.80	1	2.80	1	2.80	1	2.80	6	14.00
2	Production of Foundation/ Certified pulses seeds	MT	86000	All Blocks	76	65.36	76	65.36	76	65.36	77	66.22	78	67.08	383	329.38
3	Distribution of Certified Seeds	MT	100000	All Blocks	76	76.00	76	76.00	76	76.00	77	77.00	78	78.00	383	383.00
4	Distribution of Biofertilizer/ Organic packages (Rhizobium + Phosphobacteria) - Liquid / Carrier	Ha	600	All Blocks	960	5.76	960	5.76	960	5.76	960	5.76	960	5.76	4800	28.80
5	DAP Spray	Ha	700	All Blocks	2250	15.75	2250	15.75	2350	16.45	2450	17.15	2550	17.85	11850	82.95
6	Pulse wonder - 5 kg/ha	Ha	1000	All Blocks	1000	10.00	1000	10.00	1000	10.00	1000	10.00	1000	10.00	5000	50.00
7	Bund Cropping	Ha	300	All Blocks except B14	1000	3.00	1000	3.00	1000	3.00	1000	3.00	1000	3.00	5000	15.00
8	Line sowing	Ha	2250	B8	100	2.25	100	2.25	100	2.25	100	2.25	100	2.25	500	11.25
9	Distribution of Yellow sticky trap /pheromone trap	ha	1000	All Blocks	1050	10.50	950	9.50	950	9.50	950	9.50	950	9.50	4850	48.50
10	Seed treatment and soil application with Trichoderma viridi	Ha	700	All Blocks	2400	16.80	2500	17.50	2500	17.50	2550	17.85	2600	18.20	12550	87.85

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
11	Pure crop demonstration - Black gram and green gram	Ha	6300	B5, B8, B10, B15 and B19	900	56.70	900	56.70	900	56.70	900	56.70	1100	69.30	4700	296.10
12	Seed treatment with chemicals	Ha	250	All Blocks except B2, B3, B4, B6, B7, B8, B9, B11, B13	1500	3.75	1400	3.50	1400	3.50	1400	3.50	1400	3.50	7100	17.75
	Grand total					268.67		268.12		268.82		271.73		287.24		1364.58

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.4 Enhancing oilseeds productivity in Tirunelveli district

In Tirunelveli district oilseed crops are cultivated in around 2819.5 ha. Groundnut and Gingelly are the two major oilseed crops cultivated in an area of 1215.5 and 1107.5 ha respectively. Though the oilseeds are grown in larger area the productivity of the oil seeds are not up to the potential and the yield of groundnut is around 2.7 tonnes/ha and gingelly is 290 kg/ha only. Hence, the implementation of interventions like Introduction of new varieties, supply of inputs like seeds fertilizers and chemicals will increase the production and productivity.

Project components

1. Production and distribution of certified seeds and foundation seeds for all blocks except Ambasamuthram, Cheranmahadevi, Kalakadu, Manur, Mukuddal, Palayamkottai ,
2. Supply of bio-fertilizers and gypsum for Kadayanallur, Kuruvikulam, Melaneelithunur, Sankarankoil, Shencottai, Vasudevanallur.
3. Purchase of breeder seed for all blocks except Cheranmahadevi, Kadayam, Manur.

Budget

The budget requirement for fulfilling the various interventions is ₹**375.03** Lakhs.

Expected Outcome

The oil seed crop area will be increased by the production and distribution of seeds. The productivity of crop is increased by adoption of advanced crop management technologies.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.4. Budget requirement for Oilseeds in Tirunelveli district

(₹ in lakhs)

Sl. No.	Interventions	Unit	Unit Cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
I	OILSEEDS															
1	Purchase of Breeder seed	Mt	1.50	All blocks except B3, B4, B9, B11, B12, B13, B15	3	4.56	3	4.56	3	4.56	3	4.56	3	4.56	15	22.80
II	GROUNDNUT															
2	Strengthening seed chain by foundation seed production	Mt	0.76	All blocks except B2, B3, B6, B9, B11, B13	13	9.88	13	9.88	13	9.88	13	9.88	13	9.88	65	49.40
3	Strengthening seed chain by certified seed production	Mt	0.73	All blocks except B2, B3, B6, B9, B11, B13	32	23.36	32	23.36	32	23.36	32	23.36	32	23.36	160	116.80
4	Distribution of Certified seeds	Mt	0.84	All blocks except B2, B3, B6, B9, B11, B13	32	26.88	32	26.88	32	26.88	32	26.88	32	26.88	160	134.40
5	Distribution of Seed Treatment Chemicals and Bioagents (T.Viridi)	Kg	0.00	B5, B8, B10, B15, B16, B19	270	0.41	270	0.41	270	0.41	270	0.41	270	0.41	1350	2.03
6	Application of Gypsum to Groundnut Crop	Ha	0.02	B5, B8, B10, B15, B16, B19	150	2.40	150	2.40	150	2.40	150	2.40	150	2.40	750	12.00
7	Distribution of Biofertilizer	Ha	0.01	All blocks except B2, B3, B6, B9, B11, B13	280	1.68	280	1.68	280	1.68	280	1.68	280	1.68	1400	8.40
8	Distribution of Liquid	Ha	0.01	All blocks except B2,	280	1.68	280	1.68	280	1.68	280	1.68	280	1.68	1400	8.40

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
	Biofertilizer			B3, B6, B9, B11, B13												
9	Distribution of Light Traps	Nos.	0.02	All blocks except B2, B3, B6, B9, B11, B13	130	2.60	130	2.60	130	2.60	130	2.60	130	2.60	650	13.00
10	Castor as Bund crop	Ha	0.01	All blocks except B2, B3, B6, B9, B11, B13	260	1.56	260	1.56	260	1.56	260	1.56	260	1.56	1300	7.80
	Grand total					75.01		75.01		75.01		75.01		75.01		375.03

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.5. Oil palm

Enhancing the productivity of Oil palm

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

Project components

- Oil palm area expansion programme in Shencottai.
- Provide inputs for intercropping to all blocks.
- Encouraging neem/pungam area expansion programme for all blocks.
- Cultivation maintenance to all blocks.

Budget

It is proposed to incur ₹.322.14 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 in Tirunelveli district

(₹ 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
II	OILPALM															
1	NMOOP -Mini Mission -II (Oilpalm)															
2	Oilpalm Area Expansion Programme	Ha	0.14	B16	0	0.00	0	0.00	0	0.00	0	0.00	1	0.14	1	0.14
3	NMOOP -Mini Mission -III (Tree borne oilseeds)															
4	Neem/ Pungam area expansion programme	Ha	0.2	All Blocks	213	42.60	213	42.60	213	42.60	213	42.60	213	42.60	1065	213.00
5	Cultivation maintenance	Ha	0.05	All Blocks	218	10.90	218	10.90	218	10.90	218	10.90	218	10.90	1090	54.50
6	Inputs for Intercropping	Ha	0.05	All Blocks	218	10.90	218	10.90	218	10.90	218	10.90	218	10.90	1090	54.50
	Grand total					64.40		64.40		64.40		64.40		64.54		322.14

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneeelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.6 Enhancing cotton productivity in Tirunelveli district

Cotton is an important commercial crop which is grown in the black cotton soil areas of the district. In Tirunelveli district cotton crop is grown in an area of 4770 ha and the yield of lint is around 186 kg/ha. It is a highly remunerative crop which requires much care in pest and disease management. The reduction in the area under cotton is mainly due to the increased cost of cultivation because of the high cost of labor and plant protection in the cultivation of cotton. However, adoption of improved package of practices by the farmers with the use of quality seeds, bio-fertilizers and micronutrient mixture, is the important concern for improvement of cotton yield.

Project components

1. Distribution and production of certified seeds in Kuruvikulam, Melaneelithunur, Sankarankoil, Vasudevanallur.
2. Supply of bio-fertilizers, biopesticides to all blocks except Ambasamuthram, Cheranmahadevi, Kadayanallur, Kalakadu, Mukuddal, Radhapuram, Shencottai, Valliyoor.
3. Distribution of yellow sticky traps and MN mixture to Kuruvikulam, Melaneelithunur, Sankarankoil, Vasudevanallur.
4. Promotion of precision farming in cotton at Kuruvikulam, Melaneelithunur, Sankarankoil, Vasudevanallur.

Budget

The budget requirement for fulfilling the various interventions is ₹ **474.22** Lakhs.

Expected Outcome

The implementation of the project will result in an increase of 10 per cent in the yield and production of cotton.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.6. Budget requirement for cotton in Tirunelveli district

(₹ in lakhs)

Sl. No.	Interventions	Unit	Unit cost (in Rs.)	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 biofertilizer	Ha	300	All Blocks except B2, B3, B5, B6, B11, B14, B16 and B18	340	1.02	340	1.02	340	1.02	340	1.02	340	1.02	1700	5.10
2	Distribution of biopesticides / Bio agents	Ha	1000	All Blocks except B2, B3, B5, B6, B11, B14, B16, B18	340	3.40	340	3.40	340	3.40	340	3.40	340	3.40	1700	17.00
3	Distribution of MN Mixture	Ha	1000	B8, B10, B15 B19	200	2.00	200	2.00	240	2.40	0	0.00	0	0.00	640	6.40
4	Distribution of Yellow Sticky trap	No	3000	B8, B10, B15 and B19	200	6.00	200	6.00	200	6.00	200	6.00	200	6.00	1000	30.00
5	Promotion of precision farming in cotton -WSF	Ha	50000	B8, B10, B15 and B19	120	60.00	120	60.00	120	60.00	160	80.00	200	100.00	720	360.00
6	Certified seed production	MT	107900	B8, B10, B15 and B19	5	5.40	5	5.40	5	5.40	5	5.40	5	5.40	25	26.98
7	Distribution of Certified seed	MT	115000	B8, B10, B15 and B19	5	5.75	5	5.75	5	5.75	5	5.75	5	5.75	25	28.75
	Grand total					83.57		83.57		83.97		101.57		121.57		474.23

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.7. Enhancing sugarcane productivity in Tirunelveli district

Sugarcane is grown in an area of 3000 ha and it occupies a less place in the Tirunelveli district in terms of production and productivity. The major varieties grown are COC6304 and COC86032 and the yield is around 64 tonnes/ha. To increase the production and productivity, sustainable sugarcane initiative and enrichment of soil fertility through sugarcane thrash mulching as implemented. Supply of quality sets and implementing sustainable sugarcane initiative are very important to enhance the sugarcane yield in the district.

Project components

1. Trash mulching at Vasudevanallur.
2. Distribution of single bud seedling in Vasudevanallur, Vasudevanallur.
3. Establishment of shade net in Sankarankoil.

Budget

The budget requirement for fulfilling the various interventions is ₹ **68.75** Lakhs.

Expected outcome

Trash mulching techniques will improve the soil health and nutrient status. The timely supply of inputs will increase the production and productivity of sugarcane.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.7. Budget requirement for sugarcane in Tirunelveli district

(₹ 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		
	Sustainable Sugarcane Initiative (SSI)															
1	A. Establishment of Shadenet	Nos	1.5	B15	2	3.00	2	3.00	2	3.00	2	3.00	2	3.00	10	15.00
2	B. Distribution of single bud seedling	Ha	0.225	B15,B19	30	6.75	30	6.75	30	6.75	30	6.75	30	6.75	150	33.75
3	Trash mulching	Ha	0.04	B19	100	4.00	100	4.00	100	4.00	100	4.00	100	4.00	500	20.00
	Grand total					13.75		13.75		13.75		13.75		13.75		68.75

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.8 Enhancing coconut productivity in Tirunelveli district

Coconut is grown in an area of 15712 ha in Tirunelveli district, particularly in kuruvikulam, Naguneri and Pappakudi block and the yield is 10,040 nuts/ ha. The under cultural operations are very difficult because of its tall growing nature. Hence, the introduction of high yielding hybrids (Tall x Dwarf) would add profit and increase the numbers and productivity of coconut trees. There is a scope for 5 percent increase of nuts yield of coconut by developing improved tall varieties or hybrids. Thus the overall objective is to enhance the coconut area and their productivity through the adoption of new hybrids.

Project components

- Distribution of coconut seedlings to all blocks.
- Distribution of MN mixture to all blocks.
- Distribution of pheromone traps for all blocks except Alankulam, Kadayam, Kadayanallur, Keelpavoor, Sankarankoil, Shencottai and Tenkasi.
- Distribution of tree climbers and practicing intercropping with green manures to Manur, Naguneri.
- Corpus fund release for FPG to all blocks.

Budget

The total cost of the project for five years works to ₹ **1854.68** Lakhs.

Expected outcome

The implementation of the project will result in the increase of coconut plantation. This will help to the coconut growing farmers to increase the area and productivity. This will help to improve

the employment opportunity and income of the farming community.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.8. Budget requirement for coconut in Tirunelveli district

(₹ in lakhs)

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Distribution of T x D hybrid seedlings	No	0.0006	All Blocks	24700	14.82	24700	14.82	24700	14.82	24700	14.82	24700	14.82	123500	74.10
2	Distribution of Tall Seedlings	No	0.0004	All Blocks	31700	12.68	24700	9.88	24700	9.88	24700	9.88	24700	9.88	130500	52.20
3	Distribution of D x T hybrid Seedlings	No	0.0015	All Blocks	4750	7.13	4750	7.13	4750	7.13	4750	7.13	4750	7.13	23750	35.63
4	Distribution of MN mixture	Ha	0.1	All Blocks	190	19.00	190	19.00	190	19.00	190	19.00	190	19.00	950	95.00
5	Distribution of Pheromone traps for Red palm weevil/ Rhinoceros beetle	Ha	0.016	All Blocks except B1, B4, B5, B7, B15, B16 ,B17	60	0.96	60	0.96	60	0.96	60	0.96	60	0.96	300	4.80
6	Distribution of tree climbers	No	0.15	B9, B12	4	0.60	4	0.60	4	0.60	4	0.60	4	0.60	20	3.00
7	Intercropping with green manures	Ha	0.03	B9, B12	20	0.60	20	0.60	20	0.60	20	0.60	20	0.60	100	3.00
8	Distribution of coconut seedlings to school children	No	0.0004	All Blocks	13000	5.20	19000	7.60	19000	7.60	19000	7.60	19000	7.60	89000	35.60
9	Control of slug caterpillar	No. of tree	0.0003	B9	500	0.15	1000	0.30	1000	0.30	1000	0.30	1000	0.30	4500	1.35
10	corpus fund release for FPG (2000 nos.)	No	5	All Blocks	62	310.00	58	290.00	62	310.00	66	330.00	62	310.00	310	1550.00
	Grand total					371.14		350.89		370.89		390.89		370.89		1854.68

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.9. Training to farmers

Enhancing the livelihood of farmers through training

Transfer of improved agriculture technologies is effect through the grass root level utilization beyond in this department of Agriculture. Need based training and demonstrating are being regular by extension unless to transfer the technology. The new information that farmers gain through these training sessions makes their daily farming activities much easier. It also leads to an increase in productivity and bigger profits in the long run.

Project components

1. District level trainings to farmers for all blocks.
2. Awareness campaign on improved technologies with the district. Training on recommended cultivation practices of cotton, groundnut, paddy, pulses and sugarcane training on IFS, moisture regular practices, organic form value addition etc., to all blocks
3. Exposure visits on rodent pest management and soil test based nutrient application to all blocks.

Budget

It is proposed to incur ₹. **548.08** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The projects will results better income to farmers. They may learn many things to improve their knowledge on cultivation practices.

Implementing Agency

Department of Agriculture will implement the project

Table 4.9. Budget requirement for training

(₹ in lakhs)

Sl. No.	Cafeteria of Activities	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	District Level															
2	Training of Farmers															
3	Training of 536 Groups of Seed Village Farmers in quality Seed Production technology.	Nos.	0.1	All Blocks	72	7.20	72	7.20	72	7.20	72	7.20	72	7.20	360	36.00
4	Training of Farmers under Mission Soil Health Card	Nos.	0.15	All Blocks	72	10.80	72	10.80	72	10.80	72	10.80	72	10.80	360	54.00
5	With in the district training of Farmers	Nos.	0.1	All Blocks	74	7.40	74	7.40	74	7.40	74	7.40	72	7.20	368	36.80
6	With in the State training of Farmers	Nos.	1.2	All Blocks		0.00		0.00		0.00		0.00	72	86.40	72	86.40
Training of Farmers With in the district																
7	Awareness campaigns	Nos.	0.1	All Blocks	37	3.70	37	3.70	37	3.70	37	3.70	72	7.20	220	22.00
8	Cotton	Nos.	0.1	All Blocks		0.00		0.00		0.00		0.00	72	7.20	72	7.20
9	Groundnut	Nos.	0.1	All Blocks		0.00		0.00		0.00		0.00	72	7.20	72	7.20
10	IFS	Nos.	0.1	All Blocks	74	7.40	74	7.40	74	7.40	74	7.40	72	7.20	368	36.80
11	Major & Minor Millets	Nos.	0.1	All Blocks	7	0.70	7	0.70	7	0.70	7	0.70	72	7.20	100	10.00
12	Moisture conservation practices	Nos.	0.1	All Blocks		0.00		0.00		0.00		0.00	72	7.20	72	7.20
13	Oil palm	Nos.	0.1	All Blocks		0.00		0.00		0.00		0.00	72	7.20	72	7.20
14	Organic cultivation practices	Nos.	0.1	All Blocks	70	7.00	70	7.00	70	7.00	70	7.00	72	7.20	352	35.20
15	Paddy	Nos.	0.1	All Blocks	74	7.40	74	7.40	74	7.40	74	7.40	72	7.20	368	36.80

Sl. No.	Cafeteria of Activities	Unit	Unit Cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
16	Pulses	Nos.	0.1	All Blocks	37	3.70	37	3.70	37	3.70	37	3.70	72	7.20	220	22.00
17	Sugarcane	Nos.	0.1	All Blocks		0.00		0.00		0.00		0.00	72	7.20	72	7.20
18	Value addition training	Nos.	0.1	All Blocks	6	0.60	6	0.60	6	0.60	6	0.60	72	7.20	96	9.60
19	Exposure visit of farmers		0.4	All Blocks		0.00		0.00		0.00		0.00	72	28.80	72	28.80
20	Rodent Pest Management Demonstration	Nos.	0.04	All Blocks		0.00		0.00		0.00		0.00	72	2.88	72	2.88
21	With in State Exposure visit	Nos.	0.4	All Blocks		0.00		0.00		0.00		0.00	72	28.80	72	28.80
22	Organisation of Kisan gosthies on Soil test based nutrient application (Campaign)	Nos.	0.15	All Blocks	37	5.55	37	5.55	37	5.55	37	5.55	72	10.80	220	33.00
23	With in the district exposure visit	Nos.	0.15	All Blocks	37	5.55	37	5.55	37	5.55	37	5.55	72	10.80	220	33.00
	Grand total					67.00		67.00		67.00		67.00		280.08		548.08

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.10. Infrastructure

Facilities for seed production

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

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

Establishment of laboratories

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

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

The major interventions are

1. Distribution of bag closure for all blocks.
2. Construction of Uzhavar Maiyam/Farmers Hub for Palayamkottai
3. Distribution of dunnage, Electronic platform balance, tarpaulins, seed rack and Moisture meter for all blocks.
4. Establishment of Thrashing floor/drying yard for Kalakadu, Manur, Palayamkottai, Radhapuram and Valliyoor.

Budget

It is proposed to incur ₹. **1427.30** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The projects will provide better infrastructure facility to farmers.

Implementing Agency

Department of Agriculture will implement the project.

Table 4.10. Budget requirement for Infrastructure

(₹ in lakhs)

Sl. No.	Interventions	Unit	Unit Cost (in Rs.)	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 Uzhavar Maiyam (Farmers Hub)	Nos.	1500000	B13	1	150.00	0	0.00	0	0.00	0	0.00	0	0.00	1	150.00
2	Establishment of Threshing floor/drying yard	Nos.	500000	B6, B9, B13, B14 and B18	10	50.00	10	50.00	10	50.00	10	50.00	10	50.00	50	250.00
3	Dunnage	Nos.	7500	All Blocks	190	14.25	190	14.25	190	14.25	190	14.25	190	14.25	950	71.25
4	Moisture meter	Nos.	25000	All Blocks	65	16.25	0	0.00	0	0.00	0	0.00	0	0.00	65	16.25
5	Bag closure	Nos.	10000	All Blocks	42	4.20	42	4.20	12	1.20	12	1.20	12	1.20	120	12.00
6	Electronic platform balance	Nos.	150000	All Blocks	57	85.50	42	63.00	0	0.00	0	0.00	0	0.00	99	148.50
7	Seed rack	Nos.	30000	All Blocks	57	17.10	57	17.10	57	17.10	0	0.00	0	0.00	171	51.30
8	Tarpaulin	Nos.	25000	All Blocks	38	9.50	38	9.50	38	9.50	0	0.00	38	9.50	152	38.00
9	Office Furnishings and other amenities	Nos.	200000	All Blocks	19	38.00	19	38.00	19	38.00	13	26.00	0	0.00	70	140.00
10	Strengthening of training institute / nursery / FTC / KVK	Nos.	5000000	All Blocks	0	0.00	0	0.00	1	500.00	0	0.00	0	0.00	1	500.00
11	Infrastructure for empowerment of coconut nurseries	Nos.	5000000	All Blocks	0	0.00	0	0.00	0	0.00	1	50.00	0	0.00	1	50.00
	Grand total					384.80		196.05		630.05		141.45		74.95		1427.30

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayannallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.11. Soil Health Management

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

Project Component:

- Procurement and distribution of blue green algae and green manuring to all blocks.
- Composting of farm waste through *pluerotus* in all blocks.
- Distribution of soil health card for all blocks.

Budget:

Enhancing soil health by distributing enriched farm yard manure, micro-nutrient mixture, gypsum, bio-fertilizers, *etc.* is essential to maximize profitability. The overall budget to undertake the various interventions in Tirunelveli district is ₹. **134. 94** lakhs.

Expected Outcome:

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

Implementing Agency:

The projects will be implemented by the Department of Agriculture.

Table 4.11. Budget requirement for Soil Health Management

(₹ in lakhs)

Sl. No.	Interventions	Unit	Unit cost (in Rs.)	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Soil Health Management															
1	Green manuring	Nos	4000	All Blocks	2	0.08	2	0.08	2	0.08	0	0.00	0	0.00	6	0.24
2	Procurement and distribution of Blue Green Algae	Nos	2500	All Blocks	138	3.45	39	0.98	55	1.38	56	1.40	56	1.40	344	8.60
3	Composting of farm waste through pluerotus (production and distribution of kits)	MT	200	All Blocks	265	0.53	200	0.40	200	0.40	200	0.40	200	0.40	1065	2.13
4	Strengthening of Four Soil survey and Land Use Organization Units Vellore, Coimbatore, Tirunelveli and Thanjavur	Ha	1125000	B12	3	33.75	2	22.50	2	22.50	2	22.50	2	22.50	11	123.75
5	Distribution of Soil Health Card	Ha	300	All Blocks	15	0.05	15	0.05	15	0.05	15	0.05	15	0.05	75	0.23
	Grand total					37.86		24.00		24.40		24.35		24.35		134.95

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.12. 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 in rainfed area 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

Project components

- Promotion of Farmers club for sustainable dry land agriculture in Melaneelithunur, Kuruvikulam, and Sankarankoil.

Budget

It is proposed to incur ₹. **3312.71** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The project will increase the production of rainfed crops which will improve the income of the farmers practicing normal agriculture.

Implementing Agency

Department of Agriculture will implement the project

Table 4.12. Budget requirement for Rainfed Area Development

(₹ in lakhs)

SI. No.	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Promotion of Farmers club for Sustainable Dryland Agriculture	Cluster	84.9415	B10, B15, B8	3	254.82	13	1104.24	13	1104.24	10	849.42	0	0	39	3312.72
	Grand total					254.82		1104.24		1104.24		849.42		0		3312.72

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.13. Strengthening of State Seed Farm

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

Project components

Soil fertility improvement and land development works

- Provision of Irrigation facilities viz., New bore well with EB connection, Deepening of open well at Palayamkottai.
- Supply of machineries such as dunnage in Palayamkottai

Budget

It is proposed to incur ₹. 42.25 lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The project will enhance a production of quality seeds of crop varieties and ensure timely delivery of seeds to farmers and it will increase the supply of good quality seed which increase the production of the crops and increase the income of the farmers of Tamil Nadu.

Implementing Agency

Department of Agriculture will implement the project.

Table 4.13. Budget requirement for SSF

(₹ in lakhs)

Sl. No.	Interventions	unit	unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
I	Soil fertility improvement and land development works in SSF															
II	Irrigation component															
1	New bore well with EB connection	Nos	8	Palayamkottai	3	24.00	0	0.00	0	0.00	0	0.00	0	0.00	3	24.00
2	Deepening of open well	Nos	8	Palayamkottai	2	16.00	0	0.00	0	0.00	0	0.00	0	0.00	2	16.00
III	Machineries															
3	Dunnage (Poly Pallets)	Nos	0.075	Palayamkottai	30	2.25	0	0.00	0	0.00	0	0.00	0	0.00	30	2.25
	Grand total					42.25		0.00		0.00		0.00		0.00		42.25

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.14. Machineries

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 Tirunelveli district.

Project Component:

- Distribution of tractor, mini tractor and power tiller in Manur, Palayamkottai and Vasudevanallur.
- Distribution of rotavator in all blocks except Cheranmahadevi and Mukuddal.
- Distribution of paddy transplanter in Manur, Palayamkottai, Sankarankoil and Vasudevanallur.
- Distribution PVC pipes to carry irrigation water from source to field to all blocks except Sankarankoil.
- Distribution of solar light trap in all blocks.

Budget:

Agricultural mechanization programs are proposed to implement in a big way to increase the agricultural production and to popularize the agricultural machinery among the farmers of this district with a budget of **₹.1541.20** 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 engineering.

Table 4.14. Budget requirement for machineries

(₹ 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	Solar light trap	No.	4000	All Blocks	950	38.00	950	38.00	950	38.00	950	38.00	950	38.00	4750	190.00
2	Distribution of Mini Tractor	Nos	300000	Manur, Palayamkottai and Vasudevanallur	9	27.00	9	27.00	9	27.00	9	27.00	9	27.00	45	135.00
3	Distribution of Paddy transplanter	Nos	1200000	Manur, Palayamkottai, Shankarankoil and Vasudevanallur	9	45.00	9	45.00	9	45.00	9	45.00	9	45.00	45	225.00
4	Distribution of Powertiller	Nos	150000	Kalakadu, Manur, Palayamkottai and Vasudevanallur	21	31.50	21	31.50	21	31.50	21	31.50	21	31.50	105	157.50
5	Distribution of Rain guns	Ha	40000	Sankarankoil	7	2.10	7	2.10	7	2.10	7	2.10	7	2.10	35	10.50
6	Distribution of Rotavator	Nos	80000	All Blocks except Cherai and Mukuddal	72	57.60	73	58.40	73	58.40	73	58.40	73	58.40	364	291.20
7	Distribution of Tarpaulins	Nos	8000	All Blocks	250	20.00	250	20.00	250	20.00	250	20.00	250	20.00	1250	100.00
8	Distribution of Tractor	Nos	600000	Manur, Palayamkottai and Vasudevanallur	8	48.00	8	48.00	8	48.00	8	48.00	8	48.00	40	240.00
9	PVC Pipes to carry Irrigation water from source to field	Unit	40000	All Blocks except Sankarankoil	96	38.40	96	38.40	96	38.40	96	38.40	96	38.40	480	192.00
	Grand total					307.60		308.40		308.40		308.40		308.40		1541.20

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.1.15. Information Technology in Agriculture

Agriculture is a major sector which is vital for the survival of modern man. The produce from agriculture drives trade from one country to another, brings income for farmers, makes productive use of otherwise idle land, and brings food on the table. It is such an important part of everyone's daily life, although it may not be seen as a direct factor since the produce goes a long way before reaching the hands of everyone who benefits from it.

Role of IT in Agriculture

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

Project components

- Procurement of hardware for replacement of old hardware in all blocks.
- Distribution of Xerox machine, 4G internet, laptop, UPS and electrical accessories for all blocks.
- Provide handycam, GPS instrument, android mobile, LCD, AC room for all blocks.

Budget

It is proposed to incur ₹. **190.92** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

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

Implementing Agency

Department of Agriculture will implement the project

Table 4.15. Budget requirement for IT

(₹ in lakhs)

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Procurement of hardware for replacement of old hardware	Nos	50000	All Blocks	19	9.50	0	0.00	0	0.00	0	0.00	0	0.00	19	9.50
2	Connectivity charges	Nos	11000	All Blocks	19	2.09	0	0.00	0	0.00	0	0.00	0	0.00	19	2.09
3	Printer cum scanner	Nos	20000	All Blocks	19	3.80	0	0.00	0	0.00	0	0.00	0	0.00	19	3.80
4	UPS and electrical accessories	Nos	35000	All Blocks	19	6.65	0	0.00	0	0.00	0	0.00	0	0.00	19	6.65
5	Xerox machine	Nos	75000	All Blocks	19	14.25	0	0.00	0	0.00	0	0.00	0	0.00	19	14.25
6	Laptop/Desktop	Nos	50000	All Blocks	57	28.50	0	0.00	0	0.00	0	0.00	0	0.00	57	28.50
7	Anti-virus software	Nos	2500	All Blocks	114	2.85	0	0.00	0	0.00	0	0.00	0	0.00	114	2.85
8	Television	Nos	100000	All Blocks	19	19.00	0	0.00	0	0.00	0	0.00	0	0.00	19	19.00
9	Colour printer	Nos	15000	All Blocks	19	2.85	0	0.00	0	0.00	0	0.00	0	0.00	19	2.85
10	4G Internet - Dongle	Nos	2500	All Blocks	57	1.43	0	0.00	0	0.00	0	0.00	0	0.00	57	1.43
11	Equipments for Documentation															
a	Handycam	Nos	30000	All Blocks	19	5.70	0	0.00	0	0.00	0	0.00	0	0.00	19	5.70
b	Camera	Nos	25000	All Blocks	19	4.75	0	0.00	0	0.00	0	0.00	0	0.00	19	4.75
c	GPS instrument	Nos	20000	All Blocks	57	11.40	0	0.00	0	0.00	0	0.00	0	0.00	57	11.40
d	Android mobile	Nos	15000	All Blocks	57	8.55	0	0.00	0	0.00	0	0.00	0	0.00	57	8.55
e	External hard disk	Nos	5000	All Blocks	19	0.95	0	0.00	0	0.00	0	0.00	0	0.00	19	0.95
	LCD projector	Nos	75000	All Blocks	19	14.25	0	0.00	0	0.00	0	0.00	0	0.00	19	14.25
	pico Projector	Nos	35000	All Blocks	18	6.30	18	6.30	18	6.30	18	6.30	0	0.00	0	25.20
13	Air conditioner for computer room	Nos	40000	All Blocks	19	7.60	18	7.20	18	7.20	18	7.20	0	0.00	73	29.20
	Grand total					150.42		13.50		13.50		13.50		0.00		190.92

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

Table 4.16. Budget abstract for Agriculture Sector

(₹ in Lakhs)

Sl. No.	Crops	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Paddy	980.94	890.09	911.29	931.09	948.54	4661.95
2	Millets	73.50	73.50	73.50	73.50	73.50	367.50
3	Pulses	268.67	268.12	268.82	271.73	287.24	1364.58
4	Oilseeds	75.01	75.01	75.01	75.01	75.01	375.03
5	Oilpalm	64.40	64.40	64.40	64.40	64.54	322.14
6	Cotton	83.57	83.57	83.97	101.57	121.57	474.23
7	Sugarcane	13.75	13.75	13.75	13.75	13.75	68.75
8	Coconut	371.14	350.89	370.89	390.89	370.89	1854.68
9	Training	67.00	67.00	67.00	67.00	280.08	548.08
10	Infrastructure	384.80	196.05	630.05	141.45	74.95	1427.30
11	Soil Health Management	37.86	24.00	24.40	24.35	24.35	134.95
12	Rainfed Area Development	254.82	1104.24	1104.24	849.42	0.00	3312.72
13	Integrated Pest Management	0.00	0.00	0.00	0.00	0.00	0.00
14	Farm Mechanization	307.60	308.40	308.40	308.40	308.40	1541.20
15	Strengthening of State Seed Farm	42.25	0.00	0.00	0.00	0.00	42.25
16	Agriculture Information Technology	150.42	13.50	13.50	13.50	0.00	190.92
	Grand total	3175.73	3532.52	4009.22	3326.06	2642.82	16686.28

4.1.17. Strengthening of research infrastructure for agriculture sector in Tirunelveli District

1. Establishment of Training Institute at Citrus Research Station, Sankarankoil

Acid lime is an important commercial species of citrus family indigenous to India. Farmers are earning low income at present even though acid lime is a most preferred fruit crop by the farmers of Tamil Nadu having areas with good drainage, medium soil depth and moderate quality of irrigation water. The factors like poor soil, poor irrigation water, moderate rainfall, moderate to harsh climate, seedlings of varieties of unknown lineage (mostly seedlings from village markets) and less intensive management practices are the reasons for the present position of production which is nearly below all India average. In this regard setting up of training institute at Citrus Research Station, Sankarankoil with the proposed budget of Rs. **100.00** Lakhs. will be of immense use in changing the economic and social status of the citrus farmers, skilled workers, rural women and rural youth.

2. Establishment of Research laboratories at Sankarankoil

Research laboratory is used to generate information which addresses critical problems in agriculture leading to the development of innovative solutions which increase the efficiency of agriculture systems and reduce production as well as environmental risk. It provides a wide range of testing for soils, water, plants, biosolids and other agricultural materials and also to promote practical, innovative, and affordable solutions to existing and emergent issues related to nutrient management and environment. The research laboratory offers comprehensive analyses of soil, water, plant tissue, manure, compost, and other agricultural materials. The proposed budget for the above intervention is Rs. **30.00** lakhs.

3. Establishment of Fruit Processing Unit at Sankarankoil

Processing is one of the most effective solutions to reduce wastage. In India processing of fruits and vegetables is extremely low and is below 2%. Value addition to the raw produce is only 7% compared to as much as 23% in China, 45% the Philippines and 88% the UK. Thus, the processing industry holds tremendous potential not only for contributing to the GDP but also for generating employment in rural areas and business opportunities for entrepreneurs. There are various fruit processing technologies such as canning, dehydration, pickling, provisional preservation, bottling etc., With the advent of technology and preservatives, shelf life of such products has gone up and they can be preserved for many months with proper packing. The proposed budget for the above intervention is Rs. **50.00** lakhs.

4. Construction of Communication lab at Sankarankoil

The Communication Lab offers individual coaching, targeted workshops, and a spectrum of initiatives to support students as they learn key transferable communication skills that will help them achieve their career goals. The purpose of the communication lab is to reinforce what the students are learning in class and to help them reach their cognitive, affective and behavioral goals. To improve the communication between the students by construction of communication lab with an estimated budget of Rs. **10.00** lakhs.

5. Establishment of Gardens and farms at Sankarankoil

Gardening is the practice of growing and cultivating plants as part of horticulture. In gardens, ornamental plants are often grown for their flowers, foliage, or overall appearance. Useful plants, such as root vegetables, leaf vegetables, fruits, and herbs, are grown for consumption, for use as dyes, or for medicinal or cosmetic use. Gardening is considered to be a relaxing activity for many people. Gardening ranges in scale from fruit orchards, to long boulevard plantings with one or more different types of shrubs, trees, and herbaceous plants, to residential yards including lawns and foundation plantings, to plants in large or small containers grown inside or outside. The proposed budget of above intervention is Rs. **25.00** lakhs.

6. Construction of Seed Storage Godowns at Sankarankoil

Storage is an important marketing function, which involves holding and preserving goods from the time they are produced until they are needed for consumption. The storage of goods ensures a continuous flow of goods in the market. Storage protects the quality of perishable and semi-perishable products from deterioration. Some of the goods have a seasonal demand. To cope with this demand, production on a continuous basis and storage become necessary. It helps in the stabilization of prices by adjusting demand and supply. A storage godown is necessary and the proposed budget of above intervention is Rs. **10.00** lakhs.

Budget

It is proposed to incur Rs.**225.00** lakhs over a period of five years

Expected outcome

It will improve the income of the farmers.

Implementing agency

Tamil Nadu Agricultural University implement the project.

Table 4.17 . Budget for Agricultural Research infrastructure in Tirunelveli district

(₹ in lakhs)

Sl. No.	Interventions	Blocks Covered	Unit Cost in lakhs	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
				Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
I	Research Infrastructure														
1	Establishment of Training Institute at Citrus Research Station, Sankarankoil	Sankarankoil	100	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
2	Establishment of Research laboratories	Sankarankoil	10	1	10.00	1	10.00	1	10.00	0	0.00	0	0.00	3	30.00
3	Establishment of Fruit Processing Unit	Sankarankoil	50	1	50.00	0	0.00	0	0.00		0.00	0	0.00	1	50.00
4	Construction of Communication lab	Sankarankoil	10	0	0.00	1	10.00	0	0.00	0	0.00	0	0.00	1	10.00
5	Establishment of gardens and farms	Sankarankoil	25	0	0.00	0	0.00	1	25.00	0	0.00	0	0.00	1	25.00
6	Establishment of seed storage godowns	Sankarankoil	10	0	0.00	0	0.00	0	0.00	1	10.00	0	0.00	1	10.00
	Grand total				160.00		20.00		35.00		10.00		0.00		225.00

4.2 Horticulture sector

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 products. The farmers are ready to go in for the cultivation of horticultural crops which prove remunerative. The challenge lies in transferring 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 production can be increased by promotion of cultivation of fruit crops in the potential areas.

Project components

- Area expansion of banana, banana leaf production, normal planting of mango in all blocks except Alankulam.
- Enhance HDP in mango, guava, litchi, pomegranate, traditional planting of fruits, and normal planting of lime, Palmyra and commercial production of traditional fruits in all blocks.
- Enhance commercial production of choice fruit at Shencottai and Tenkasi.

b. Vegetable crops

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

Project components

- Area expansion of brinjal, bhendi, tomato and commercial production of location specific vegetables in all blocks.
- Area expansion of small onion in Alankulam, Kadayanallur, Keelpavoor, Kuruvikulam, Manur and Sankarankoil.
- Area expansion of bellary onion in Alankulam, Kadayam, Kadayanallur, Keelpavoor, Kuruvikulam.
- Enhancing tapiaco production at Shencottai, Tenkasi.

c. Flower crops

The major flowers grown are Gundumalli, Mullai, Rose, Crossandra, Chrysanthemum, Marigold, Tuberose, Arali and Jathimalli. Floriculture activity has evolved as a viable and profitable alternative, with a potential to generate remunerative self-employment among small and 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, enhancing area of cultivation of traditional and cut flowers are planned.

Project components

- Enhancing flower production of loose flowers like jasminum, crossandra, marigold, rose, chrysanthemum, nerium in all blocks.
- Provide cost of planting material for rose, liliium under protected cultivation in Kadayanallur and Shencottai.

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.

Project components

- Area expansion of seed and rhizomatic spices in all blocks except Cheranmahadevi, Kadayam, Kalakadu, Keelpavoor, Manur, Nagureri, Palayamkottai.
- Enhance the perennial spice crop in all blocks.

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

Project components

- Enhancing the production of cocoa plantation in Kadayam, Kadayanallur, Kalakadu, Keelpavoor, Radhapuram, Shencottai and Tenkasi.
- Area expansion of cashew in all blocks except Ambasamuthram, Kuruvikulam.
- Encouraging coconut production in all blocks.
- Area expansion of bamboo and other crops in all blocks except Alankulam, Cheranmahadevi and Kadayam.

Improving Infrastructural facilities for production

To increase the income of the horticultural farmers, support for the establishment of pandals, trellies, staking and propping polygreen houses, (tubular structure) have to be provided. Vegetables like bitter gourd, snake gourd, ribbed gourd, pandal avarai, pole beans,

tomato, cucumber, squash and in fruits grapes, musk melons and in spices pepper etc could be cultivated under pandal cultivation. Similarly, crops like peas, musk melon, pole beans, tomatoes, ivy gourd could be raised in trellies. High value vegetables like capsicum, beans and flowers like carnation, roses etc could be raised in poly houses.

Project components

- Establishment of poly green house in all blocks except Ambasamuthram.
- Installation of shadenet in all blocks.
- Provide permanent pandal for aforesaid crops in all blocks.

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.

Project components

- Rejuvenation of anti-bird net in Shencottai and Tenkasi.

Organic farming

Organic farming is an alternative agricultural system which originated early in the 20th Century in reaction to rapidly changing farming practices. It relies on fertilizers of organic origin such as compost, manure, green manure, and bone meal and places emphasis on techniques such as crop rotation, companion planting, biological pest control, mixed cropping and fostering of insect predators are encouraged. Since 1990, the market for organic food and other products has grown rapidly, reaching \$63 billion worldwide in 2012. This demand

has driven a similar increase in organically managed farmland that grew from 2001 to 2011 at a compounding rate of 8.9 per cent per annum. As of 2011, approximately 3.70 lakh hectares worldwide were farmed organically, representing approximately 0.9 per cent of total world farmland. Organic farming encourages crop diversity. The science of agro ecology has revealed the benefits of polyculture (multiple crops in the same space), which is often employed in organic farming. Planting a variety of vegetable crops supports a wider range of beneficial insects, soil microorganisms, and other factors that add up to overall farm health. Crop diversity helps environments thrive and protects species from going extinct. The profitability of organic agriculture can be attributed to a number of factors. First, organic farmers do not rely on synthetic fertilizer and pesticide inputs, which can be costly. In addition, organic foods currently enjoy a price premium over conventionally produced foods, meaning that organic farmers can often get more for their yield.

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

Project components

- Enhancing organic farming in 50 acre cluster for Cheranmahadevi, Kadayanallur, Kalakadu, Papakudii.
- Establishment of HDPE vermibed in all blocks.

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.

Project components

- Establishment of pack house in all blocks.
- Construction of low cost onion structure in Alankulam, Kadayanallur, Keelpavoor, Shencottai, Tenkasi.
- Construction of collection Centre and retail outlet in Keelpavoor.

Capacity building

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.

Project components

- Giving training to within the state at HTC, 5 days exposure visit, arranging district level seminar, exposure visit outside India in all blocks.
- Provide training to outside the state in Cheranmahadevi.
- Provide training to staff outside India in Alankulam, Ambasamuthram, Cheranmahadevi, Kadayam and Tenkasi.

Bee Keeping

Production of apiary honey in the country reached 10,000 tons, valued at about Rs.300 million. Bee-Keeping Industry is one of the important activities. The Government provides financial support to this Industry by way of providing grant for supply of bee-hives to the Tribal on hill areas, Scheduled Castes /Scheduled Tribes under Western Ghats Development Programmes, Hill Area Development Programme and Integrated Tribal Development Programme. The income earned by the farmers through bee-keeping activities is an additional income to their agriculture income. Honey industry in the country can well become a major foreign exchange earner if international standards are met. Beekeeping is an age-old tradition in India but it is considered a no-investment profit giving venture in most areas. Of late, it has been recognized that it has the potential to develop as a prime agri-

horticultural and forest-based industry. Honey production is a lucrative business and it generates employment.

Apiary honey is produced in bee hives and is harvested by extraction through honey extractors. Other types of beekeeping equipment like queen excluder, smoker, hive tool, pollen trap and honey processing plant are also used. Indian honey has a good export market. With the use of modern collection, storage, beekeeping equipment, honey processing plants and bottling technologies, the potential export market can be tapped.

Project components

- Installation of bee hive and colony in all blocks.
- Distribution of honey extractor in all blocks.

Mechanization in cultivation of horticultural crops

Mechanization encourages large scale production and improves the quality of farm produce. It ensures reduction of drudgery associated with variety of farm operations and also encourages the utilization of input and thereby harnessing the potential of available resources. Provision of power operated machineries and tools including power operated saw and plant protection equipment's, power machines with Rotavator / equipment, power machines including accessories and equipment would strengthen the infrastructural facilities.

Project components

- Distribution of power tiller/tractor/ minitractor and plastic crates for all blocks.
- Distribution of manual sprayer in Ambasamuthram.
- Distribution of hand operated sprayer in all blocks except Alankulam.
- Distribution of power operated sprayer in all blocks.

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, In situ water conservation and the like.

Project components

- Installation of micro drip, rain gun, sprinkler for all blocks.
- Distribution of water harvesting system for individuals in all blocks.

Special Interventions

Enhancing Banana Bunch Sleeve for Ambasamuthram

'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 scotch). 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.

Agro Ecosystem Analysis (AESA) based IPM at Ambasamuthram

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. In AESA based IPM emphasis is given to natural enemies, plant compensation ability, abiotic factors and P: D ratio.

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.

Project components

- Taking care of farm deficiency correction, promote roof top garden kit with and without shade net in all blocks.

Establishment of Mushroom unit

Mushrooms have been valued throughout the world as both food and medicine for thousands of years. They are a rich source of nutrition and form a major chunk of health foods. Earlier mushroom eating was restricted to specific regions and areas of the world but due to globalization, interaction between different cultures, growing consumerism has ensured the accessibility of mushrooms in all areas. Mushrooms are increasingly gaining acceptance in different Cuisines and in everyday consumption. They have created a space in a common man's kitchen. Also, current trend of consumption conveys the opportunity that lies in the area of mushroom exports.

Project components

- Establishment of cottage mushroom unit in Kalakadu.

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.

Project components

- Developing IFS based farming in Kuruvikulam, Manur, Melaneelithunur, Vasudevanallur,

Coastal area development programme

The coastal area in Tamil Nadu is susceptible to cyclones periodically, which cause damage to life and property. The coastal area supports several important economic activities such as fisheries, ports, industries and tourism. Most ecologically critical and threatened areas in the coastal areas are coastal wet lands especially lagoons and estuaries and their mangrove swamps. The coastal areas provide food and shelter for waterfowls, fishes, crustaceans, molluscs including some of the world’s lucrative fisheries. Mangroves and coral reef system are important for protecting shorelines and coastal lines against erosion. Thus coastal areas play a prominent role in the human life.

Providing Crop Insurance for all blocks

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.

Budget

The budget requirement for fulfilling the various interventions is ₹ **18693.24** Lakhs.

Implementing agency

The projects will be implemented by the Department of Horticulture.

Table 4.18. Budget requirement for horticulture interventions in Tirunelveli district

(₹ 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															
I	Area expansion of fruit crops															
1	Grapes	Ha	1.25	B5	5	6.25	5	6.25	5	6.25	5	6.25	5	6.25	25	31.25
2	Banana / Hill Banana sucker & Pine apple sucker	Ha	0.875	All Blocks except B1	275	240.63	275	240.63	275	240.63	275	240.63	275	240.63	1375	1203.13
3	HDP in Mango, Guava, Litchi, Pomegranate	Ha	1	All Blocks	130	130.00	130	130.00	130	130.00	130	130.00	130	130.00	650	650.00
4	Area expansion fruits with traditional varieties	Ha	0.6	All Blocks	40	24.00	40	24.00	40	24.00	40	24.00	40	24.00	200	120.00
5	Normal Planting in lime / lemons	Ha	0.6	All Blocks	133	79.80	133	79.80	133	79.80	133	79.80	133	79.80	665	399.00
6	Normal Planting in Mango	Ha	0.6	All Blocks except B1	46	27.60	46	27.60	46	27.60	46	27.60	46	27.60	230	138.00
7	Normal planting in Guava	Ha	0.6	All Blocks except B1, B2	17	10.20	17	10.20	17	10.20	17	10.20	17	10.20	85	51.00
8	Normal planting in Amla	Ha	0.6	B1, B2, B7, B9, B10, B11	26	15.60	26	15.60	26	15.60	27	16.20	27	16.20	132	79.20
9	Banana for leaf production	Ha	0.6	All Blocks except B1	54	32.40	54	32.40	54	32.40	54	32.40	54	32.40	270	162.00
10	Area expansion under Palmyrah,	Ha	0.6	All Blocks	68	40.80	68	40.80	68	40.80	68	40.80	68	40.80	340	204.00
11	Commercial production of choice fruits	Ha	1.25	B16,B17	10	12.50	10	12.50	10	12.50	10	12.50	10	12.50	50	62.50

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
	(Kiwi, Mangoosteen, Rambutan, Fig, Date palm, Durian, Carambola, Dragon fruit, Passion Fruit, Kiwi, Grapes, Strawberry, etc..)															
12	Commercial production of Traditional fruits (Woodapple, Manila Tamarind, Jamun, Ber, Karonda, Annona, Egg fruit, etc..)	Ha	0.6	All Blocks	23	13.80	23	13.80	23	13.80	23	13.80	23	13.80	115	69.00
II	Area expansion of vegetable crops															
13	Brinjal	Ha	0.5	All Blocks	93	46.50	91	45.50	94	47.00	94	47.00	94	47.00	466	233.00
14	Bhendi	Ha	0.5	All Blocks	136	68.00	108	54.00	108	54.00	108	54.00	108	54.00	568	284.00
15	Green Chillies	Ha	0.5	B1	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
16	Tomato	Ha	0.5	All Blocks	88	44.00	79	39.50	79	39.50	79	39.50	79	39.50	404	202.00
17	Gourds including pumpkin and tinda	Ha	0.5	All Blocks	85	42.50	90	45.00	90	45.00	90	45.00	90	45.00	445	222.50
18	Small Onion	Ha	0.5	B1, B5, B7, B8, B9, B15	75	37.50	75	37.50	75	37.50	75	37.50	75	37.50	375	187.50
19	Bellary Onion	Ha	0.5	B1, B4, B5, B7, B8, B13, B16	390	195.00	390	195.00	390	195.00	390	195.00	390	195.00	1950	975.00

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
20	Cucumber /gherkin	Ha	0.5	All Blocks except B6, B7, B8, B9, B10, B11	61	30.50	56	28.00	56	28.00	56	28.00	56	28.00	285	142.50
21	Melons	Ha	0.5	B11	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
22	Tapioca	Ha	0.5	B16,B17	45	22.50	45	22.50	45	22.50	45	22.50	45	22.50	225	112.50
23	Yams and colacassia	Ha	0.5	B2, B4, B13, B14, B16, B17, B19	100	50.00	120	60.00	120	60.00	120	60.00	120	60.00	580	290.00
24	Commercial production of location specific traditional vegetables (Athalakkai, Palu Pavakkai, Mullu kathiri, Poiyur kathiri, Kottapatti kathiri etc.,)	Ha	0.5	All Blocks	24	12.00	24	12.00	24	12.00	24	12.00	24	12.00	120	60.00
III	Area expansion of Medicinal and Aromatic plants															
25	Aloe vera	Ha	0.508 1	B2	1	0.51	1	0.51	1	0.51	1	0.51	1	0.51	5	2.54
26	Neem	Ha	0.448 3	All Blocks	38	17.04	38	17.04	38	17.04	38	17.04	38	17.04	190	85.18
27	Amla	Ha	0.777 1	B3, B4, B5, B6	25	19.43	25	19.43	25	19.43	25	19.43	25	19.43	125	97.14
28	Senna	Ha	0.298 8	B9	10	2.99	10	2.99	10	2.99	10	2.99	10	2.99	50	14.94
IV	Area expansion of Spices crops															
29	Seed and Rhizomatic	Ha	0.3	All Blocks except B3,	165	49.50	165	49.50	165	49.50	165	49.50	165	49.50	825	247.50

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
	spices (Coriander, Turmeric, Ginger, Dry Chilly, Cumin, Fennel, Fenu greek, Dil, Cardamom etc..)			B4, B6, B7, B11, B12, B13												
30	Perennial spices (Pepper, Curry leaf, All spice, Cinnamon, Clove, Tamarind, Nut meg etc..)	Ha	0.5	All Blocks	28	14.00	28	14.00	28	14.00	28	14.00	28	14.00	140	70.00
V	Area expansion of Flower crops															
31	Loose flowers - Jasminum sp, Crossandra, Marigold, Rose, Chrysanthemum, Nerium, Torenia	Ha	0.4	All Blocks	56	22.40	56	22.40	56	22.40	56	22.40	56	22.40	280	112.00
32	Cost of planting material & cultivation of Rose, Liliun, under poly house / Shade net house	1000 Sq.m	4.26	B5,B16	1	4.26	1	4.26	0	0.00	0	0.00	1	4.26	3	12.78
VI	Area expansion /Gap filling of Plantation crops															
33	Cocoa	Ha	0.5	B4, B5, B6, B7, B14, B16, B17	80	40.00	80	40.00	80	40.00	80	40.00	80	40.00	400	200.00

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
34	Cashew	Ha	0.5	All Blocks except B2, B8	85	42.50	85	42.50	85	42.50	85	42.50	85	42.50	425	212.50
35	Coconut	Ha	0.5	All Blocks	205	102.50	205	102.50	205	102.50	205	102.50	205	102.50	1025	512.50
36	Bamboo and Other crops	Ha	0.6	All Blocks except B1, B3, B4	17	10.20	17	10.20	2	1.20	2	1.20	17	10.20	55	33.00
VII	Rejuvenation/INM-IPM/Mulching/Anti bird net															
37	Mango/Cashew - Rejuvenation	Ha	0.4	B16, B17	40	16.00	40	16.00	40	16.00	40	16.00	40	16.00	200	80.00
38	INM/IPM for Horticultural crops	Ha	0.04	All Blocks	400	16.00	400	16.00	400	16.00	400	16.00	400	16.00	2000	80.00
39	Mulching	Ha	0.32	All Blocks	41	13.12	41	13.12	41	13.12	41	13.12	41	13.12	205	65.60
40	Anti Bird net	1000 Sq.m	0.35	B5, B6, B7, B8, B10	4	1.40	5	1.75	4	1.40	5	1.75	4	1.40	22	7.70
VIII	Pollination Support through Bee Keeping															
41	Bee hive & Colony	No	0.04	All Blocks	950	38.00	950	38.00	950	38.00	950	38.00	950	38.00	4750	190.00
42	Honey Extractor	No	0.2	All Blocks	95	19.00	95	19.00	95	19.00	95	19.00	95	19.00	475	95.00
IX	Organic Farming															
43	Organic farming and PGS certification in 50 acre cluster	1 cluster	14.95	B3, B5, B6, B13	3	44.85	0	0.00	1	14.95	0	0.00	0	0.00	4	59.80
44	HDPE Vermibed	No	0.16	All Blocks	38	6.08	38	6.08	38	6.08	38	6.08	38	6.08	190	30.40

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
X	Rainfed Area development															
45	Integrated farming system - Horticulture Based farming	Ha	0.5	B8, B9, B10, B19	85	42.50	75	37.50	75	37.50	75	37.50	75	37.50	385	192.50
46	Moisture stress management - Minimum irrigation gurantee by PUSA hydrogel	Ha	0.1	B8, B9, B10, B19	80	8.00	70	7.00	70	7.00	70	7.00	70	7.00	360	36.00
B	Infra structures and Assets creation															
I	Protected cultivation															
1	Poly Green House	1000 Sq.m	9.35	All Blocks except B2	9	84.15	9	84.15	9	84.15	9	84.15	9	84.15	45	420.75
2	Shadenet	1000 Sq.m	7.1	All Blocks	12	85.20	11	78.10	12	85.20	13	92.30	13	92.30	61	433.10
II	Mushroom production															
3	Cottage mushroom unit	1 No.	1	B6	0	0.00	1	1.00	0	0.00	1	1.00	1	1.00	3	3.00
III	Vermicompost unit															
4	Permanent Vermicompost Unit	600 cu.ft	1	All Blocks except B2	18	18.00	18	18.00	18	18.00	18	18.00	18	18.00	90	90.00
IV	Supporting structures for Horticulture crop production															
5	Permanent Pandhal structure	Ha	4	All Blocks	10	40.00	9.5	38.00	10	40.00	9.5	38.00	9.5	38.00	48.5	194.00

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
V	District Horticulture information and training centre															
VI	Community seed bank															
C	Special interventions															
6	Farm deficiency correction	Ha	0.04	All Blocks	1050	42.00	1050	42.00	1050	42.00	1050	42.00	1050	42.00	5250	210.00
7	Promotion of Roof top Garden/ Potager garden Kit	No	0.005	All Blocks	925	4.63	925	4.63	925	4.63	925	4.63	925	4.63	4625	23.13
8	Promotion of Roof top Garden/ Potager garden Kit with shadenet	No	0.0735	All Blocks	27	1.98	27	1.98	27	1.98	27	1.98	27	1.98	135	9.92
9	Banana Bunch Sleeve	Ha	0.25	B2	50	12.50	50	12.50	0	0.00	0	0.00	0	0.00	100	25.00
10	AESA based IPM in fruits and vegetables Pheromone trap	Ha	0.04	B2	500	20.00	500	20.00	0	0.00	0	0.00	0	0.00	1000	40.00
11	AESA Based IPM in fruits and vegetables Yellow sticky trap	Ha	0.04	B2	500	20.00	500	20.00	0	0.00	0	0.00	0	0.00	1000	40.00
12	AESA Based IPM in fruits and vegetables Light trap	Ha	0.08	B2	500	40.00	500	40.00	0	0.00	0	0.00	0	0.00	1000	80.00
D	Post Harvest Management															
13	Pack house (9m X 6m)	1 No	4	All Blocks	19	76.00	19	76.00	19	76.00	19	76.00	19	76.00	95	380.00

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
14	Low cost onion structure 25 mt	1 No	1.75	B1, B5, B7, B16, B17	15	26.25	15	26.25	15	26.25	15	26.25	15	26.25	75	131.25
15	Collection centre	1 No	15	B7	1	15.00	0	0.00	0	0.00	0	0.00	0	0.00	1	15.00
16	Retail outlet	1 No	15	B7	1	15.00	0	0.00	0	0.00	0	0.00	0	0.00	1	15.00
E	Development of Farms, Nurseries and Parks															
17	Developmental activities in new/existing state Horticultural farm, Keelapalur	No	25	B10,B17	2	50.00	2	50.00	2	50.00	2	50.00	2	50.00	10	250.00
F	Mechanization - Machineries, Equipments & Tools															
18	Power tiller/Tractor/Minit ractor	Nos	1	All Blocks	40	40.00	40	40.00	40	40.00	40	40.00	40	40.00	200	200.00
19	Manual Sprayer-Knapsack/Foot operated Sprayer	Nos	0.12	B2	10	1.20	10	1.20	10	1.20	10	1.20	10	1.20	50	6.00
20	Hand operated sprayer with face mask	Nos	0.025	All Blocks except B1	90	2.25	90	2.25	90	2.25	90	2.25	90	2.25	450	11.25
21	Power operated sprayer	Nos	0.05	All Blocks except B2	180	9.00	180	9.00	180	9.00	180	9.00	180	9.00	900	45.00
22	Plastic crates for vegetable & fruits handling	No of sets containing 10crates	0.075	All Blocks	190	14.25	190	14.25	190	14.25	190	14.25	190	14.25	950	71.25
G	Water Irrigation															

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
	Management															
23	Micro Irrigation - Drip	Ha	1.12	All Blocks	875	980.00	875	980.00	895	1002.40	900	1008.00	920	1030.40	4465	5000.80
24	Rain gun	Ha	0.34	All Blocks	73	24.82	50	17.00	51	17.34	53	18.02	49	16.66	276	93.84
25	Sprinkler	No	0.195	All Blocks	173	33.74	113	22.04	121	23.60	121	23.60	121	23.60	649	126.56
26	Water harvesting system for individuals	No	1.5	All Blocks	19	28.50	19	28.50	19	28.50	19	28.50	19	28.50	95	142.50
H	Capacity Building															
27	Training to farmers within the State. 2 days Rs.1000/farmer/day	No	0.02	All Blocks	95	1.90	95	1.90	95	1.90	95	1.90	95	1.90	475	9.50
28	Training to farmers outside the state. 30 farmers/Batch	No	0.105	B3	30	3.15	30	3.15	30	3.15	30	3.15	30	3.15	150	15.75
29	Exposure visit to farmers for 5 days. Rs.1000/farmer/day	No	0.05	All Blocks	380	19.00	380	19.00	380	19.00	380	19.00	380	19.00	1900	95.00
30	Training to farmers at HTC	No	0.0025	All Blocks	190	0.48	190	0.48	190	0.48	190	0.48	190	0.48	950	2.38
31	Exposure visit of farmers outside India	No	4	All Blocks	19	76.00	19	76.00	19	76.00	19	76.00	19	76.00	95	380.00
32	Training to staff outside the state / Batch of 5 members	No	0.04	B1,B3,B4	1	0.04	2	0.08	0	0.00	0	0.00	0	0.00	3	0.12

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
33	Training to staff outside India	No	6	B1, B2, B3, B4, B17	0	0.00	0	0.00	5	30.00	0	0.00	0	0.00	5	30.00
34	HRD for supervisors and entrepreneurs	No	20	B1,B3	0	0.00	6	120.00	6	120.00	6	120.00	6	120.00	24	480.00
35	District level seminar	No	2	All Blocks	1	2.00	3	6.00	0	0.00	0	0.00	19	38.00	23	46.00
36	Computerization & governance	No	1		0	0.00	0	0.00	0	0.00	1	1.00	1	1.00	2	2.00
37	Publicity and Documentation	No	0.5	All Blocks	19	9.50	19	9.50	19	9.50	19	9.50	19	9.50	95	47.50
I	Crop Insurance and Risk Mitigating schemes															
38	Crop Insurance	Ha	0.025	All Blocks	9500	237.50	9500	237.50	9500	237.50	9500	237.50	9500	237.50	47500	1187.50
	Grand total					3751.37		3757.79		3724.45		3693.83		3765.78		18693.24

B1-Alankulam, B2-Ambasamudram, B3-Cheranmahadevi, B4-Kadayam, B5-Kadayanallur, B6-Kalakadu, B7-Keelapavoor, B8-Kuruvikulam B9-Manur, B10-Melaneelithanallur, B11-Naguneri, B12-Palayamkottai, B13-Pappakudi, B14-Radhapuram, B15-Sankarankoil, B16-Shencottai, B17-Tenkasi, B18-Valliyoor, B19-Vasudevanallur

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 through 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 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. Promoting farm mechanization through demonstrations for Alankulam, Ambasamuthram, Cheranmahadevi, Kadayam, Kadayanallur.
- 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 at Alankulam, Ambasamuthram, Cheranmahadevi, Kadayam, Kadayanallur.
- Promotion of ownership to small and marginal farmers for various agricultural machinery and equipments such as Tractors, Power tillers, Rice transplanter, Self-propelled machinery, Tractor/Power tiller drawn equipments (MB Plough(in for Alankulam, Ambasamuthram, Cheranmahadevi), , Harrow, Leveler Blade at Alankulam, Ambasamuthram, Cheranmahadevi , 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 in Alankulam, Ambasamuthram, Cheranmahadevi, Multi crop thresher, Paddy thresher, Brush cutter, Chaff cutter, Drum Seeder) and Plant protection equipments for all blocks.

- Provision of suitable financial assistance to establish farm machinery banks for custom hiring for appropriate locations and crops for all blocks.
- Introduction of renewable energy in the villages which would replace other fuels also attractive for water pumping applications in remote areas. Solar operated photovoltaic water pumping system provides better sustainable alternative option to fulfill irrigation requirement of agriculture. Hence, providing solar pumping system in all blocks.
- Promotion of agro-processing and management machinery at community level through supply of post-harvest machinery such as self-propelled/other driven horticultural machinery (Chain saw/ wheel barrow/ Mango grader/ planter and other suitable self-propelled machineries and equipments in Cheranmahadevi, Kadayam, Kadayanallur), Manual horticultural equipments. post-harvest equipments for grains, oil seeds and Horticultural crops (Boiler, Steamer, Dryer for solar Washing Machine for all blocks. Grinder, Pulveriser, Polisher, Cleaner cum grader, gradient separator, Specific gravity separator for Alankulam, Ambasamuthram, Cheranmahadevi, Kadayam, Kadayanallur,) this would make sure that more value is added to farm outputs locally.
- Promotion of training to AED engineers on post-harvest techniques and bio energy in Kadayam, Kadayanallur.
- Rehabilitation of irrigation network to bring water directly to the root zone of the crop, improve application and conveyance efficiency, thereby reduce the wastage of water due to flood irrigation. On farm development, extension, renovation and modernisation gravity flow pipe line for all blocks.
- Reclamation of problem soils which needs special management for satisfactory crop production. Physical limitations can be managed by irrigation, drainage, mulching, manuring, tillage, and soil conservation measures such as terracing, contouring, and cover crops whichever is appropriate in all blocks.

Expected outcome

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

Budget

Agriculture continues to be the most predominant sector of this district economy, as 70 percent of the population is engaged in agriculture and allied activities for their livelihood. Agricultural Mechanization could provide the stability in agricultural production in a sustainable manner to meet the food requirement of growing population and also to meet the raw material needs of agro based industries, thereby providing employment opportunities to the rural population. The Major component required to implement in this district are capacity building of farmers and end users with the budget of ₹6.20 lakhs, Financial assistance for the procurement of Agricultural Machinery, Post-harvest machinery and equipments in rural areas with the budget of ₹1069.85 lakhs, Establishment of Farm Machinery Banks, Hi-tech productive equipment hub, Promotion of Farm Mechanization in selected villages with the budget of ₹140.00 lakhs and also implementation of minor irrigation, tractor hiring scheme, solar energy, innovative schemes of AED, Pilot mechanization Demonstration, Post-harvest technology and management of machinery with budget of ₹ 493.20 lakhs. Some other interventions such as Bio- mass gasifier, Construction of Agricultural Engineering Extension centres (AEECs) with the budget of ₹ 2865.03 lakhs are required to implement in this district to enhance the Agricultural Productivity. The overall budget requirement for implementation of above interventions is ₹**5999.28** lakhs.

Implementing agency

The projects will be implemented by the Department of Agricultural Engineering

Table.4.19. Budget requirement for Agricultural Engineering

(₹. in lakhs)

Sl. No.	Interventions	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
Capacity Building																
1	Demonstration of Agricultural Machinery	B1, B2, B3, B4, B5	No's/Ha	0.04	20	0.80	20	0.80	20	0.80	20	0.80	20	0.80	100	4.00
2	Training of farmers	B1, B2, B3, B4, B5	No's/Ha	0.04	3	0.12	3	0.12	3	0.12	3	0.12	3	0.12	15	0.60
3	Training of Rural Youth in workshops	B1, B2, B3, B4, B5	No's/Ha		2	0.08	2	0.08	2	0.08	2	0.08	2	0.08	10	0.40
4	Demonstration of Post Harvest Technologies	B1, B2, B3, B4, B5	No's/Ha	0.04	6	0.24	6	0.24	6	0.24	6	0.24	6	0.24	30	1.20
5	Tractor (8-15 PTO HP)	All Blocks	No's/Ha	3	5	15.00	5	15.00	5	15.00	5	15.00	5	15.00	25	75.00
6	Tractor (15-20 PTO HP)	All Blocks	No's/Ha	4	6	24.00	6	24.00	6	24.00	6	24.00	8	32.00	32	128.00
7	Tractor (Above 20-40 PTO HP)	All Blocks	No's/Ha	6	4	24.00	4	24.00	4	24.00	4	24.00	4	24.00	20	120.00
8	Tractor (40-70 PTO HP)	All Blocks	No's/Ha	8.5	3	25.50	4	34.00	4	34.00	3	25.50	4	34.00	18	153.00
9 Power Tillers																
10	Power Tiller (below 8 BHP)	All Blocks	No's/Ha	1	2	2.00	1	1.00	1	1.00	2	2.00	2	2.00	8	8.00
11	Power Tiller (8 BHP & above)	All Blocks	No's/Ha	1.75	30	52.50	30	52.50	30	52.50	30	52.50	30	52.50	150	262.50
12	Rice Transplanter															
13	Self Propelled Rice Transplanter (4 rows)	All Blocks	No's/Ha	2.5	2	5.00	2	5.00	2	5.00	2	5.00	2	5.00	10	25.00

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
14	Self Propelled Rice Transplanter (Above 4-8 rows)	All Blocks	No's/Ha	16	2	32.00	2	32.00	2	32.00	2	32.00	2	32.00	10	160.00
15	Specialized Self Propelled Machinery															
16	Post Hole Digger / Augur	All Blocks	No's/Ha	0.63	3	1.89	3	1.89	3	1.89	3	1.89	3	1.89	15	9.45
17	Tractor/Power Tiller (below 20 BHP) driven equipments															
18	Land Development, tillage and seed bed preparation equipments															
19	Rotavator	All Blocks	No's/Ha	0.35	10	3.50	10	3.50	10	3.50	10	3.50	15	5.25	55	19.25
20	Intercultivation Equipments															
21	Power Weeder (engine operated below 2 BHP)	All Blocks	No's/Ha	0.25	6	1.50	6	1.50	6	1.50	6	1.50	6	1.50	30	7.50
22	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	2	0.50	2	0.50	2	0.50	2	0.50	4	1.00	12	3.00
23	Tractor (above 20-35 BHP) driven 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
24	Land Development, tillage and seed bed preparation equipments															
25	Disc Plow	B1, B2, B3, B4, B5	No's/Ha	0.4	0	0.00	0	0.00	1	0.40	1	0.40	1	0.40	3	1.20
26	Cultivator	B1, B2, B3, B4, B5	No's/Ha	0.25	0	0.00	0	0.00	1	0.25	1	0.25	1	0.25	3	0.75
27	Harvesting & Threshing Equipments															
28	Brush Cutter	All Blocks	No's/Ha	0.3	4	1.20	4	1.20	4	1.20	4	1.20	4	1.20	20	6.00
29	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	0.4	0	0.00	0	0.00	1	0.40	1	0.40	0	0.00	2	0.80
30	Tractor (above 35 BHP) driven equipments															
31	a.Land Development, tillage and seed bed preparation equipments															
32	MB Plow	B1, B2, B3	No's/Ha	1	1	1.00	1	1.00	1	1.00	1	1.00	2	2.00	6	6.00
33	Disc Plow	All Blocks	No's/Ha	0.6	3	1.80	3	1.80	3	1.80	3	1.80	3	1.80	15	9.00
34	Cultivator	All Blocks	No's/Ha	0.3	4	1.20	3	0.90	3	0.90	3	0.90	3	0.90	16	4.80

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
35	Leveler Blade	B1, B2, B3	No's/Ha	0.3	0	0.00	0	0.00	0	0.00	0	0.00	3	0.90	3	0.90
36	Rotavator	All Blocks	No's/Ha	0.95	10	9.50	10	9.50	10	9.50	10	9.50	20	19.00	60	57.00
37	Sowing Planting, Reaping and Digging Equipments:															
38	Zero till seed cum fertilizer drill	B1, B2, B3	No's/Ha	0.7	0	0.00	0	0.00	3	2.10	0	0.00	0	0.00	3	2.10
39	Equipments for Residue management/Hay and Forage Equipments															
40	Coconut Frond chopper	B1, B2, B3	No's/Ha	1.05	0	0.00	0	0.00	0	0.00	3	3.15	0	0.00	3	3.15
41	All Manual/animal drawn equipment/impl ements / Tools															
42	Drum Seeder (Above 4 Row)	All Blocks	No's/Ha	0.15	0	0.00	0	0.00	0	0.00	5	0.75	5	0.75	10	1.50
43	Plant protection equipments															
44	Manual sprayer: Knapsack/foot operated sprayer	All Blocks	No's/Ha	0.015	5	0.08	5	0.08	5	0.08	10	0.15	5	0.08	30	0.45
45	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity 8-12 lts)	All Blocks	No's/Ha	0.06	5	0.30	10	0.60	10	0.60	10	0.60	10	0.60	45	2.70

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
46	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity above 12-16 lts)	All Blocks	No's/Ha	0.08	5	0.40	10	0.80	10	0.80	5	0.40	5	0.40	35	2.80
47	Establishment of Farm Machinery Banks for Custom Hiring	All Blocks	No's/Ha	28	1	28.00	1	28.00	1	28.00	1	28.00	1	28.00	5	140.00
48	Solar Energy															
49	5 hp	All Blocks	No's/Ha	3.75	10	37.50	10	37.50	10	37.50	10	37.50	10	37.50	50	187.50
50	upto 400sq.ft	B1, B2, B3, B4, B5	No's/Ha	4.25	1	4.25	1	4.25	1	4.25	1	4.25	1	4.25	5	21.25
51	Information Technology (IT) related items															
52	Modernisation of Tractor workshops of AED	B1, B2, B3, B4, B5	No's/Ha	50	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
53	Chain saw/ Wheel barrow/ Mango grader/ planter and other suitable self propelled machineries and equipments for horticulture Crops	B3, B4, B5	No's/Ha	1	3	3.00	0	0.00	0	0.00	0	0.00	0	0.00	3	3.00
54	Post-Harvest Equipments for food grains, oil															

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
	seeds and Horticultural Equipments															
55	All types of Boiler/ Steamer/ Dryer solar (for all type of Horticulture / Food grain / Oil seeds crop)	B1, B2, B3, B4, B5	No's/Ha	2	0	0.00	0	0.00	5	10.00	0	0.00	0	0.00	5	10.00
56	All types of Washing Machines (for all type of Horticulture / Food grain / Oil seed crop)	All Blocks	No's/Ha	1.5	0	0.00	5	7.50	5	7.50	0	0.00	0	0.00	10	15.00
57	All types of Grinder/ Pulveriser/ Polisher (for all type of Horticulture / Food grain / Oil seed crop)	B1, B2, B3, B4, B5	No's/Ha	0.3	0	0.00	5	1.50	4	1.20	0	0.00	0	0.00	9	2.70
58	All types of Cleaner cum grader/ Gradient separator/ Specific gravity separator (for all types of Horticulture / Food grain / Oil seed crop)	B1, B2, B3, B4, B5	No's/Ha	0.75	0	0.00	5	3.75	0	0.00	0	0.00	0	0.00	5	3.75

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
59	Construction of Agricultural Engineering Extension centres (AEECs)	All Blocks	No's/Ha	75	0	0.00	4	300.00	5	375.00	5	375.00	5	375.00	19	1425.00
60	Training of AED Engineers on " Agricultural Processing" and " Bio-Energy"	B4, B5	No's/Ha	0.04	0	0.00	1	0.04	1	0.04	0	0.00	0	0.00	2	0.08
61	Rehabilitation of Irrigation Network in Chittar Sub Basin under NABARD assistance															
62	On Farm Development works	All Blocks	No's/Ha	0.35	250	87.50	500	175.00	587	205.45	0	0.00	0	0.00	1337	467.95
63	Extension, Renovation and Modernisation of Field Channels	All Blocks	No's/Ha	0.15	800	120.00	1600	240.00	1600	240.00	0	0.00	0	0.00	4000	600.00
64	Gravity flow Pipeline System	All Blocks	No's/Ha	0.5	0	0.00	250	125.00	250	125.00	0	0.00	0	0.00	500	250.00
65	Construction of farm pond	All Blocks	No's/Ha	1	20	20.00	40	40.00	40	40.00	0	0.00	0	0.00	100	100.00
66	Construction of Water Harvesting Structures															
67	I. Check dams	All Blocks	No's/Ha	5	25	125.00	20	100.00	15	75.00	0	0.00	0	0.00	60	300.00

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
68	II.Percolation Pond	B1, B2, B3, B4, B5	No's/Ha	15	0	0.00	2	30.00	3	45.00	0	0.00	0	0.00	5	75.00
69	III. Recharge shafts	All Blocks	No's/Ha	0.6	15	9.00	45	27.00	10	6.00	0	0.00	0	0.00	70	42.00
70	Micro Irrigation System	All Blocks	No's/Ha	0.8	45	36.00	50	40.00	50	40.00	0	0.00	0	0.00	145	116.00
71	Provision of solar pumping system	All Blocks	No's/Ha	5	10	50.00	25	125.00	25	125.00	0	0.00	0	0.00	60	300.00
72	Promotion of fodder bank for cattles	All Blocks	No's/Ha	0.1	60	6.00	40	4.00	40	4.00	0	0.00	0	0.00	140	14.00
73	Prevention of sea water intrusion															
74	Reclamation of Problem(Alkaline & Saline) soils	All Blocks	No's/Ha	0.6	350	210.00	200	120.00	100	60.00	150	90.00	200	120.00	1000	600.00
	Grand total					990.36		1670.55		1694.10		793.88		850.41		5999.28

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

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.

Components

Promotion of commodity groups and market information

- Construction of storage godown in Tenkasi.
- Construction of drying yards in all blocks except Ambasamuthram, Cheranmahadevi, Pappakudi, Kadayam, Nanguneri, Kalakadu, Radhapuram and Vasudevanallur.
- Upgradation of uzhar shandies at Palayamkottai
- Strengthening of Regulated Markets through providing computer and other accessories to Palayamkottai, Sankarankovil, Ambasamudram, Valliyoor, Radhapuram, Keelapavoor, Kadayanallur and Tenkasi.
- Formation of Farmer Producer Organizations (FPO) in Palayamkottai, Pappakudi and Tenkasi.
- Supply chain and post-harvest management for banana, onion in Palayamkottai, Sankarankovil, Valliyoor, Keelapavoor and Kadayanallur. , Kadayanallur, Nanguneri, Sankarankovil, and Sankarankovil.
- Distribution of taurpaulins in Vasudevanallur,

- RURBAN in Manur.
- Market intelligence/market advisory generation and dissemination
- Exposure visit (within state & outside state) for commodity group farmers to acquire value addition technologies for all blocks except Kurivikulam, Ambasamuthiram, Cheranmahadevi.
- Provide training on market led extension in all blocks.

Budget

The district plan proposes an outlay of **Rs. 3536.59** lakhs over a period of five years for Tirunelveli 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 4.20 Budget for Agricultural Marketing in Tirunelveli district

(₹ in lakhs)

Sl. No.	Intervention	Unit (Nos.)	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
Promotion of Commodity Groups and Market Information																
1	e-learning Centre	Nos.	60	B1		0.00		0.00	1	60.00		0.00		0.00	1	60.00
2	Provision of agmark lab equipments	Nos.	5	B1, B18	2	10.00	1	5.00	1	5.00	1	5.00	1	5.00	6	30.00
Strengthening of Uzhavar Sandhai and Regulated Market																
3	Computers and other accessories	Nos.	1	B1, B7, B14, B18	4	4.00	0	0.00	0	0.00	0	0.00	0	0.00	4	4.00
4	Drying Yard	Nos.	6	All Blocks except B2, B6, B7, B8, B9, B10, B11, B13, B19	10	60.00	7	42.00	7	42.00	7	42.00	8	48.00	39	234.00
5	Storage godown	Nos.	20	B18	1	20.00	1	20.00	0	0.00	0	0.00	0	0.00	2	40.00
6	Strengthening of RM	Nos.	105.68	B1, B5, B6, B12, B13, B15, B16, B18	8	845.44	0	0.00	0	0.00	0	0.00	0	0.00	8	845.44
7	Upgradation of Uzhavar Shadhais	Nos.	22.1	B1	2	44.20		0.00		0.00		0.00		0.00	2	44.20
Formation of FPO / Strengthening of Existing Commodity Groups																
6	FPO	Nos.	43.21	B1, B8, B18	4	44.41	0	80.64	0	75.00	0	0.00	0	0.00	4	200.05
Provision of Market Access and Market Activities																

Sl. No.	Intervention	Unit (Nos.)	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	RURBAN	Nos.		B2		27.40		32.90								60.30
8	Special Area Development Programme	Nos.		All Blocks except B1, B2, B3, B4, B7, B8, B9		7.60	0	0.00	0	0.00	0	0.00	0	0.00	0	7.60
9	Tarpaulin	Nos.	0.08	B19	380	30.40	380	30.40	380	30.40	380	30.40	380	30.40	1900	152.00
Post- Harvest Infrastructure and Machinaries																
10	SCM-PPC for Banana and Onion, Creating infrastructure, Ripening Chamber, Weigh Bridge, Grading and Packing hall, Onion Grading machine and other accessories	Nos.		B1, B5, B12, B15, B16	5	1000.00	0	683.20	0	0.00	0	0.00	0	0.00	5	1683.20
Capacity building Programme																
11	Exposure Visits - within state	Nos.	0.4	All Blocks except B4, B6, B7	16	6.40	16	6.40	16	6.40	16	6.40	16	6.40	80	32.00
12	Exposure Visits - outside state - 3 days	Nos.	1	All Blocks except B4, B6, B7	16	16.00	16	16.00	16	16.00	16	16.00	16	16.00	80	80.00
13	Training on Market led Extension, Agmark grading&Food safety, post	Nos.	0.2	All Blocks	64	12.80	64	12.80	63	12.60	64	12.80	64	12.80	319	63.80

Sl. No.	Intervention	Unit (Nos.)	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
	harvest technology, Supply Chain Management, Grading-sorting-packing, Market linkages & Exports, Food processing and value addition at district level															
	Grand total					2128.65		929.34		247.40		112.60		118.60		3536.59

B1-Palayamkottai, B2-Manur, B3-Melaneelithanallur, B4-Kuruvikulam, B5-Sankarankoil, B6-Ambasamudram, B7-Cheranmahadevi, B8-Pappakudi, B9-Kadayam, B10-Nanguneri, B11-Kalakadu, B12-Valliyoor, B13-Radhapuram, B14-Alankulam, B15-Keelapavoor, B16-Kadayannallur, B17-Shencottai, B18-Tenkasi, B19-Vasudevanallur

4.5 Seed and Organic Certification

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

Project components

1. Strengthening communication and networking facilities for all blocks through providing computer accessories.
2. Strengthening of lab facilities by providing AC, conductivity meter, dehuller, dehumidifier, digital moisture meter, RO system, fabricated display racks to all blocks.
3. Capacity building by providing training to seed producers for quality seed production in all blocks.

Expected outcome

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

Budget

The budget requirement for fulfilling those interventions is ₹ **40.72** Lakhs.

Implementing agency

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

Table 4.21. Budget requirement for Seed certification in Tirunelveli district

(₹ in lakhs)

Sl. No.	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total		
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	
I	Strengthening of Seed Certification lab																
1	Blower, Conductivity meter, Dehuller/Scarifier, Dehumidifier Air Conditioner, Digital moisture meter, Dunnage, Fabricated display Racks ,Geaser, Generator, Heater, Hot air oven, Humidifier, Incubator, Induction stove, Microscope, Moisture meter, Packing machine, R. O system, Sample racks,Seed Grinder, Sieve, Thermohydro meter, Dunnage,Trolley for carriages, Working chair, Working table, Miscellaneous,	All Blocks	No's	13.36	1.00	13.36	1.00	13.36	0.00	0.00	0.00	0.00	0.00	0.00	2.00	26.72	
II	Strengthening of communication and networking facilities																
1	Computer accessories	All Blocks	No's	0.50	20.00	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	20.00	10.00	
III	Capacity Building																
1	Training to seed grower for quality seed production	All Blocks	No's	0.20	0.00	0.00	4.00	0.80	4.00	0.80	4.00	0.80	4.00	0.80	16.00	3.20	
2	Training to seed producers on seed certification procedures	All Blocks	No's	0.10	0.10	0.00	0.00	2.00	0.20	2.00	0.20	2.00	0.20	2.00	0.20	8.00	
	Total					23.36		14.36		1.00		1.00		1.00		40.72	

4.6 Animal Husbandry sector

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

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

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

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

Increasing the availability of fodder through field level interventions

Livestock rearing is one of the major occupations in India and is making significant contribution to the country's GDP. The livestock population, over the years, has shown a steady growth on broadly two counts i.e. (i) increase in the number of stall feeding based bovine livestock viz. buffaloes and hybrid cattle breeds, 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 the 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. It is noted that 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 situation. To overcome these issues the following field level interventions are proposed to improve the fodder availability.

1. Establishment of vermicomposting unit in all blocks.
2. Distribution of Azolla trays for Manur.
3. Fodder plot development in all blocks.
4. Meikal land development in all blocks.
5. Distribution of sprinklers, silage bags for conservation of fodder crops in all blocks.
6. Development of seed production plots in all blocks.

Increasing the availability of fodder by strengthening farm infrastructure

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

providing proper infrastructure and equipment to the veterinary health care institution is necessary for the timely diagnosis and treatment of animal diseases. Further, emphasis has to be laid on optimum utilization of waste land to grow fodder.

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

1. Establishment of farm production cover at Manur.
2. Construction of silo pit and overhead tanks at Manur.
3. Establishment of feed mixing units at Manur.
4. Installation of rain gun and sprinklers at Manur.
5. Procurement of agricultural inputs and implements at Manur.
6. Provide drip irrigation for Manur.

Livestock breeding management

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

The 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 needs to be modified.

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. The replacement of unproductive and ageing animals in the herd and its expansion are very important to

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

1. CIDR for all blocks.
2. Establishment of LN2 at Manur.
3. Induction of new genetic pool in Manur.

Livestock health

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

1. Procurement of vaccines, medicine, diagnostic kit for all blocks.
2. Establishment of animal quarantine facility in govt. farm at Manur.

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 interventions proposed are

1. Distribution of sheep, goat and buffalo in all blocks.
2. Establishment of modern poultry, hatchery complex, piggery, sheep, goat and bull shed at Manur.

3. Encouraging integrated farming in all blocks.
4. Development of native chicken farms in all blocks.
5. Provide milking machine to Manur.

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 among farmers regarding various livestock management issues would be promoted. For companion animals, state governments may consider to extend the veterinary services on full cost recovery basis. To improve the service delivery the following interventions have been proposed.

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

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 intervention have been proposed are

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

Capacity building

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

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

1. Establishment of farmers training Centre at Alankulam.
2. Conducting demonstrations camps and campaigns in all blocks.
3. Creating awareness of livestock management to the farmers through training programmes for all blocks.
4. Update of scientific advancement and technical skill of veterinarian for all blocks.

Budget allocation

The major themes proposed in the plan for animal husbandry sector with a total budget out lay of ₹. **10222.95** lakhs.

Project implementing agency

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

Table 4.22. Budget requirement for Animal Husbandry sector in Tirunelveli district

(₹ 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	27	1.35	27	1.35	27	1.35	27	1.35	27	1.35	135	6.75
2	Distribution of Azolla trays	Nos	0.03049	B9	380	11.59	382	11.65	380	11.59	380	11.59	380	11.59	1902	58.00
3	Distribution of Silage bags for conservation of fodder crops	Nos	0.005	All Blocks	670	3.35	670	3.35	670	3.35	670	3.35	670	3.35	3350	16.75
4	Fodder plot development	acre	0.05	All blocks	400	20.00	400	20.00	400	20.00	200	10.00	200	10.00	1600	80.00
5	Meikal land development (incl infrastructure development)	acre	6	All Blocks	17	102.00	3	18.00	5	30.00	4	24.00	4	24.00	33	198.00
6	Developemnt of Seed Production plots	acre	0.25	All Blocks	19	4.75	19	4.75	19	4.75	19	4.75	19	4.75	95	23.75
7	Distribution of sprinkler for fodder production	Nos	0.25	All Blocks	59	14.75	59	14.75	59	14.75	59	14.75	59	14.75	295	73.75
	Increasing the Availability of Fodder by Strengthening Farm Infrastructure															

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
9	Establishment of Vermicompost unit (10 beds) at Farms	Nos	4	B9	5	20.00	5	20.00	5	20.00	5	20.00	5	20.00	25	100.00
10	Erection of Transformers to improve irrigation facility in Govt.farm	Nos	30	B9	0	0.00	1	30.00	0	0.00	0	0.00	0	0.00	1	30.00
11	Establishment of Farm Protection Cover (Bio-security wall)	km	5	B9	0	0.00	20	100.00	0	0.00	0	0.00	0	0.00	20	100.00
12	Establishment of Feed mixing/ feed block units	Nos	25	B9	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	1	25.00
13	Construction of silo Pit for livestock farm	Nos	1	B9	5	5.00	4	4.00	4	4.00	4	4.00	4	4.00	21	21.00
14	Construction of Over Head Tanks/ GLR / Pre-fabricated tanks in farm	Nos	20	B9	0	0.00	2	40.00	0	0.00	0	0.00	0	0.00	2	40.00
15	Drip irrigation for livestock farms	acre	0.6	B9	50	30.00	50	30.00	50	30.00	50	30.00	50	30.00	250	150.00
16	Borewell for livestock farms	Nos	8	B9	2	16.00	2	16.00	2	16.00	2	16.00	2	16.00	10	80.00
17	Installation of Raingun in Govt.farm in cultivated areas	acre	0.4	B9	20	8.00	20	8.00	20	8.00	20	8.00	20	8.00	100	40.00
18	Installation of Sprinkler system in fodder cultivated areas in Govt.farm	acre	0.4	B9	10	4.00	10	4.00	10	4.00	10	4.00	10	4.00	50	20.00

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
19	Procurement of Agri inputs for Farms	acre	0.15	B9	80	12.00	80	12.00	80	12.00	80	12.00	80	12.00	400	60.00
20	Procurement of Agricultural implements (tractor, trailers, harvesters, ploughs, chaff cutter, grass cutter etc)	Pack	50	B9	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
	Livestock Breeding Management															
21	CIDR (Controlled Internal Drug Release) for increasing Fertility in Cattle	Nos	0.01	All Blocks	1000	10.00	1000	10.00	1000	10.00	1000	10.00	1000	10.00	5000	50.00
22	Induction of new Genetic Pool	Nos	0.5	B9	50	25.00	50	25.00	50	25.00	50	25.00	50	25.00	250	125.00
23	Establishment of Liquid Nitrogen Plant	No	500	B9	0	0.00	1	500.00	0	0.00	0	0.00	0	0.00	1	500.00
	Livestock Health															
24	Procurement of vaccines, medicines, diagnostic kits, reagents etc	Nos	1000	All Blocks	0.38	380.00	0.38	380.00	0.38	380.00	0.38	380.00	0.38	380.00	1.9	1900.00
25	Animal Quarantine Facility in Govt.farm to prevent disease outbreak	Nos	50	B9	1	50.00	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Improving the Livestock Productivity															
26	Distribution of Sheep/Goat units -semi intensive system	Nos	0.6	All Blocks	27	16.20	23	13.80	26	15.60	25	15.00	26	15.60	127	76.20
27	Distribution of Buffalo units(5 Buffaloes)	Nos	4.5	All Blocks	21	94.50	20	90.00	18	81.00	17	76.50	20	90.00	96	432.00
28	Integrated farming (Goat+Cattle+Fish+Agriculture /Horticulture)	Unit	2	All Blocks	5	10.00	5	10.00	5	10.00	5	10.00	5	10.00	25	50.00
29	Development of Native chicken farms	Farm	1	All Blocks	25	25.00	25	25.00	25	25.00	25	25.00	25	25.00	125	125.00
30	Establishment of disposal pits for poultry unit	Nos	1	All Blocks	25	25.00	25	25.00	25	25.00	25	25.00	25	25.00	125	125.00
31	Milking Mechine	Nos	0.5	B9	10	5.00	0	0.00	20	10.00	0	0.00	20	10.00	50	25.00
32	Distribution of Piggery units (fattening-5 Nos)	Nos	1.25	All Blocks except B2, B4, B6, B5, B15, B16	9	11.25	4	5.00	10	12.50	2	2.50	7	8.75	32	40.00
33	Establishment of Modern Poultry Shed	Nos	25	B9	1	25.00	1	25.00	1	25.00	1	25.00	1	25.00	5	125.00
34	Establishment of Modern Hatchery Complex	Nos	300	B9	0	0.00	0	0.00	1	300.00	0	0.00	0	0.00	1	300.00
35	Establishment of Modern Dairy/ Bull Shed	Nos	150	B9	1	150.00	0	0.00	1	150.00	0	0.00	1	150.00	3	450.00

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
36	Establishment of Modern Piggery Shed	Nos	150	B9	1	150.00	0	0.00	1	150.00	0	0.00	1	150.00	3	450.00
37	Establishment of Modern Sheep/Goat Shed	Nos	50	B9	1	50.00	0	0.00	1	50.00	0	0.00	2	100.00	4	200.00
	Improving the Service Delivery at Veterinary Institutions															
38	Deep freezer facility for Storage of vaccines and Medicines	Nos	10	All Blocks	0	0.00	0	0.00	19	190.00	0	0.00	0	0.00	19	190.00
39	Establishment of Infrastructure facilities for Veterinary Institutions	Nos	30	All Blocks	19	570.00	0	0.00	19	570.00	0	0.00	19	570.00	57	1710.00
40	Establishment of Mobile Disease Diagnostic Labs	No	20	B17	1	20.00	0	0.00	0	0.00	0	0.00	0	0.00	1	20.00
41	Establishment of Mobile Veterinary Units	Nos	10	All Blocks	12	120.00	4	40.00	3	30.00	0	0.00	0	0.00	19	190.00
42	Establishment of surgical theatres at veterinary institution	Nos	30	All Blocks	4	120.00	4	120.00	4	120.00	4	120.00	3	90.00	19	570.00
43	Providing solar lighting panels at veterinary institution	Nos	1	All Blocks	19	19.00	8	8.00	19	19.00	8	8.00	19	19.00	73	73.00
44	Package of Modern Veterinary	Nos	30	All Blocks	4	120.00	4	120.00	4	120.00	4	120.00	3	90.00	19	570.00

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
	Diagnostic Aids to Veterinary Institutions such as Computerised X rays, Ultrasound, Diathermy etc.															
45	Establishment of Ambulance facility for animals	Nos	80	B1	1	80.00	1	80.00	0	0.00	0	0.00	0	0.00	2	160.00
	Livestock Management															
46	Animal Identification and Traceability	Unit of 1000 animals	0.1	All Blocks	300	30.00	30	3.00	30	3.00	30	3.00	30	3.00	420	42.00
47	Conservation of Indigenous breeds	Pack	10	All Blocks	1	10.00	1	10.00	1	10.00	1	10.00	1	10.00	5	50.00
	Capacity Building															
48	Establishment of Farmers training Centre	Nos	200	B1	0	0.00	1	200.00	0	0.00	0	0.00	0	0.00	1	200.00
49	Conducting Demonstrations, Camps and Campaigns	Nos	0.1	All Blocks	47	4.70	47	4.70	47	4.70	47	4.70	47	4.70	235	23.50
50	Creating awareness of livestock management to the farmers through Training Programmes	Nos	0.1	All Blocks	47	4.70	47	4.70	47	4.70	47	4.70	47	4.70	235	23.50

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
51	Update of scientific advancement and technical skill of Veterinarians (Workshop, Hands-on trainings)	Nos	0.05	All Blocks	19	0.95	19	0.95	19	0.95	19	0.95	19	0.95	95	4.75
	Grand total					2429.09		2113.00		2571.24		1079.14		2030.49		10222.95

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.6.1. Animal Science Research

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

Project components

- Referral Water testing laboratories for all blocks.
- Animal feed and fodder technology park for all blocks.
- Centralized molecular laboratories for all blocks.
- Modernization of dairy operations for all blocks.
- Fodder bank for fodderseed/slips in all blocks.

Budget

It is proposed to incur ₹.3814.10 lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

The project will improve the research on animals and produce good quality breeds in animals and increase income of the farmers of Tamil Nadu.

Implementing Agency

Tamilnadu Animal Sciences and Veterinary University will implement the project

Table 4.23. Budget requirement for Animal Husbandry Research in Tirunelveli district

(Rs. 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	Infrastructure and Assets															
1	Centralized Molecular laboratories	All Blocks	Nos	508	1	508.00	1	508.00	0	0.00	0	0.00	0	0.00	2	1016.00
2	Animal Feed and Fodder Technology Parks	All Blocks	Nos	150	0	0.00	1	150.00	1	150.00	0	0.00	0	0.00	2	300.00
3	Referral Water Testing Laboratories	All Blocks	Nos	216.4	1	216.40	1	216.40	1	216.40	1	216.40	0	0.00	4	865.60
4	Modernization of dairy operations	All Blocks	No	116.5	1	116.50	1	116.50	1	116.50	1	116.50	1	116.50	5	582.50
5	Fodder bank for seed/slips	All Blocks	Nos	150	2	300.00	2	300.00	1	150.00	1	150.00	1	150.00	7	1050.00
	Grand total					1140.90		1290.90		632.90		482.90		266.50		3814.10

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.7. Dairy Development

The importance of dairying in a country like India hardly needs emphasize. India has vast resources of livestock, which play an important role in the national economy and also in the socioeconomic development of millions of rural households. India has one of the largest stocks of cattle and buffaloes: more than 50 percent of the world's buffaloes and 20 percent of its cattle.

Dairy sector acts as an important source of income for rural families, plays a vital role in providing gainful employment and income generating opportunities in the district. During the last 10 years, the annual growth rate of 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 proposed are,

1. Milk storage tanks of various capacities for all blocks.
2. Milk tankers for all blocks.
3. Milk pumps for all blocks.
4. Curd processing equipment for all blocks.
5. Pasteurizers for all blocks.
6. Heaters and chillers for all blocks.
7. Washer and conveyors for all blocks.
8. Pipes and fittings for all blocks.

9. Cleaning equipment for all blocks.
10. Electrical installations (UPS, generators, stabilizers, control panel) for all blocks.
11. Packing machineries for milk, butter, ghee, SMP and other milk products for all blocks.

Enhancing milk production and milk processing units

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

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

1. Provision of veterinary medicine for all blocks.
2. Electronic milk testing equipment's for all blocks.
3. Equipments for artificial insemination for all blocks.
4. Milk society buildings and cow shed for all blocks.
5. Cryogenic containers for all blocks.
6. Weighing machines for all blocks.
7. Computer accessories for all blocks.
8. Two wheeler for AI technicians for all blocks.

Capacity building

India is the largest milk producer in the world with an annual production of over 155.4 metric tonnes of milk, yet the sector faces numerous issues. One of the major challenges facing the dairy sector is the growing gap between milk supply and demand. Another major challenge arises from the fact that more than 92 percent of the animals are owned by smallholders who had little ownership of land to manage them. The small farmers do not have sufficient resources and lack training in dairy sector that leads to poor animal health and low milk yield. Furthermore, the small farmers lack knowledge of modern breeding practices. The following interventions have been proposed.

1. Training of personnel of MPCS, Union and federation for all blocks.
2. Infertility campaign for all blocks.

Marketing structures

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

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

Processing and value addition

Adding value to farm and livestock products before they reach the local and international market is one of the key aims of Vision 2030. Value addition in the dairy value chain is still a challenge in our country. Value addition has been hailed as one of the solutions to the perishability challenge of milk by converting it to a more durable form and hence reducing farm losses. But only few of them undertake the value addition In India. To maximize the value addition in rural areas the following interventions have been suggested

1. Refrigeration plant for all blocks.
2. Dairy processing plants for all blocks.
3. Water and effluent treatment plants for all blocks.
4. Steam raising plant for all blocks.
5. Fat handling and other dairy equipments for all blocks.

Development for dairy sector

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

1. Construction of BMC building for all blocks.

Budget allocation

An outlay of **Rs.12555** 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.

Implementing agency

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

Table 4.24. Budget requirement for Dairy development in Tirunelveli district

(₹ 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
Strengthening of milk storage and processing units																
1	Electrical installation like Transformer, UPS, Stabilizers, Control Panel MCC etc.,	All blocks	No.	25.00	1	25.00	1	25.00	1	25.00	1	25.00	1	25.00	5	125.00
2	Milk Storage Tanks of various capacities	All blocks	No.	15.00	2	30.00	2	30.00	2	30.00	2	30.00	1	15.00	9	135.00
3	Tub washer, Can washers, Crate conveyor systems.	All blocks	No.	10.00	2	20.00	2	20.00	2	20.00	2	20.00	2	20.00	10	100.00
4	Point of Sale Machines and billing systems	All blocks	No.	0.25	30	8.00	30	8.00	30	8.00	30	8.00	30	8.00	150	38.00
5	SS pipes and fittings	All blocks	No.	5.00	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	No.	2.00	4	8.00	4	8.00	4	8.00	4	8.00	4	8.00	20	40.00
7	Packing Machineries for milk, Butter, Ghee, SMP and Other Milk products	All blocks	No.	18.00	2	36.00	2	36.00	2	36.00	2	36.00	2	36.00	10	180.00
8	Plate Heat type Chillers and pasteurizers	All blocks	No.	10.00	2	20.00	2	20.00	2	20.00	2	20.00	2	20.00	10	100.00
9	Milk Tankers of various capacities	All blocks	No.	25.00	2	50.00	2	50.00	2	50.00	2	50.00	2	50.00	10	250.00
10	Milk Pumps of Various capacities	All blocks	No.	0.50	8	4.00	8	4.00	8	4.00	8	4.00	8	4.00	40	20.00
11	Generator of various capacities	All blocks	No.	20.00	1	20.00	1	20.00	1	20.00	1	20.00	1	20.00	5	100.00
12	Curd processing equipments	All blocks	No.	50.00	1	50.00	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00
13	Cleaning In Place equipments with	All blocks	No.	75.00	0	0.00	1	75.00	0	0.00	0	0.00	0	0.00	1	75.00

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
	accessories															
Enhancing milk productions and milk processing units																
14	Veterinary Medicine	All blocks	No.	2.00	5	10.00	5	10.00	5	10.00	5	10.00	5	10.00	25	50.00
15	Two wheeler for AI technician	All blocks	No.	0.50	30	15.00	30	15.00	30	15.00	30	15.00	30	15.00	150	75.00
16	Computer system with accessories	All blocks	No.	0.50	30	15.00	30	15.00	30	15.00	30	15.00	30	15.00	150	75.00
17	Fodder seed materials	All blocks	No.	0.25	30	8.00	30	8.00	30	8.00	30	8.00	30	8.00	150	38.00
18	Fodder development equipments like chaff cutter, Mower etc.,	All blocks	No.	0.20	30	6.00	30	6.00	30	6.00	30	6.00	30	6.00	150	30.00
19	Bulk Milk coolers of Various capacities	All blocks	No.	15.00	5	75.00	5	75.00	5	75.00	5	75.00	5	75.00	25	375.00
20	Milk cans	All blocks	No.	0.04	800	28.00	800	28.00	800	28.00	800	28.00	800	28.00	4000	140.00
21	Electronic weighing scales of various capacities.	All blocks	No.	0.30	30	9.00	30	9.00	30	9.00	30	9.00	30	9.00	150	45.00
22	Electronic milk testing equipments	All blocks	No.	1.25	30	38.00	30	38.00	30	38.00	30	38.00	30	38.00	150	188.00
23	Milking machine	All blocks	No.	0.80	30	24.00	30	24.00	30	24.00	30	24.00	30	24.00	150	120.00
24	Cow shed	All blocks	No.	5.00	10	50.00	10	50.00	10	50.00	10	50.00	10	50.00	50	250.00
25	Society Buildings	All blocks	No.	20.00	10	200.00	10	200.00	10	200.00	10	200.00	10	200.00	50	1000.00
26	Cryogenic containers	All blocks	No.	0.35	30	11.00	30	11.00	30	11.00	30	11.00	30	11.00	150	53.00
27	Equipments for Artificial Insemination	All blocks	No.	0.50	10	5.00	10	5.00	10	5.00	10	5.00	10	5.00	50	25.00
Capacity building																
28	Training of personnel of MPCs, Union and Federation.	All blocks	No.	0.05	200	10.00	200	10.00	200	10.00	200	10.00	200	10.00	1000	50.00
29	Infertility Camps	All blocks	No.	0.20	200	40.00	200	40.00	200	40.00	200	40.00	200	40.00	1000	200.00

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
Marketing																
30	Parlour structures	All blocks	No.	5.00	20	100.00	20	100.00	20	100.00	20	100.00	20	100.00	100	500.00
31	Milk product storage cabinets	All blocks	No.	0.30	300	90.00	300	90.00	300	90.00	300	90.00	300	90.00	1500	450.00
32	Product Billing systems	All blocks	No.	0.30	20	6.00	20	6.00	20	6.00	20	6.00	20	6.00	100	30.00
Processing of value addition																
33	Dairy Processing Plants	All blocks	No.	6000.00	0	0.00	0	0.00	1	6000.00	0	0.00	0	0.00	1	6000.00
34	Refrigeration Plants	All blocks	No.	500.00	0	0.00	1	500.00	0	0.00	0	0.00	0	0.00	1	500.00
35	Water Treatment Plants. Reverse Osmosis plant	All blocks	No.	100.00	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
36	Effluent treatment plant	All blocks	No.	100.00	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
37	Steam raising plant with accessories	All blocks	No.	100.00	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
38	Fat handling equipments	All blocks	No.	200.00	0	0.00	1	200.00	0	0.00	0	0.00	0	0.00	1	200.00
39	Dairy equipments	All blocks	No.	50.00	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
Development of dairy sector																
40	BMC buildings	All blocks	No.	15.00	5	75.00	5	75.00	5	75.00	5	75.00	5	75.00	25	375.00
Grand total						1139.00		2164.00		7089.00		1089.00		1074.00		12555.00

B1- Valliyoor, B2- Radhapuram, B3- Kalakad, B4- Nanguneri, B5- Cheranmahadevi, B6- Ambasamudram, B7- Pappakudi, B8- Kadyam, B9- Alankulam, B10- Keelapavoor, B11- Palayamkottai, B12- Manur, B13- Thenkasi, B14- Kadayanallur, B15- Melaneelithanallur, B16- Sankarankovil, B17- Kuruvikulam, B18- Vasudevanallur, B19- Shenkottai

4.8 Fisheries sector

Fisheries sector is one of the important food production sector in the State contributing to the livelihood as well as food security of a large section of the economically under-privileged population. In recent years, it has assumed greater significance and its contribution towards the State and the National economy in terms of livelihood and nutritional security, rural employment generation and foreign exchange earnings have been enormous. Fisheries include marine, freshwater and brackish water sub sectors. The Fisheries sector over the years has transformed from subsistence-based artisanal activities to modern livelihood activities with the application of science and modern technologies in the field of capture fishing and culture fisheries. It is developing as a major industry with diversifications viz., exploring deep sea resources and eco-friendly aquaculture practices for culture of finfish and shell fish, ornamental fish culture, eco-tourism, fish processing parks, mid sea fish processing units, etc.,

I. Enhancement of fisheries production

Fisheries sector occupies a very important place in the socio-economic development of the country. It has been recognized as a powerful income and employment generator as it stimulates growth of a number of subsidiary industries, and is a source of cheap and nutritious food besides being a foreign exchange earner. Most importantly, it is the source of livelihood for a large section of economically backward population of the country. The main challenges facing fisheries development in the country includes accurate data on assessment of fishery resources and their potential in terms of fish production, development of sustainable technologies for fin and shell fish culture, yield optimization, harvest and post-harvest operations, landing and berthing facilities for fishing vessels and welfare of fishermen.

With increasing pressure on the world's inland and coastal marine fisheries, increases in production and quality of yield are being sought through the application of a range of enhancement techniques. Which of these is applied depends on the attitude to the natural resource by societies at different levels of economic development. The range of enhancement techniques involves increasing levels of human input and control which raise productivity significantly, but which also raise costs. Introductions have raised production in many areas of the world at the price of the risk of environmental disruption. Stocking is extremely widespread but has generally been applied uncritically. A variety of models are proposed to serve as a basis for more rigorous evaluation of biological and economic

effectiveness of this practice. Fertilization of water bodies is used to raise levels of production further. Elimination of unwanted species then becomes necessary to maximize benefits from the target species. Adjustments to the habitats within the water body assist in raising general levels of productivity which culminate in the conversion of areas of the water into fish ponds or for cage culture. This process has important implications for the social, economic and policy context which necessitates shifts in ownership, finance and education among populations where these types of development occur.

In the inland fisheries sector, aquaculture is poised to play a pivotal role in increasing fish production, ensuring food security and enhancing growth of the State's economy. To maximize fish production from an unit area and to generate maximum income to the fish farmers, the Government has initiated innovative approaches such as stocking of fast growing fish species in the short seasonal water bodies, integrating aquaculture in the existing irrigation systems / rain water harvesting systems, brood stock development to produce quality fish fingerlings, promotion of fish culture in farm ponds and introduction of cage culture in reservoirs etc. 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 substantial hikes in the annual fish production from the aquaculture sector within a span of 5 years. Hence in this district it is suggested to implement the following intervention to enhance the production and growth of fisheries with budget cost of **₹210.00** lakhs.

The interventions are

1. Promotion of quality fish marketing by traditional fishers by providing moped with ice box at Radhapuram.
2. Increasing safety at sea by providing life safety appliances to Radhapuram.
3. Improvement of hygienic fish handling by providing ice boxes in Radhapuram.
4. Resource conservation in marine sector by promotion of fishing using passive gears at Radhapuram.

II. Infrastructure and assets

Fish farming is an age old activity which is 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. Also, the fishery wealth in the inshore waters is being

overexploited due to excessive fishing pressure on the resources. Artificial reefs help in augmenting the productivity of the marine ecosystem. Artificial reefs act as habitats to marine aquatic organisms enhance the fish production through increased breeding activity and survival of young ones and act as a barrier for bottom trawling operations.

Availability of quality seed of cultivable freshwater fish species has been a limiting factor for intensification of fish farming and also for coverage of additional area under aquaculture. While availability of fish seed is satisfactory in certain parts of the country, in other areas farmers face difficulties in procurement of quality seed in required quantities. Further, the seed in such deficit areas has to be transported over long distances, which adds to the cost of inputs. Presently, there are inadequate seed rearing facilities for rearing of spawn/fry to fingerlings, even though there is a demand for stock size fingerlings. Therefore, there is every need for creation of infrastructure facilities for rearing of spawn/fry to fingerlings. Thus, availability of stock size fingerlings of cultivable freshwater fish species for stocking in reservoirs has been a limiting factor for limited fishery production from the reservoirs. Availability of fish fingerlings is satisfactory in certain parts of the country, whereas the farmers in other areas face difficulties in procurement of quality fingerlings in required quantities. Further, the fish fingerlings in such deficit areas have to be transported over a long distance, which adds to the cost of inputs. Therefore, to meet the requirement of fish fingerlings for supplementary stocking in the reservoirs and ponds/tanks, it is proposed to support the entrepreneurs/ farmers in setting up of fish seed rearing units for production of quality fish fingerlings. The budget requirement for infrastructure facilities is around ₹1165.00 lakhs.

The interventions are

1. Establishment of marine engine and sea safty training centre for fisher folk in Tamilnadu at Radhapuram.
2. Establishment of Aqua Eco Tourism center at Radhapuram.
3. Establishment of District Extension and Training centres at Radhapuram.

III. Capacity building program

Effective extension support is essential for the promotion of aquaculture in freshwater and brackish water areas. It is nesary to establish information center/ data dissemination centre at fisherman villagrs.training, village seminar, exhibition, cambaign etc., can to be organized regularly. The information centre show act as a link between the fisherman, market center and district officials.

Hence in this district it is necessary to give training to fish farmers with budget of cost of ₹67.50 lakhs.

Project components

- Establishment of modern mobile fish marketing vehicles at Radhapuram.
- Establishment of seafood knowledge highway to improve health, combat malnutrition and enhance income of fishers at Radhapuram.
- Exposure visit to fisherman to other state for Radhapuram block farmers.

Budget

The budget requirement for fulfilling the above interventions is ₹1432.50 lakhs

Implementing agency

Department of Fisheries will implement the project.

Table 4.25. Budget requirement for Fisheries sector in Tirunelveli district

(₹ in lakhs)

Sl. No.	Interventions	Blocks covered	Unit	Unit cost	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
I. Enhancement of fisheries production																
1	Promotion of quality fish marketing by traditional fishers by providing moped with ice box	Radhapuram	No	0.35	50	17.50	50	17.50	50	17.50	50	17.50	100	35.00	300	105.00
2	Increasing safety at sea by providing life safety appliances	Radhapuram	No	0.03	200	6.00	200	6.00	200	6.00	200	6.00	200	6.00	1000	30.00
3	Improvement of hygienic fish handling by providing ice boxes	Radhapuram	No	0.1	100	10.00	100	10.00	100	10.00	100	10.00	100	10.00	500	50.00
4	Resource conservation in marine sector by promotion of fishing using passive gears	Radhapuram	No	0.025	200	5.00	200	5.00	200	5.00	200	5.00	200	5.00	1000	25.00
II. Creation of infrastructure facilities																
5	Establishment of modern mobile fish marketing vehicles	Radhapuram	No	7	1	7.00	1	7.00	1	7.00	1	7.00	1	7.00	5	35.00
6	Establishment of Aqua Eco Tourism center	Radhapuram	No	15	1	15.00	0	0.00	0	0.00	0	0.00	0	0.00	1	15.00
7	Establishment of District Extension and Training centres	Radhapuram	No	1050	1	1050.00	0	0.00	0	0.00	0	0.00	0	0.00	1.00	1050.00
III. Capacity Building Program																
8	Exposure visit to farmers to other states	Radhapuram	No	0.05	50	2.50	50	2.50	50	2.50	50	2.50	50	2.50	250	12.50
IV. Research & Development																
9	Establishment of marine engine and sea safety training centre for the fisherfolk in Tamilnadu	Radhapuram	No	100	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00
10	Establishment of Seafood Knowledge Highway to improve health, combat malnutrition and enhance income of fisheries	Radhapuram	No	10	1	10.00	0	0.00	0	0.00	0	0.00	0	0.00	1	10.00

11	Creation of Marine infrastructure facilities for the fisher-folk of coastal towns and villages to enhance Marine fish production, hygienic handling of catch and prevention of Post harvest losses	Radhapuram	No	300	0	0	0	0	0	0	2	600	0	0	2	600	
Grand total							1223.00		48.00		48.00		648.00		65.50		2032.50

4.8.1 Fisheries Research

Cage Culture of fast growing food fishes in seasonal tanks

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

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

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

Project strategy

The present proposal is to demonstrate and train the inland fish farmers in cage farming of fishes and crustaceans for enhancing the production and revenue. The selected water bodies in the State districts will serve as a demo ground and dissemination centre for the technology. Appropriate cages of various sizes (from 1 to 10 m²) will be procured from

the standard cage manufacturers in the country or abroad and used for the farming purposes.

Project component

The following are the steps in this project:

- Provide awareness on hygienic handling, fish processing, health beneficial attributes of fish for Tirunelveli.
- Arranging capacity building and skill development programmes on fish processing technologies for Tirunelveli.
- Production of short films on nutritive value of fish and screening in theatres and television channels for Tirunelveli.
- Supply of preserved ready to eat and ready to cook fish products through public distribution system in Tirunelveli.
- Installation of waste rendering plant, biogas from fish waste for Tirunelveli.
- Establishment of trap setting vessel to impart eco-friendly fish trapping technology among the fisherman of Tamil Nadu for Tirunelveli.
- Encouraging indigenous of e-interface gadgets for sustainable aquaculture and synchronized harvester for fresh water aquaculture to Tirunelveli.
- Design and development of solar powered tricycle for fish vendor in Tirunelveli.
- Design and development of gadgets for fish processing in Tirunelveli.
- Development of cost effective navigative gadgets for effective fishing in Tirunelveli

Budget

The proposed intervention will be implemented with a budget outlay of ₹. **2021.42** lakhs.

Project implementing agency

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

Expected outcome

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

Table 4.26 Budget for implementation of Fisheries in Tirunelveli district

(₹ 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	Harvest and Post harvest														
a	Reduction of post harvest losses														
	Awareness to fishers on hygienic handling of fish	0.005	Tirunelveli	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	Tirunelveli	25	15.00	25	15.00	25	15.00	25	15.00	25	15.00	125	75.00
	Capacity building and skill development programmes on fish processing technologies	6.6	Tirunelveli	13	85.80	13	85.80	13	85.80	13	85.80	13	85.80	65	429.00
b	Enhancement of per capita consumption of fish														
	Awareness campaign on health beneficial attributes of fish	0.005	Tirunelveli	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	Tirunelveli	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00	1	50.00
g	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	Tirunelveli	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	Tirunelveli	0	0.00	1	12.90	0	0.00	0	0.00	0	0.00	1	12.90
	Supply chain management to promote	64.5	Tirunelveli	0	0.00	1	64.50	0	0.00	0	0.00	0	0.00	1	64.50

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
	consumption of farmed freshwater fishes														
i	Utilization of fish processing waste and by catch														
	installation of waste rendering plant at selected fishing harbors and fish markets	130	Tirunelveli	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	Tirunelveli	0	0.00	1	65.00	0	0.00	0	0.00	0	0.00	1	65.00
	Installation of unit for biogas from fish waste	161.5	Tirunelveli	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	Tirunelveli	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
ii	fishing technology														
	Establishment of trap setting vessel to impart eco friendly fish trapping technology among the fishermen of Tamil Nadu	300		1	300.00	0	0.00	0	0.00	0	0.00	0	0.00	1	300.00
3	Fish resource management and conservation														
b	Indigenous fisheries resource conservation centres														
	Freshwater (River Tamirabharani and Cauvery)	200	Tirunelveli	0	0.00	1	200.00	0	0.00	0	0.00	0	0.00	1	200.00
c	Stock enhancement and ranching center for	300	Tirunelveli	0	0.00	0	0.00	1	300.00	0	0.00	0	0.00	1	300.00

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
	indigenous fishes														
4	Fisheries Engineering														
i	Aquacultural engineering														
a	Farm implements														
	Deisgn and development of e interface gadgets for sustainable aquaculture	20	Tirunelveli	0	0.00	1	20.00	0	0.00	0	0.00	0	0.00	1	20.00
b	Harvesters														
	Deisgn and development of synchronised harvester for freshwater aquaculture	30	Tirunelveli	0	0.00	1	30.00	0	0.00	0	0.00	0	0.00	1	30.00
d	Automation technologies														
	Development of mobile gadgets/apps for remote monitoring system for aquaculture farms	15	Tirunelveli	0	0.00	0	0.00	1	15.00	0	0.00	0	0.00	1	15.00
ii	Navigation and Fisheries Engineering														
	Development of cost effective gadgets for effective fishing	15	Tirunelveli	1	15.00	0	0.00	0	0.00	0	0.00	0	0.00	1	15.00
	Development of mobile apps for effective fishing	8	Tirunelveli	0	0.00	0	0.00	0	0.00	0	0.00	1	8.00	1	8.00
iii	Post-harvest fisheries engg														
a	Handling, transportation and storage														
	Design and development of solar powered tricycle for fish vendors	2	Tirunelveli	1	2.00	1	2.00	1	2.00	1	2.00	0	0.00	4	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
b	Processing machines														
	Design and development of gadgets for fish processing	20	Tirunelveli	0	0.00	0	0.00	0	0.00	1	20.00	0	0.00	1	20.00
	Grand total				418.73		900.53		468.73		123.73		109.73		2021.43

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.9 Public Works Department

1. Increasing the ground water level

The water resource organization of the Public Works Department have indicated a number of proposals for harnessing water resources as well as for reducing the losses from existing canals irrigation projects. As many of the old irrigation systems are in deteriorating condition and in a state of disrepair, it is absolutely necessary to rehabilitate and/or to carry out the repair works so as to economize the water use and improve the conveyance efficiency and water use efficiency as well. It is hoped that better water control and delivery could be achieved by these measures so that the productivity per unit of water could be enhanced sufficiently.

2. Project components

- Repair and rehabilitation of surplus weir of Narparikulam, Amachiyarkulam, Pambankulam, Thiruppathikulam, Chittenkulam, Karuppilankulam of Valliyoor block.
- Removal of silt and slipped earth in supply channel in Narparikulam of Valliyoor block.
- Repair and rehabilitation of sluice in Narparikulam, Pandiyanpudhukulam, Nos. 1, 2, 3 of Kaikulam, Sirunambikulam, Nos. 1, 2 of Kalkarikulam, Veerakulam, Vinayagarpudhukulam, Punjakatykulam of Valliyoor block.
- Rehabilitation and strengthening the bund of Narparikulam, Amachiyarkulam, Pandiyanpudhukulam, Pambankulam, Thandayarkulam, Sirunambikulam, Pattarkulam, Chettipudhukulam, Manimalayankulam, Vinayagarpudhukulam, Malayankulam, Mithiyankulam in Valliyoor block.
- Repair & Rehabilitation of cross drainage structures in upper and lower contour canal in Alathuraiyur diversion.
- Repair and rehabilitation of Perankudy anaicut across Hanumanathi river in valliyoor block of Perankudy village.

3. Budget

It is proposed to incur Rs. **401.00** lakhs over a period of five years

4. 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.

5. Implementing agency

Department of Public Works will implement the project.

Table 4.27 Budget estimate for PWD sector in Tirunelveli district

(₹. in lakhs)

Sl. No.	Name of Scheme	Block Covered	Unit	Unit cost	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
1	Repair and rehabilitaion of surplus weir of Nariparaikulam in Levengipuram village	Valliyoor	Ha	1.25	8	10.00	0	0.00	0	0.00	0	0.00	0	0.00	8	10
2	Rehabilitation and strengthening the bund of Nariparaikulam in Levengipuram village	Valliyoor	Ha	1.25	8	10.00	0	0.00	0	0.00	0	0.00	0	0.00	8	10
3	Removal of silt and slipped earth in supply channel to Nariparaikulam in Levengipuram village	Valliyoor	Ha	0.38	8	3.00	0	0.00	0	0.00	0	0.00	0	0.00	8	3
4	Repair and rehabilitaion of sluice of Nariparaikulam in Levengipuram village	Valliyoor	Ha	0.25	8	2.00	0	0.00	0	0.00	0	0.00	0	0.00	8	2
5	Repair and rehabilitaion of surplus weir of Amachiyarkulam in Erukkanthurai Part II village	Valliyoor	Ha	2.05	0	0.00	3	6.00	0	0.00	0	0.00	0	0.00	3	6
6	Rehabilitation and strengthening the bund of Amachiyarkulam in Erukkanthurai Part II village	Valliyoor	Ha	3.08	0	0.00	3	9.00	0	0.00	0	0.00	0	0.00	3	9
7	Rehabilitation and strengthening the bund of PandiyanPudukulam in Erukkanthurai Part II village	Valliyoor	Ha	3.08	0	0.00	3	9.00	0	0.00	0	0.00	0	0.00	3	9
8	Repair and rehabilitaion of Sluice of PandiyanPudukulam in Erukkanthurai Part II village	Valliyoor	Ha	1.13	0	0.00	8	9.00	0	0.00	0	0.00	0	0.00	8	9

Sl. No.	Name of Scheme	Block Covered	Unit	Unit cost	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
9	Repair and rehabilitaion of surplus weir of Pambankulam in Thandayarkulam village	Valliyoor	Ha	2.10	0	0.00	4	9.00	0	0.00	0	0.00	0	0.00	4	9
10	Rehabilitation and strengthening the bund of Pambankulam in Thandayarkulam village	Valliyoor	Ha	2.10	0	0.00	4	9.00	0	0.00	0	0.00	0	0.00	4	9
11	Repair and rehabilitaion of Sluice Nos.I, II & III of Kaikulam in Thandayarkualm village	Valliyoor	Ha	0.55	0	0.00	46	25.00	0	0.00	0	0.00	0	0.00	46	25
12	Rehabilitation and strengthening the bund of Kaikulam in Thandayarkualm village	Valliyoor	Ha	0.33	0	0.00	46	15.00	0	0.00	0	0.00	0	0.00	46	15
13	Rehabilitation and strengthening the bund of Sirunambikulam in Thandayarkualm village	Valliyoor	Ha	1.68	0	0.00	5	9.00	0	0.00	0	0.00	0	0.00	5	9
14	Repair and rehabilitaion of Sluice of Sirunambikulam in Thandayarkualm village	Valliyoor	Ha	1.31	0	0.00	5	7.00	0	0.00	0	0.00	0	0.00	5	7
15	Repair and rehabilitaion of Sluice No.I& II of Kalkaraikulam in Veppilankulam village	Valliyoor	Ha	0.85	0	0.00	0	0.00	24	20.00	0	0.00	0	0.00	24	20.00
16	Rehabilitation and strengthening the bund of Pattarkulam in Radhapuram Village	Radharuram	Ha	0.21	0	0.00	0	0.00	47	10.00	0	0.00	0	0.00	47	10.00
17	Repair and rehabilitaion of Sluice of Veerakulam in Radhapuram village	Radharuram	Ha	1.11	0	0.00	0	0.00	0	0.00	8	9.00	0	0.00	8	9.00
18	Rehabilitation and strengthening the bund of Chettiputhukulam in Radhapuram Village	Valliyoor	Ha	4.55	0	0.00	0	0.00	0	0.00	2	9.00	0	0.00	2	9.00
19	Rehabilitation and strengthening the bund	Valliyoor	Ha	2.64	0	0.00	0	0.00	0	0.00	3	9.00	0	0.00	3	9.00

Sl. No.	Name of Scheme	Block Covered	Unit	Unit cost	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	of Manimalayankulam in Perunkudy Part II Village															
20	Repair and rehabilitaion of Sluice of Vinayagarputhukulam in Perunkudy Part II village	Valliyoor	Ha	0.82	0	0.00	0	0.00	0	0.00	11	9.00	0	0.00	11	9.00
21	Rehabilitation and strengthening the bund of Vinayagarputhukulam in Perunkudy Part II village	Valliyoor	Ha	0.82	0	0.00	0	0.00	0	0.00	11	9.00	0	0.00	11	9.00
22	Repair and rehabilitaion of Sluice of Punjakattykulam in Perunkudy Part II village	Valliyoor	Ha	0.62	0	0.00	0	0.00	0	0.00	0	0.00	14	9.00	14	9.00
23	Repair and rehabilitaion of surplus weir of Thiruppathikulam in Pazhavor Part II village	Valliyoor	Ha	1.90	0	0.00	0	0.00	0	0.00	0	0.00	5	10.00	5	10.00
24	Repair and rehabilitaion of surplus weir of Chittalamkulam in Therrukarunkulam village	Valliyoor	Ha	2.42	0	0.00	0	0.00	0	0.00	0	0.00	4	10.00	4	10.00
25	Rehabilitation of cross drainage structures of Upper contour canal in Alathuraiyar diversion scheme	Valliyoor	No	50.00	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00	1	50.00
26	Repair & Rehabilitation of cross drainage structures in Lower contour canal in Alathuraiyar diversion scheme	Valliyoor	No	25.00	0	0.00	0	0.00	0	0.00	0	0.00	1	25.00	1	25.00
27	Repair & Rehabilitation of PerunkudyAnicut across Hanumanathi river in Perunkudy village	Valliyoor	Ha	0.50	0	0.00	0	0.00	0	0.00	0	0.00	79	40.00	79	40.00

Sl. No.	Name of Scheme	Block Covered	Unit	Unit cost	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
28	Repair and rehabilitaion of surplus weir of Karuppilankulam in Dhanakkarkulam village	Valliyoor	Ha	0.98	0	0.00	0	0.00	0	0.00	0	0.00	10	10.00	10	10.00
29	Rehabilitation and strengthening the bund of Malayankulam in Therkkukarunkulam village	Valliyoor	Ha	1.90	0	0.00	0	0.00	0	0.00	0	0.00	5	10.00	5	10.00
30	Rehabilitation and strengthening the bund of Mithiyankulam in Erukkanthurai Part I village	Valliyoor	Ha	4.23	0	0.00	0	0.00	0	0.00	0	0.00	7	30.00	7	30.00
	Grand total					25.00		107.00		30.00		45.00		194.00		401.00

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

4.10. Co operation

In Tamil Nadu, Cooperatives play a prominent role in the day to day affairs of the common man. They help the farmer to improve agricultural production by providing crop loans and by supplying agricultural inputs such as fertilizers and insecticides. They also enable the farmer to store and market his produce. In most districts, cooperatives run the fair price shops which provide the rural and urban poor essential commodities at highly subsidized prices. The policy of the State Government is to ensure adequate availability of essential commodities of acceptable quality at an affordable price to the general public particularly the poor. Public Distribution System has been one of the most crucial elements in food policy and food security system in the country.

Cooperatives all over the world have become an effective and potential instrument of economic development. The Cooperative Movement in Tamil Nadu has witnessed over the decades substantial growth in diverse areas of economy. There is not a single major sphere of economic activity which has not been touched by Cooperatives. Cooperatives are also envisaged as an instrument for implementing many important policies like agricultural credit, urban credit, market intervention, price support for agricultural commodities through Cooperative Wholesale stores, Public Distribution system etc. The office infrastructure has to be improved. The intervention is proposed for creating infrastructure facilities.

Project components

- Office Infrastructure such as construction of office building in Kuruvikulam, Alankulam, Keelpavoor, Manur, Melaneelithunur, Naguneri, Mukuddal, Kalakadu, Shencottai, Tenkasi, Valliyoor, Vasudevanallur.
- Construction of compound wall in all blocks except Alankulam, Ambasamuthram, Cheranmahadevi, Kadayam, Kadayanallur, Kuruvikulam.
- Office building renovation at all blocks except Ambasamuthram, Kadayanallur, Kalakadu and Keelpavoor.
- Construction of shopping complex and tender hall at Palayamkottai, Valliyoor.
- Provide AC for Naguneri, Manur, Melaneelithunur, Palayamkottai, Palayamkottai, Kalakadu, Tenkasi, Keelpavoor, Alankulam, Vasudevanallur.
- Provide furniture to Kuruvikulam, Keelpavoor, Manur, Melaneelithunur, Naguneri, Palayamkottai, Mukuddal, Kalakadu, Shencottai, Valliyoor, Vasudevanallur.

- Construction of processing unit Mukuddal, Sankarankoil.

Capital Asset Creation

- Godown renovation at Kuruvikulam, Kuruvikulam, Palayamkottai , Mukuddal, Valliyoor, Tenkasi, Kadayanallur, Vasudevanallur.
- Construction of godown in Kalakadu, Kuruvikulam, Naguneri, Palayamkottai, Vasudevanallur.
- Establishment of drying yard and tractor shed at Vasudevanallur.

Budget

It is proposed to incur **Rs. 1876.21** lakh over a period of five years.

Implementing agency

Department of Cooperation will be implementing the project.

Table. 4.28. Budget estimate for Co- operation

(Rs.in lakhs)

Sl. No.	Interventions	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
			Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Infrastructure													
1	Construction of Compound wall	B7,B9,B10,B12, B13,B11,B6,B16, B17,B18,B19	22	113.91	6	19.06	9	62.96	9	53.40	2	9.38	48	258.71
2	Construction of Godown	B6,B8,B12,B13,B19	7	100.58	2	22.75	1	12	0	0.00	0	0.00	10	135.33
3	Construction of Office Building	B1,B7,B9,B10, B12,B13,B11, B6,B16,B17, B18,B19	7	164.55	7	93.23	13	162.48	8	109.40	5	84.90	40	614.56
4	Construction of Ration Shop	B15	0	0.00	0	0.00	1	6.25	0	0.00	0	0.00	1	6.25
5	Construction of Road	B18	0	0.00	0	0.00	0	0	1	15.00	0	0.00	1	15.00
6	Construction of Tender Hall	B13,B18	0	0.00	5	62.00	0	0	0	0.00	0	0.00	5	62.00
7	Constuctuion of Drying Yard	B19	0	0.00	0	0.00	0	0	0	0.00	1	6.34	1	6.34
8	Establishment of Processing unit	B11,B15	1	56.70	0	0.00	0	0	0	0.00	1	16.95	2	73.65
9	Establishment of Tractor Shed	B19	0	0.00	1	8.00	1	8	0	0.00	0	0.00	2	16.00
10	Renovation of Godown	B8,B10,B13, B11,B18,B17,B5,B19	8	54.00	4	27.08	4	9.25	3	12.50	1	14.50	20	117.33
11	Renovation of Office	B3,B4,B12,B9,B10,	10	29.80	41	111.06	34	159.33	13	25.03	12	28.41	110	353.63

Sl. No.	Interventions	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
	Building	B8,B13,B11,B6, B18,B17,B16, B7,B1,B19												
12	Shopping complex Construction	B13,B18	0	0.00	0	0.00	2	32	0	0.00	0	0.00	2	32.00
13	Strong Room construction	B8,B15	0	0.00	1	3.00	3	16.5	1	4.00	0	0.00	5	23.50
14	Strengthening of Cooperation Centres (Furniture's, Solar panel, Modern counter, Xerox machine, Air Conditioner, CCTV Camera, Bore well, Generator, UPS Battery, Cash Counting Machine, Invertor, Jewel Weighing Machine, Packing Machine, Purchase of computer and peripherals, Hand Billing machine, LED Display for tender process, Purchase of Jewel Carat Meter, Smart Card Printing Machine, Burglary Alarm, Agricultural Equipments, Safety Locker, Purchase of Display racks, Defender Door, Purchase of Paddy drying machine, Automatic Printer	All Blocks	24	15.75	33	33.78	28	48.07	27	36.92	3	27.39	115	161.91

Sl. No.	Interventions	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
			Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	machine, Conveyer, E-Tender process, Fork Lifter, Gunny Bag Stitching machine, Jewel tester, Pallets, Tarpaulin, Trolley and Printing Press machineries)													
	Total			535.29		379.96		516.84		256.25		187.87		1876.21

Alankulam - B1, Ambasamudram - B2, Cheranmahadevi - B3, Kadayam - B4, Kadayanallur - B5, Kalakadu - B6, Keelpavoor - B7, Kuruvikulam - B8, Manur - B9, Melaneelithanallur - B10, Mukuddal - B11, Naguneri - B12, Palayamkottai - B13, Radhapuram - B14, Sankarankoil - B15, Shencottai - B16, Tenkasi - B17, Valliyoor - B18 & Vasudevanallur - B19

Table 4.29. Consolidated Budget for Tirunelveli District**(₹. in lakhs)**

Sl. No.	Components	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	3175.73	3532.52	4009.22	3326.06	2642.82	16686.35
2	Agricultural Research (TNAU)	160.00	20.00	35.00	10.00	0.00	225.00
3	Horticulture	3751.37	3757.79	3724.45	3693.83	3765.78	18693.22
4	Agricultural Engineering	990.36	1670.55	1694.10	793.88	850.41	5999.30
5	Agricultural Marketing	2128.65	929.34	247.40	112.60	118.60	3536.59
6	Seed Certification & Organic Certification	23.36	14.36	1.00	1.00	1.00	40.72
7	Animal Husbandry	2429.09	2113.00	2571.24	1079.14	2030.49	10222.96
8	Animal Science Research (TANUVAS)	1140.90	1290.90	632.90	482.90	266.50	3814.10
9	Dairy Development	1139.00	2164.00	7089.00	1089.00	1074.00	12555.00
10	Fisheries	1223.00	48.00	48.00	648.00	65.50	2032.50
11	Fisheries Research (TNFU)	418.73	900.53	468.73	123.73	109.73	2021.45
12	Public Works Department (WRO)	25.00	107.00	30.00	45.00	194.00	401.00
13	Civil Supplies & Co-Operation	535.29	379.96	516.84	256.25	187.87	1876.21
	Grand total	17140.48	16927.95	21067.88	11661.39	11306.70	78104.4

The total budget requirement for the implementation of various interventions by different departments in Tirunelveli district is **₹. 78104.4 Lakhs.**

