NATIONAL AGRICULTURE DEVELOPMENT PROGRAMME (NADP)

DISTRICT AGRICULTURE PLAN

VILLUPURAM

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

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2017

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EXECUTIVE SUMMARY

Villupuram District is situated in the north eastern zone of Tamil Nadu. It is the fourth largest District and basically depends on Agriculture. This District is spread in an area of 8,204.63 Sq.km. The District comprises of eleven (11) taluks and twenty two (22) blocks. The predominant crops of this District are *viz,.*Rice, Sugarcane, Groundnut, Maize, Cumbu, Ragi, Cotton, Seasame, Black gram and Greengram.Though villupuram District is industrially backward but flourishes with modern ricemills and sugarmills. This District lies between 11°N and 12°S latitude and 78°W and 80°E longitude and nearer to Chennai.

Villupuram District has more than 30 km of coastal line and well connected by rail and the total length of railway lines in the District is about 180 km. Good network of roads for surface transport is also available. The total road length is about 2961 km of which national highway accounts for 124 km. Villupuram District enjoys the nearby location of union territory Pondicherry, Trichy, Salem and Thiruvannamalai which plays a vital role in marketing of agriculture produces. The weaknesses of this District are *viz.,* uneven rainfall, and heavy downpour in coastal areas especially during North East monsoon, seasonal rivers and fragmented land holdings.

There is scope for the formation of self help groups, on the account of presence of poor, down trodden and SC/ST population. There is also good scope for the development of mineral industries.

The District population is approximately 34.58 lakhs in 2011 as against 29.60 lakhs in 2001. The sex ratio of the District is about 941females for 1000 males in 2011. All the towns, villages, hamlets and tribal villages have been electrified in the District. Silica sand, river sand, black granite, blue mental and gravel are the mineral resources available in the District. The District receives the maximum rainfall during the North East monsoon season. The major sources of irrigation are open dug and tube wells. Most of the blocks have reached the over exploited stage in ground water. About 76 percent of the land holders own less than one hectare of land in this District.

The food crops *viz*., Rice, Millets, Pulses and Oil seeds are cultivated in an average area of four lakh hectare every year. SWOT analysis is one of the management techniques applied in preparing the District plan. Technology adoption and area increasing are the major strategies planned for agriculture development. Distribution of soil health cards, vermicomposting,drip irrigation are other innovative activities planned for increasing the

productivity with minimum water usage. Distribution of micro nutrient mixture, bio fertilizer, gypsum and green manure seeds, supply of implements at subsidized cost, Farmer Field School (FFS), pipeline distribution, construction of rural godowns, farmers training, strengthening of Agricultural University and state seed farms are the major intervention planned for agricultural development in the District. Allied agricultural sectors like, Horticulture, Agricultural Engineering, Public Works Department. Animal Husbandry is also equally important for the development of the District. Tapioca, cashew and Casuarina are other important crops accounting for the major cultivated area of the District. The major development activities proposed under horticulture are net house structure, nursery and vegetable production, pandal for gourds production, plastic gates for vegetable handling and transport farm waste shredder, high density planting, banana bunch corer, disease free planting materials, sales outlet point, interstate exposure visit, Mango and Amla in noon meal scheme.

In Agricultural mechanization, distribution of labour saving equipments, *viz.,* improved Seed drill, Rotavator, Power tiller, Power weeder, larger leveled at subsidized cost plays a vital role in executing the District agriculture plan. In Agriculture marketing, facilitation of contract farming between farmers and bulk buyers in the state, arrangement of buyers' sellers meet, organizing exposure visit to important trade centers, strengthening of regulated market and sandies are also other major ones. In Animal husbandry genetic improvement of cattle and buffaloes enhancement of milk production, development of fodder banks, improvement of livestock health and layer farming are the activities for the development of Animal Husbandry. Construction of cold room facility for milk storage, installation of bulk milk cooler centre, establishment of feed mixing unit and 50 mobile artificial insemination centre's are other development activation. In fisheries, sea ranching programme, installation of artificial reefs, assistance to private fish seed rearing/fish seed production with 50% subsidy, repair works to existing fish nurseries to increase fish seed production, supply of Moped fitted with ice box and supply of fishing implements (nets) at 50% subsidized cost. Capacity building and training to fish farmers, establishment of backyard ornamental fish farming and breeding unit, establishment of modern fish stall are the interventions for the fisheries development in the District. Anicut, supply channels, tanks, field channel, Manimutharunadhi dam development activities are the activities planned for the Vellar basic sub division Kallakurichi. Strengthening of tank bund by desilting of tank, repairs, reconstruction of sluices and weirs, strengthening of distributaries, field channel are some interventions in the middle Pennaiyar basin division.

Summary of the total budget planned for the development of agricultural and allied agricultural sectors in Villupuram District is shown below.

Budget Abstract for Villupuram District

(₹. in lakhs)

Sl. No	Sectors	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	20909.36	32071.94	30840.23	32649.08	35199.49	151670.10
2	Agriculture Research (TNAU)	31.00	500.00	0.00	50.00	0.00	581.00
3	Horticulture	15185.27	15047.61	15381.41	15720.71	17005.32	78340.32
4	Agricultural Engineering	3233.98	3235.75	2751.36	2739.19	2773.88	14734.16
5	Agricultural Marketing	881.41	299.29	1411.54	294.04	630.04	3516.32
6	Seed Certification and Organic certification	18.36	0.00	13.36	0.00	0.00	31.72
7	Animal Husbandry	3660.75	3737.75	3557.75	3277.75	3167.75	17401.75
8	Dairy Development	1465.00	1570.00	5684.00	8561.00	1673.00	18953.00
9	Fisheries	1538.00	145.58	149.78	154.98	178.78	2167.12
10	Fisheries Research (TNFU)	568.73	670.53	198.73	123.73	109.73	1671.45
11	PWD	365.00	1525.00	739.00	497.00	227.00	3353.00
12	Cooperation	183.69	151.45	152.35	129.11	121.40	738.00
	Grand total	**48040.55**	**58954.9**	**60879.51**	**64196.59**	**61086.39**	**293157.94**

The plan outlay for five years (2017-22) for Villupuram district showed that of the different activities, Agriculture sector requires huge financial outlay (**₹.**151670.10 lakhs) of the total plan outlay of ₹. 293157.94 lakhs. Greater emphasis has been given to increase the productive potential of Agricultural crops in Villupuram district.

CHAPTER I

INTRODUCTION

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

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

Objectives of RKVY

a. To strengthen the farmers' efforts through creation of required pre and post-harvest agri-infrastructure that increases access to quality inputs, storage, market facilities etc. and enable farmers to make informed choices.

b. To provide autonomy, flexibility to States to plan and execute schemes as per local/ farmers' needs.

c. To promote value chain addition linked production models that will help farmers increase their income as well as encourage production/productivity

d. To mitigate risk of farmers with focus on additional income generation activities - like integrated farming, mushroom cultivation, bee keeping, aromatic plant cultivation, floriculture etc.

e. To attend national priorities through several sub-schemes.

f. To empower youth through skill development, innovation and agri- entrepreneurship based agribusiness models that attract them to agriculture.

District and State Agriculture Plans

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

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

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

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

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

The Process

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

Revision and Updation of DAP and SAP in Tamil Nadu

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

Methodology followed

The revision of the District Agricultural Plan of Villupuram 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

2.1. District at a glance

Villupuram District was earlier a part of Cuddalore District (South Arcot). It was then bifurcated from Cuddalore and became a separate district on 30th September 1993. Because of this, the history of Villupuram district closely resembles that of Cuddalore. The Cholas were the early rulers. Among these rulers, Karikala Chola was the most famous and powerful. Villupuram district is the 23rd district of the Tamil Nadu state. It has been formed by bifurcating, the erstwhile composite South Arcot district and commenced functioning since 30th September 1993 with Villupuram as its Head Quarters. It is the fourth largest district in Tamil Nadu and is predominantly an agrarian district.

2.2. Area, Location and Geographical features

The district is located in the northern part of Tamil Nadu and close to the state capital of Chennai at a distance of about 100 Kms from its northern border. The district head quarter of Villupuram is about 160 Kms from Chennai. The boundaries of the district are Bay of Bengal and Union Territory of Pondicherry in the East, and Kancheepuram and Tiruvannamalai districts in the North, Cuddalore and Perambalur districts in the South and Dharmapuri and Salem districts in the West.

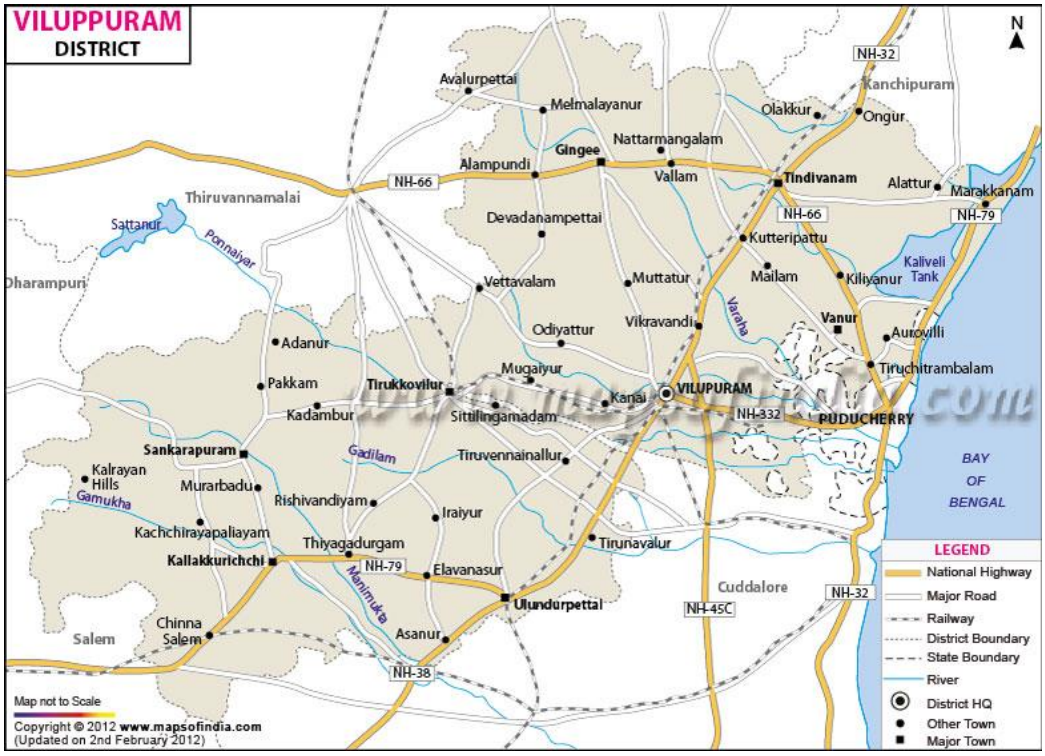

Fig. 1 Map showing Villupuram district

Villupuram district lies between 11° N and 12° S latitude and 78 ° W and 80 °E longitude with an area of 722203 hectares. Villupuram district situated in the North Eastern agro-climatic zone of Tamil Nadu is one of the agrarian based districts with over 60.2% of the population engaged in agriculture (Fig. 1)

2.3 Administrative structure

The district sprawls over an area of 8,204.63 Sq. kms spread in 1486 villages. The district comprises of 8 taluks and 22 blocks, 54 revenue Firkas and 1490 revenue villages. There are three municipalities, 15 town panchayats, 22 panchayat unions and 1104 village panchayats in this district and the names of taluks and their extent of area is shown in Fig 2 and table 2.1**.**

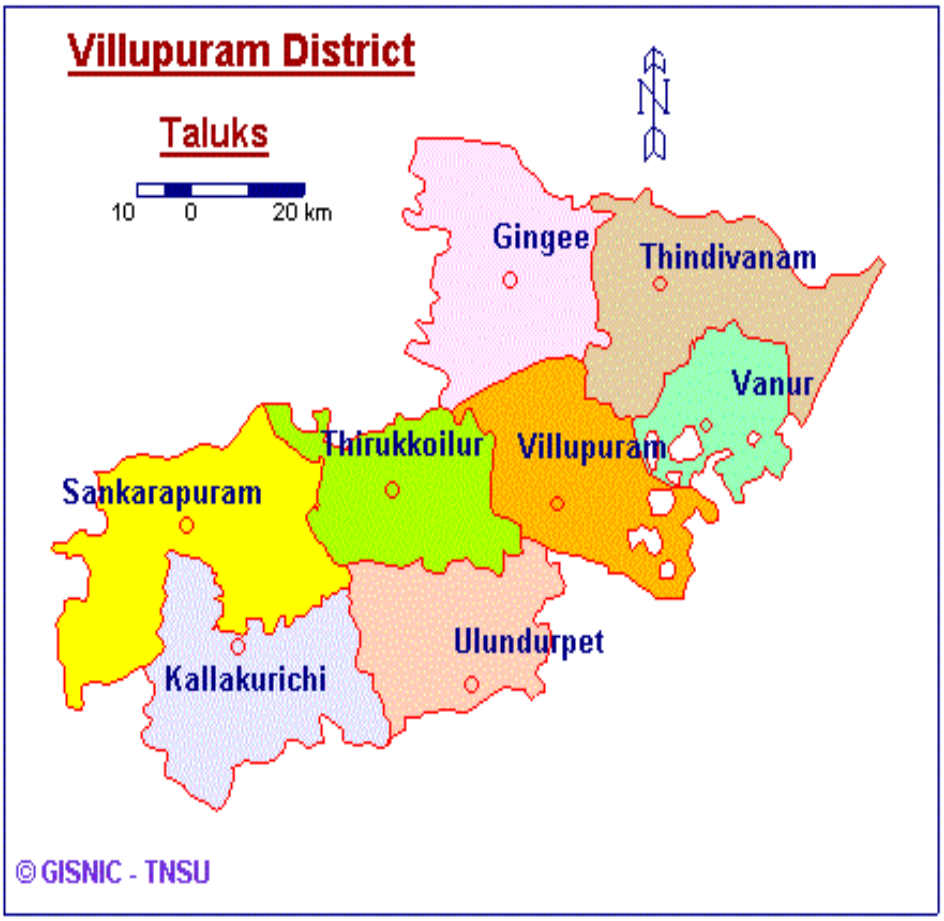

Fig. 2 Map showing Taluks in the District

Table 2.1 Name of Taluks and their extent in Villupuram District

Sl.No.	Name of the Taluk	Area in Sq. Km.
1.	Sankarapuram	1,414.21
2.	Gingee	1,151.84
3.	Kallakurichi	1,132.05
4.	Tindivanam	1,121.51
5.	Villupuram	1,013.34
6.	Thirukoilur	839.30
7.	Ulundurpet	819.61
8.	Vanur	712.77
District Total		**8,204.63**

Source: http://www.Villupuram.tn.nic.in/

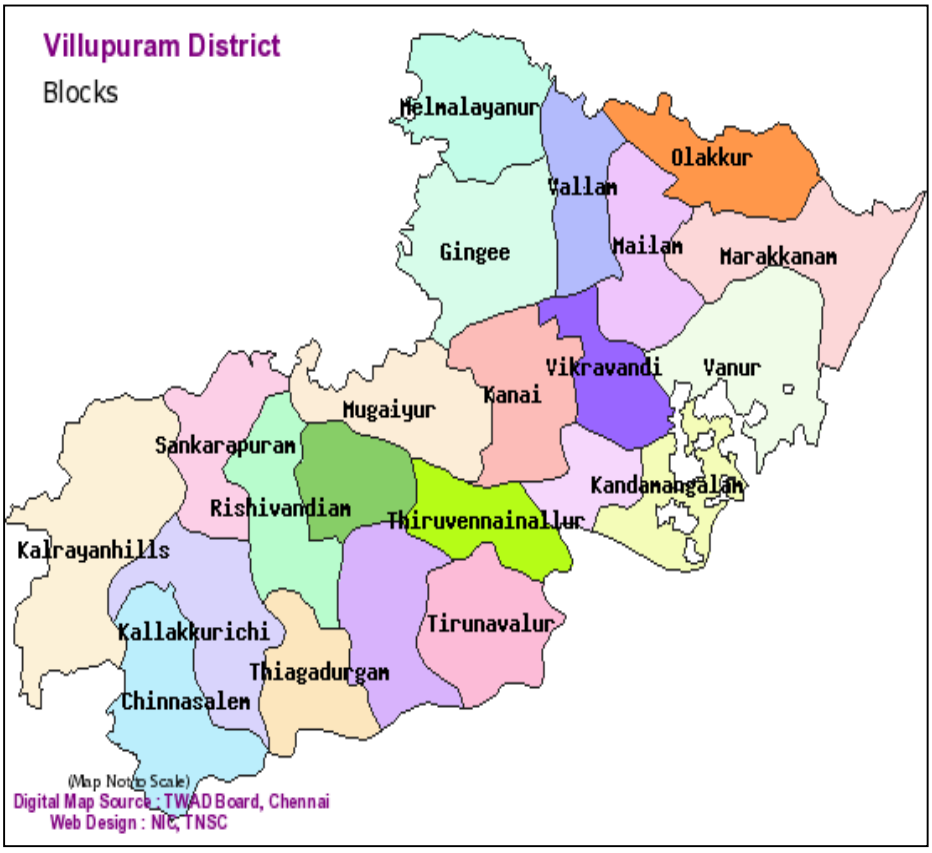

Fig. 3 Map showing different blocks in Villupuram district

The different blocks in the district is depicted in the Fig.3

Table 2.2 Revenue Administration

Revenue Administration	
1. Divisions (4)	Villupuram, Tindivanam, Thirukovilur and Kallakurichi
2. Taluks (11)	Villupuram, Vikkaravandi (since from12.02.2014), Vanur, Tindivanam, Gingee, Thirukovilur, Ulundurpet, Kallakurichi, Chinnaselam (since from 12.10.2012), Sankarapuram and Marakkanam (since from 04.02.2015)
3. Firkas	56
4. Revenue Villages	1490
Local Administration	
1. Municipalities (3)	Villupuram, Tindivanam and Kallakurichi
2. Panchayat Unions (22)	Koliyanur, Kandamangalam, Vanur, Vikkaravandi, Kanai, Olakkur, Mailam, Marakkanam, Vallam, Melmalaiyanur, Gingee, Thiukovilur, Mugaiyur, Thiruvennainallur, Ulundurpet, Thirunavalur, Kallakurichi, Chinnaselam, Sankarapuram, Thiyagadurgam, Rishivandiyam, Kalvarayan Hills.
3. Town Panchayats (15)	Vikkaravandi, Valavanur, Kottakuppam, Marakkanam, Gingee, Ananthapuram, Manalurpet, Arakandanallur Thirukoilur, T.V.Nallur, Ulundurpet, Sankarapuram, Vadakkanandal, Thiyagadurgam, Chinnaselam.
4. Village Panchayats	1099

2.4 Demographic profile

2.4.1 Population

Villupuram district has a total population of 29,60,373 (as per 2001 Census), of which males accounted for 14,92,442 (50.41 per cent) and females accounted for 14,67,931 (49.59 per cent). The urban population according to 2001 Census was 4,26,917 (14.42 per cent) and the rural population was 25,33,456 (85.58 per cent). Density of the population in the district per sq. km. is 412. As per the Census 2011, the district human population is approximately 34.58 lakhs as compared to 29.60 lakhs in 2001 Census. The sex ratio works out to 985 in 2011 as against 967 in 1991. This shows a growth rate of 16.99 per cent over two decades.

Table 2.3 Basic Demographic Details of Villupuram District (Numbers)

Demographic Details	I991	2001	2011
Male	14,03,434	14,92,442	**17,40,819**
Female	13,52,240	14,67,931	**17,18,054**
Total	**27,55,674**	**29,60,373**	**34,58,873**
Population (in"000")	2,756	2,960	3,458
Density per SQ.KM	380	406	412
Sex Ratio (No. of females per 1000 Males	967	984	985

Source: http://www.Villupuram.tn.nic.in 2011)

Table.2.4.Taluk-wise SC, ST and Total Population in Villupuram District

Sl. No	Name of the Taluk		Total Population			SC Population			ST Population		
			Male	Female	Total	Male	Female	Total	Male	Female	Total
1	Villupuram	U	72,614	73,260	1,45,874	10,137	10,621	20,758	323	343	666
		R	2,76,792	2,74,903	5,51,695	84,184	84,711	1,68,895	2,286	2,245	4,531
		T	**3,49,406**	**3,48,163**	**6,97,569**	**94,321**	**95,332**	**1,89,653**	**2,609**	**2,588**	**5,197**
2	Gingee	U	17,163	16,774	33,937	3,569	3,450	7,019	144	162	306
		R	1,96,346	1,93,659	3,90,005	44,549	43,351	87,900	4,082	4,080	8,162
		T	**2,13,509**	**2,10,433**	**4,23,942**	**48,118**	**46,801**	**94,919**	**4,226**	**4,242**	**8,468**
3	Tindivanam	U	47,336	47,494	94,830	9,871	9,984	19,855	295	304	599
		R	1,76,189	1,75,663	3,51,852	63,964	63,641	1,27,605	2,743	2,823	5,566
		T	**2,23,525**	**2,23,157**	**4,46,682**	**73,835**	**73,625**	**1,47,460**	**3,038**	**3,127**	**6,165**
4	Vanur	U	15,690	16,036	31,726	1,876	2,012	3,888	50	56	106
		R	83,132	81,564	1,64,696	29,388	28,977	58,365	1,257	1,256	2,513
		T	**98,822**	**97,600**	**1,96,422**	**31,264**	**30,989**	**62,253**	**1,307**	**1,312**	**2,619**
5	Tirukkovilur	U	27,046	27,025	54,071	4,762	4,652	9,414	306	328	634
		R	1,99,019	1,93,441	3,92,460	63,949	61,974	1,25,923	1,042	1,082	2,124
		T	**2,26,065**	**2,20,466**	**4,46,531**	**68,711**	**66,626**	**1,35,337**	**1,348**	**1,410**	**2,758**
6	Sankarapuram	U	7,818	7,846	15,664	1,151	1,153	2,304	41	46	87
		R	1,98,257	1,94,049	3,92,306	54,449	53109	1,07,558	23,766	23,491	47,257
		T	**2,06,075**	**2,01,895**	**4,07,970**	**55,600**	**54,262**	**1,09,862**	**23,807**	**23,537**	**47,344**
7	Kallakkurichi	U	59,717	59,535	1,19,252	11,438	11,452	22,890	612	454	1,066
		R	1,75,116	1,71,768	3,46,884	66,793	66,422	1,33,215	340	312	652
		T	**2,34,833**	**2,31,303**	**4,66,136**	**78,231**	**77,874**	**1,56,105**	**952**	**766**	**1,718**
8	Ulundurpettai	U	11,960	11,774	23,734	2,421	2,271	4,692	10	15	25
		R	1,76,624	1,73,263	3,49,887	58,368	57,067	1,15,435	273	292	565
		T	**1,88,584**	**1,85,037**	**3,73,621**	**60,789**	**59,338**	**1,20,127**	**283**	**307**	**590**
	Total		**17,40,819**	**17,18,054**	**34,58,873**	**5,10,869**	**5,04,847**	**10,15,716**	**37,570**	**37,289**	**74,859**

Source : Website of Villupuram district http://www.Villupuram.tn.nic.in/

It could be observed from the Table 2.4 the SC population accounts for about 29 per cent and ST population accounts for about 2 per cent of the total population in the district. As per the latest census data, the SC/ST population in Villupuram District is about 10.9 lakhs forming 31.5 per cent of the population of the district. Thus, there is a very good scope for voluntary agencies to play a major role for the upliftment of the downtrodden.

Table 2.5 Literacy level statistics of Villupuram district population

Sl.No.	Components	Male	Female	Total	Percentage
1	Total Population	1740819	1718054	3458873	100.00
	Rural	1481475	1458310	2939785	84.99
	Urban	259344	259744	519088	15.01
2	Literates				
	Total Literates	1234479	961297	2195776	63.48
	Rural	1025617	778326	1803943	61.36
	Urban	208862	182971	391833	75.48

Source: Website of Villupuram district http://www.Villupuram.tn.nic.in/

It is vivid from the Table 2.5 that Villupuram district has 21,95,776 literate population of which 12,34,479 male population accounted for 56 per cent and 9,61,297 female population accounted for 44 per cent of the literacy rates. The total rural literate population is 82 per cent and the remaining 18 per cent is urban population.

2.4.2 Literacy level

School education facilities are available in this district through 1777 primary schools (including nursery schools) 311 Middle schools, 150 High Schools and 100 Higher Secondary Schools. Regarding higher education, Arts Colleges, Engineering Colleges, Medical College, Polytechnics, Industrial Training Institutes and Teacher Training Institutes are available in this district. The Government has run hostels for boys and girls for SC., ST., MBC and Backward classes.

2.4.3 Working population

The main occupation of the people in the district is agriculture. More than 86 per cent of the main workers in the district are engaged in agriculture. The main working population of the district is over 12 lakhs which constitutes 46.5 per cent of the district's population. The non-working category constitutes around 50 per cent of the total workers, which indicates that good potential exists for tapping unskilled labour force. Out of the total main workers male workers take nearly 70 per cent share. The occupational pattern is given in the Table 2.6.

Table 2.6 Occupational distribution of Villupuram district

Category of workers	Total	Percentage of population in lakhs
Total main workers	12.84	46.59
Cultivators	4.50	16.33
Agricultural labourers	5.13	18.63
Household workers	2.54	9.23
Other workers	0.66	2.39
Marginal workers	1.09	3.90
Total workers	13.91	50.49
Non workers	13.64	49.51

Source: Agro Stat - 2010

2.5 Soils and Topography

The soil types found in the district are red, black cotton and costal sand. Alkaline and saline patches are also spotted in the South-West and eastern parts of the district. The topography is almost plain in major areas. The Kalrayan hills and Gingee hills are with undulated terrain. The details on the types of soil and the places in which they found are given below in Table 2.7.

Table 2.7 Soil types and Places of Occurrence in Villupuram District

Sl.No.	Type of Soil	Places
1	Red soil	Ulundurpet, Vanur, Gingee, Tindivanam
2	Black soil	Kallakurichi, Chinnasalem
3	Red sandy soil	Kanai, Thiruvennainallur

Source: http://www.Villupuram.tn.nic.in (2011)

The soil map of this district is depicted in the Fig. 4

Soil legend

Legend

- DEEP, COARSE LOAMY, MIXED, ENTISOLS
- DEEP, COARSE LOAMY, MIXED, INCEPTISOL
- DEEP, COARSE LOAMY, MIXED, ULTISOLS
- DEEP, CONTRASTING PARTICLE SIZE, MIXED, INCEPTISOL
- DEEP, FINE LOAMY, MIXED, ALFISOLS
- DEEP, FINE LOAMY, MIXED, INCEPTISOL
- DEEP, FINE LOAMY, MIXED, ULTISOLS
- DEEP, FINE SILTY, MIXED, INCEPTISOL
- DEEP, FINE, MIXED, ALFISOLS
- DEEP, FINE, MIXED, INCEPTISOL
- DEEP, FINE, MIXED, MOLLISOLS
- DEEP, FINE, MONTMORILLONITIC, INCEPTISOL
- DEEP, FINE, MONTMORILLONITIC, VERTISOLS
- DEEP, SANDY, MIXED, ENTISOLS
- MODERATELY DEEP, CLAYEY SKELETL, MIXED, ALFISOLS
- MODERATELY DEEP, COARSE LOAMY, MIXED, ENTISOLS
- MODERATELY DEEP, COARSE LOAMY, MIXED, INCEPTISOL
- MODERATELY DEEP, FINE LOAMY, MIXED, ALFISOLS
- MODERATELY DEEP, FINE LOAMY, MIXED, INCEPTISOL
- MODERATELY DEEP, FINE, MIXED, ALFISOLS
- MODERATELY DEEP, FINE, MIXED, INCEPTISOL
- MODERATELY DEEP, FINE, MONTMORILLONITIC, INCEPTISOL
- MODERATELY DEEP, LOAMY SKELETL, MIXED, INCEPTISOL
- MODERATELY DEEP, VERY FINE, MONTMORILLONITIC, VERTISOLS
- MODERATELY SHALLOW, CLAYEY SKELETL, MIXED, INCEPTISOL
- MODERATELY SHALLOW, COARSE LOAMY, MIXED, ENTISOLS
- MODERATELY SHALLOW, FINE LOAMY, MIXED, ALFISOLS
- MODERATELY SHALLOW, FINE LOAMY, MIXED, INCEPTISOL
- MODERATELY SHALLOW, FINE, MIXED, ALFISOLS
- MODERATELY SHALLOW, FINE, MIXED, INCEPTISOL
- MODERATELY SHALLOW, FINE, MONTMORILLONITIC, INCEPTISOI
- MODERATELY SHALLOW, LOAMY SKELETL, MIXED, ENTISOLS
- SHALLOW, CLAYEY SKELETL, MIXED, ALFISOLS
- SHALLOW, CLAYEY SKELETL, MIXED, INCEPTISOL
- SHALLOW, CLAYEY, MIXED, ALFISOLS
- SHALLOW, CLAYEY, MIXED, ENTISOLS
- SHALLOW, CLAYEY, MIXED, INCEPTISOL
- SHALLOW, LOAMY SKELETL, MIXED, ALFISOLS
- SHALLOW, LOAMY SKELETL, MIXED, ENTISOLS
- SHALLOW, LOAMY SKELETL, MIXED, INCEPTISOL
- SHALLOW, LOAMY, MIXED, ALFISOLS
- SHALLOW, LOAMY, MIXED, INCEPTISOL
- VERY DEEP, CLAYEY SKELETL, KAOLINITIC, ALFISOLS
- VERY DEEP, COARSE LOAMY, MIXED, ENTISOLS
- VERY DEEP, COARSE LOAMY, MIXED, INCEPTISOL
- VERY DEEP, FINE LOAMY, MIXED, ALFISOLS
- VERY DEEP, FINE LOAMY, MIXED, INCEPTISOL
- VERY DEEP, FINE LOAMY, MIXED, ULTISOLS
- VERY DEEP, FINE SILTY, MIXED, ENTISOLS
- VERY DEEP, FINE, MIXED, ALFISOLS
- VERY DEEP, FINE, MONTMORILLONITIC, VERTISOLS
- Very SHALLOW, LOAMY SKELETL, MIXED, INCEPTISOL
- Very SHALLOW, LOAMY, MIXED, ENTISOLS
- WATERBODY / SETTLEMENT / MISCELLANEOUS LANDFORM

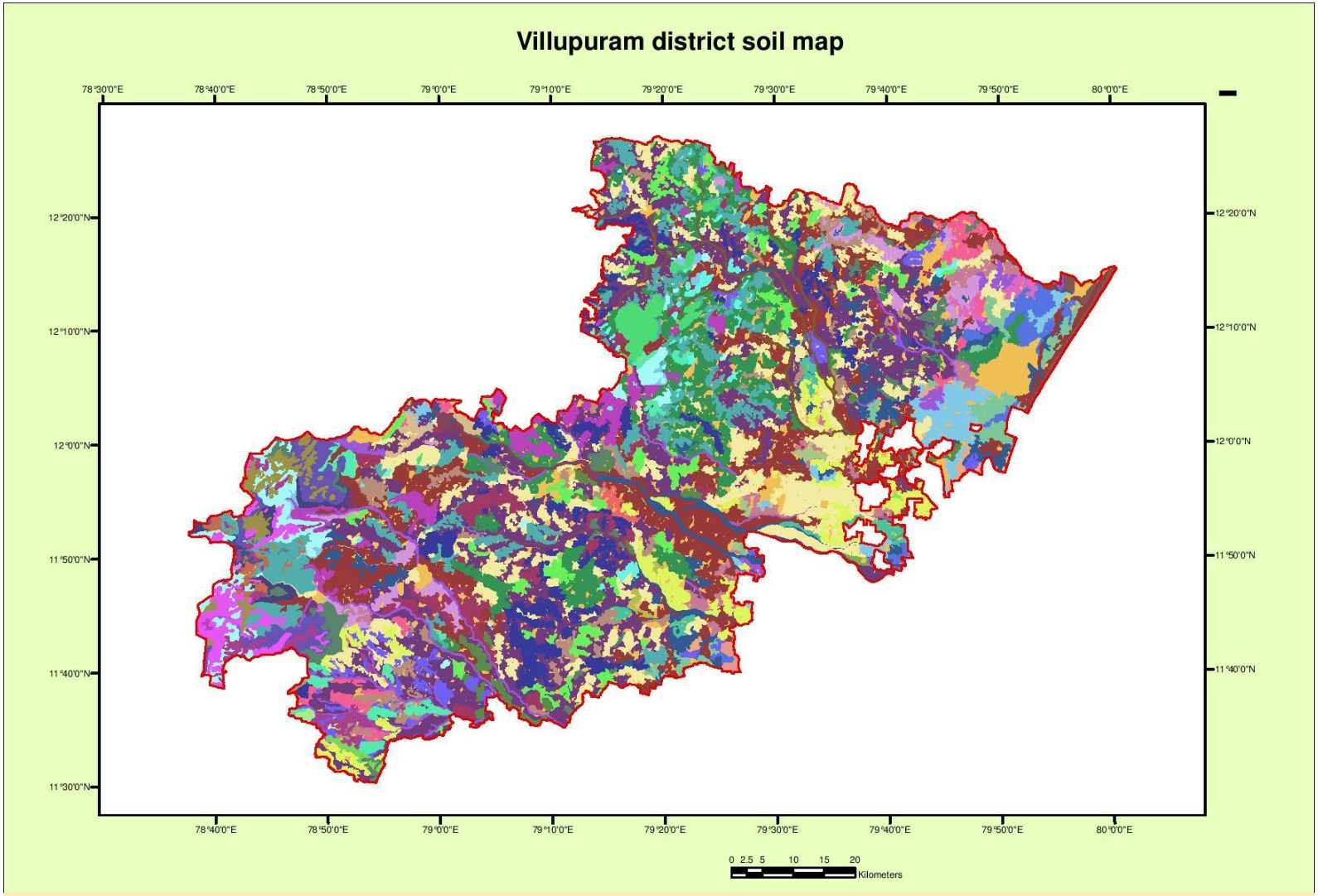

Fig. 4 Soil map of Villupuram district

2.6 Climatic Condition and Rainfall

It is observed from the Table 2.8 that the average rainfall of the district during 2014-15 is 992.7 cm which is lower than normal rainfall. The rainfall is heavier in the coastal area compared to interior areas. The rainfall details for Villupuram district are presented below in Table 2.8.

Table 2.8 Month wise / Season wise Rainfall Distribution in Villupuram district

Season / Month	2014-15	
	Actual (mm)	Normal (mm)
South West Monsoon		
June	91.1	45.9
July	48.4	83.9
August	160.1	130.2
September	120.5	145.3
Total	**420.1(42.319)**	**405.3**
North East Monsoon		
October	218.6	186.5
November	121.6	195.1
December	73.7	117.5
Total	**413.9(41.694)**	**499.1**
Winter Season		
January	3	18.5
February	0	9.7
Total	**3(0.3022)**	**28.2**
Hot Weather Season		
March	0	9.3
April	87.6	16.3
May	68.1	50.4
Total	**155.7(15.684)**	**76**
Annual rainfall	**992.7(100)**	**1011.66**

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

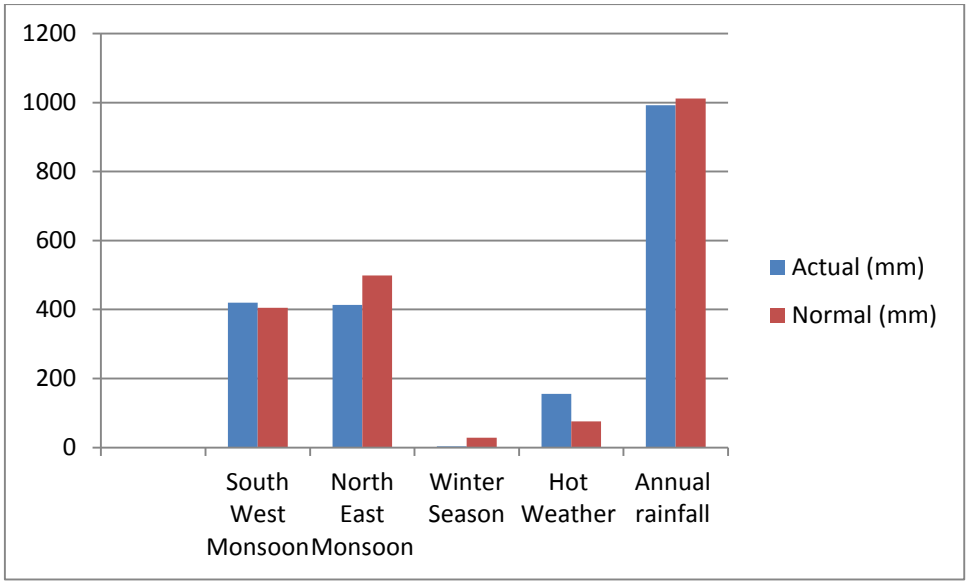

Fig.5. Average rainfall of Villupuram District

2.7 Land

2.7.1 Land Use pattern

The land utilization pattern indicates the way in which the land is put under various uses. The details regarding land use pattern of Villupuram district is given below in Table 2.9.

Table 2.9 Land Use Pattern of Villupuram District in 2014-15 (ha)

Sl.No	Classification	Area (ha)	% Share to Total Geographical area
1	Geographical Area	722203	100.00
2	Forest	71697	9.93
3	Barren & Uncultivable Area	56651	7.84
4	Land Put to Non-agricultural Uses	136115	18.85
5	Permanent Pastures & Other grazing lands	4170	0.58
6	Misc.tree crops & groves not incl. in the net area sown	6297	0.87
7	Current Fallow	84064	11.64
8	Other Fallow	16013	2.22
9	Net area sown	337606	46.75
10	Area sown more than once	137647	
11	Gross area sown	475253	

Source: Season and Crop Report of Tamil Nadu, 2014-15.

The total geographical area of the Villupuram district is 7, 22, 203 ha, of which, the net area sown is 3, 37,606 ha (45.79%) Whereas, forest covers 9.93% of the total area followed by land put into non-agricultural purpose is 18.85%.The current fallows are 84,064 ha

(11.64%) of the total area and this would reveal that an investment on land reclamation, strengthening of irrigation facilities and so on would facilitate the increase in net sown area.

2.7.2 Land holdings pattern

The details of land size classification and the number of land holdings are given below in Table 2.10.

Table 2.10 Agriculture land holdings and area of Villupuram District in 2011

Sl. No.	Size of the land holders	Land holding		Area of land holding	
		No.	Percentage	Hectare	Percentage
1	Less than one hectare (Marginal)	4,05,582	75.98	1,42,257	32.88
2	1 to 2 hectare (Small)	80,005	14.99	1,12,107	25.92
3	Above 2 hectare (Medium)	48,231	9.03	1,78,212	41.20
Total		**5,33,818**	**100.00**	**4,32,576**	**100.00**

Source: Office of Joint Directorate of Agriculture, Villupuram, 2011.

It is clear that 76 per cent of the land holdings are less than one hectare of land, 15 per cent of them own 1 to 2 hectares of land and only 9 per cent of the land holders own more than 2 hectares of land. On the other hand, it could be observed that about 33 per cent of land area is operated by marginal farmers, while the medium farmers operate 41 per cent of the land area indicating the skewed distribution of land area.

2.8 Sources of Irrigation

As the rivers in the district are not perennial, the major sources of irrigation are tube wells and open dug wells. The net area in the district is 3.17 lakhs hectares which forms 44% of the total area of the district and 32.78% of the net cultivated area. River irrigation account for less than 5% of the total irrigated area and the district is largely dependent on ground water and tanks. The major sources of irrigation and extent of coverage are given below in the Table 2.11.

Table 2.11 Area under different sources of irrigation in Villupuram District (in ha)

Source of Irrigation		2012-13	2013-14	2014-15	Average
Canals	Gross	1993	1610	1207	1603.33
	Net	1990	1517	1187	1564.67
Tanks	Gross	52559	47155	37067	45593.67
	Net	51318	43546	34103	42989.00
Tube wells / Bore wells	Gross	45823	61058	64540	57140.33
	Net	42102	48192	50680	46991.33
Open wells	Gross	143059	249158	248099	213438.67
	Net	132264	145615	157859	145246.00
Supplementary wells	Gross	4	0	0	1.33
	Net	4	0	0	1.33
Other Sources	Gross	0	0	0	0.00
	Net	0	0	0	0.00

Source: Season and crop report, 2014-15

2.8.1 Dams and reservoirs

Veedur and Komugi reservoirs are located in this district with the catchment area of 1298 ha and 292.67 ha respectively. Water from these reservoirs is used for irrigation purposes only in this district. The major details are given in the Table 2.12.

Table 2.12 Details of Dams/Reservoirs catchment area

Reservoirs	Catchment Area (in hec.)	Height (in ft)	Capacity (in mcft)	Length of Canal (in km)
Veedur Dam	1298	32	605	17.640
Komugi	292.67	46	560	23.248
Manimutha Dam	185.89	36	736.96	20.673

Source: Season and crop report, 2014-15

2.8.2 Ground water potential

As all the rivers are not perennial, greater dependence on ground water is noticed in the district. The block wise details of groundwater potential of the district are presented in Table 2.13.

Table 2.13 Distribution of Blocks according to Ground Water Potential

Dark Blocks	Grey blocks (Between 65% to 85% utilization)	White Blocks (Below 65% utilization)
Gingee	Mailam	Chinnasalem
Kandamangalam	Marakkanam	Kallakurichi
Koliyanur	Melmalayanur	Kalrayan Hills
T.V. Nallur	Olakkur	Kanai
Thirunavalur		Mugaiyur
Ulundurpet		Rishivandhiyam
Vallam		Sankarapuram
Vikaravandi		Thiyagadurgam
		Thirukoilur
		Vanur

Out of the 22 Blocks of the District, 12 Blocks are falling under the category of Grey/dark while remaining 10 Blocks are falling under white category.

2.9 Cropping pattern

2.9.1 Major crops grown

Cereals, pulses and oil seeds are observed to be the three important crops produced in the district. The productivity pattern indicates that the productivity of cereals and oil seeds has fluctuated and of pulses has increased over the 15 years. The area under production for cereals and oil seeds has fluctuated in the years upto 2014-15, but the area under production for pulses has steadily increased for the same period.

2.9.2 Area production and Productivity of major crops

Table 2.14 Area, production and Productivity of major crops (2014-15)

Sl.No	Particulars	Area (in ha)	Production (in tonnes)	Productivity (in kg/ha)
1	Paddy	171478.00	832585.00	4855
2	Maize	21176	162702	7683
3	Cholam	824.00	1711	2077
4	Cumbu	173.98	48087	2794
5	Ragi	4602.24	18769	4078
6	Bengal Gram	2.33	0.67	379.33
7	Red Gram	2599	3264	1003.33
8	Black Gram	62565.67	72191	861.67
9	Green Gram	2785.22	1985	560.00
10	Horse Gram	302.00	180.00	594.67
11	Groundnut	33199.00	114771.00	2125.00
12	Sunflower	114.00	213	1110.67

Sl.No	Particulars	Area (in ha)	Production (in tonnes)	Productivity (in kg/ha)
13	Gingelly	8553..00	5170.33	561.33
14	Castor	130.00	88.33	454.00
15	Cotton	9885.00	25640	275.33
16	Coconut	173.00	178.67	6869.67
17	Sugarcane	79709.00	9368212	79.00
18	Tobacco	14237.00	476800	550.33
19	Onion	170	1451	9073.67
20	Brinjal	346	3078	9034.00
21	Bhendi	194.33	1425.67	7361.33
22	Tomato	22.00	318.00	13678.67
23	Banana	881.00	35861	39706.00
24	Mango	1819	11714	6823.00
25	Jack Fruit	31.00	394.33	12870.67
26	Guava	428.00	4108	5071.00
27	Grapes	0.11	4.67	4654.33
28	Chillies	242	352	702.67
29	Garlic	5.67	8.33	984.00
30	Coriander	3.67	2.67	409.67
31	Turmeric	2138	4590	2184.33
32	Tamarind	98.33	451	4505.00
33	Tapioca	12819.67	476800	30702.00
34	Sweet Potato	58.33	1217	16955.00
	Total	**423212.6**	**11674324**	**201626.7**

Source: Season and Crop Report (2013-14)

From the Table 2.14, it is found that paddy occupies the major area in the district of about 1,71,478 ha followed by which is the sugarcane which covers an area of about 79,709 ha. Other crops includes, ground nut (33,199 ha), black gram (62,565.67ha), maize (21,176 ha), cumbu (173.98 ha), tapioca (12,819 ha), and. The area of paddy and sugarcane is more or less constant over the years. Further, it is observed that the area under oilseed crops like groundnut, sunflower and castor has increased over the years.

2.10 Consumption of Chemical Fertilizers and Pesticides

The consumption pattern of the major fertilizers and plant protection chemicals are depicted in the Table 2.15.

Table 2.15 Consumption of Fertilizers and Chemicals (In Metric tonnes)

Sl.No.	Fertilizers	2004 – 05	2005 – 06	2006 – 07
1	Nitrogen	37,000	26,690	24,180
2	Phosphate	21,000	10,943	9,554
3	Potassium	18,000	13,809	6,899
4	Paddy Micro-Nutrients	54.500	55.300	54.750
5	Pulses Micro-Nutrients	0.600	0.400	0.800

Sl.No.	Fertilizers	2004 – 05	2005 – 06	2006 – 07
6	Oilseeds Micro-Nutrients	31.200	29.300	31.500
7	Azospirillum	1.920	1.897	2.400
8	Rhizobium	0.900	0.954	0.900
9	Phosphobacteria	1.200	1.362	1.000
	Plant Protection chemicals			
10	Dust (Metric Tonnes)	37.822	21.41	33.965
11	Liquid (Lit)	32,858	32,374	41,235
12	Bio-pesticides (Lit)	8,360	11,552	13,500
13	Powder (MT)	5.500	5.448	5.300

Source: Office of Joint Directorate of Agriculture, Villupuram

The usage of Nitrogen, phosphate and potash fertilizers consumption has decreased from 2004-05 to 2006-07, but, the use of micro nutrients and bio- fertilizers has increased. Regarding plant protection chemicals, the use of bio-pesticides has increased considerably.

2.11 Agricultural Engineering - Machineries and Implements

Agricultural implements and machineries in Villupuram District are given in Table 2.16.

Table 2.16 Agricultural machineries and implements in Villupuram District

Sl.No.	Item	Nos.
1	**Ploughs**	
	a) Wooden	12,307
	b) Iron (Soil Plough & Soil String	8,612
	c) Total	20,919
2	**Water Pumps for Irrigation**	
	a) Worked by Oil Engine	2,464
	b) Worked by Electric Power	8,456
	c) Total	10,920
3	Tractors	2,742
4	Sugarcane Crushers	526

Source: Agriculture Census 2005-2006.

2.12 Agricultural Marketing and Regulated Markets

There are 17 Regulated Markets functioning under the control of Villupuram Market Committee in Villupuram district, of which 13 markets are functioning in its own land and buildings. The first regulated market (RM) was opened during 1939 at Tindivanam and the last Regulated Market was opened during 1986 at Moongilthuraipattu. In Villupuram market committee, 18 crops have been notified. The annual transaction of agricultural produces ranges from 3.4 Lakhs Mts to 4.61 Lakhs Mts. The annual receipt of market fees ranges from ₹ 2.64 crores to ₹ 3.65 crores. The total value of the products transacted ranges from ₹ 226 crores to ₹ 324 crores per annum. Of the total production of paddy, 55 per cent is sold

out through the regulated markets and also cumbu 75 per cent, ragi 38 per cent, groundnut 16 per cent gingelly 15 per cent, cotton 31 per cent and pulses 20 per cent. At times Cotton from Perambalur is also sold in Villupuram Regulated market.

The district possesses various support services for agriculture and allied sectors.This includes fertilizers / pesticides outlet (65 nos), agro service centres (22 nos), soil testing centres (8), plantation nurseries (4 nos), farmers club (970 nos), Krishi Vigyan Kendra (1) and others include agriculture implements and farm machineries. There are 27 regulated markets, 6 marketing societies, 228 PACBs, 3 Farmers' Service Societies (FSS) and 5 Large Sized Adivasi Multipurpose Societies (LAMPS) functioning in the district providing marketing support.

Table 2.17 Infrastructure & Support services for Agriculture

Types	Numbers	Types	Numbers
Fertilizer/Seed/Pesticide Outlets	65	Agriculture pump sets	1,96,789
Total N/P/K consumption [MT]	72,609	Pump sets Energiesd	1,57,899
Certified seed supplied [Qtl]	-	Agro Service Centres	22
Pesticides consumed [Lts]	7,112	Soil Testing Centres	8
Agriculture Tractors	4,834	Plantation nurseries	4
Power Tillers	-	Farmer's Clubs	70
Threshers/Cutters	4,307	Krishi Vigyan Kendra	1

Source: http://www.Villupuram.tn.nic.in (2011)

2.13 Infrastructure and Linkage support

2.13.1 Agriculture Extension Centres

The Department of Agriculture is implementing various schemes through its extension centres *viz.,* 21 Main Centres, 27 Sub Centres, One Soil Testing Laboratory, one Fertilizer Testing Laboratory, 4 State Seed Farms, 4 Seed Processing Centres, one Seed Testing Laboratory, one Bio-control laboratory, one Oilseeds Research Station, one Krishi Vigyan Kendra, etc. The Department of Agriculture distributes certified seeds as per the approved 'seed replacement rate' through Agricultural Extension Centers (AEC)/ their depots and meets about 30% of the requirement. Rest is met by private dealers and farmers' exchange through seed village mechanism. Further, production of foundation seeds and distribution of certified seeds are done both by the Department of Agriculture and progressive farmers. Department of Seed Certification is involved in ensuring quality seed production.

Seed production programme is being taken up by farmers depending on the local needs as per the assessment and guidance of the Assistant Directors of Agriculture. The Agriculture/Horticulture department is organizing awareness camps and demonstrations

for the benefit of farmers involved in cultivation of crops like paddy, sugarcane, cashew, cotton and mongo. During April - May 2012, Agriculture Department conducted 'Uzhavar Peruvizhas' in 1420 Revenue villages of the district, to create awareness about various schemes and facilities available for farmers from various line departments and banks.

2.13.2 Uzhavar Sandhais

Uzhavar Sandhais are located in 10 places in the district for the vegetable farmers to sell their products directly to the consumer.

2.13.3 Seed Farms

There are four Government Seed Farms in the district located at Kakuppam, Iruvelapattu, Vadakanandal and Vanur. Seed processing capacity of two major processing centres at Iruvelapattu and Vadakanandal is 1000 tonnes each and the processing capacity of two minor processing centres at Kakuppam and Vanur is 300 tons each. Further, 180 licensed Seed dealers are selling seeds to the farmers in the district. 'Seed Village Scheme' aims to improve the quality of farmer seeds. Under this Scheme, foundation / certified seeds of paddy, oilseeds, and pulses are distributed with 50% subsidy to the farmers besides trainings. Agriculture Department has identified 10 villages for implementing Seed Village Scheme.

2.13.4 Soil and Moisture Conservation Works

Implementation of watershed projects are carried out under NWDPRA, DPAP, IWDP etc., About 8,254 ha is expected to bring about improvement in soil and moisture conservation / enrichment and likely to promote diversification of cropping pattern.

2.13.5 Other Support Services

Tamil Nadu Small Farmers' Agricultural Business Consortium (TNSFAC) has been formed with the main objective to link the small farmers to both technologies as well as market in association with private, corporate and co-operative sectors. Table 2.18 shows the infrastructure for development of allied activities.

Table 2.18 Infrastructure for development of Allied activities

Types	Numbers	Types	Numbers
Veterinary Hospitals	72	Animal Markets	2
Disease Diagnostic Centers	1	Milk Collection Centres	465
Artificial Insemination Centers	230	Fisherman Societies	44
Animal Breeding Farms	NA	Fish seed farms	33
Animal Husbandry Training Centers	NA	Fish Markets	NA
Improved Fodder Farms	641	Poultry hatcheries	NA
		Slaughter houses	2

Source: Office of Joint Directorate of Agriculture, Villupuram

Table 2.19 Length of Roads (in Kms) in Villupuram District

Sl.No.	Road	Length
1	Villupuram – Trichy (N.H.No:45)	72.900
2	Vilupuram – Chinnasalem (N.H.No: 66)	82.08
3	Vilupuram – Nagai (N.H.No: 45A)	16.122

Huge quantities of agricultural produces transacted through the various regulated markets in the district are transported within and outside the district mostly by roads. There are travelers and inspection bungalows and Guest Houses maintained by the Government Departments and municipalities.

2.14 Sericulture

Sericulture is being under taken in Addukam, Avalurpet, Manandal, Athipattu, Kolappalur, Kanai, Kedar, Olakkur, Melvalai, Sembiama Devi and Chinna salem. Department supplies disease free silkworm eggs to the farmers and provide training to them in mulberry cultivation and rearing of cocoons. Marketing of cocoon is not a problem since the Department itself purchases the entire cocoon and any cocoons remains could be taken to Kanakapura in Karnataka by the farmers. The Department has constructed a cold storage to keep the eggs. At present the eggs are procured from Trichy, Vaniyambody, Krishnagiri, Salem, Keelpennathur and Coimbatore. Self- Help Groups have been involved in this sector also. In the district around 100 farmers are engaged in Sericulture and about 800 acres are under mulberry cultivation. For sericulture development, there are three technical service centers at Gingee, Ulundurpet and Villupuram. Besides there are one Government reeling center and a cocoon market at Villupuram. Silk reeling facilities are to be developed in the district.

2.15 Animal husbandry and Dairy development

2.15.1 Livestock population

Livestock is an important asset of the farmers and it supplements the farm income to a considerable extent, particularly in small and marginal holdings. The particulars on cattle population are furnished in Table 2.20.

Table 2.20 Livestock Population of Villupuram District

Sl.No.	Particulars	Population (numbers)
1	Cattle	812035
2	Buffaloes	17714
3	Sheep	255610
4	Goats	449125
5	Horses and ponies	73
6	Donkeys	256
7	Camels	0
8	Pigs	17031
	Total Livestock	**1551844**
9	Elephants	0
10	Dogs	48016
11	Rabbits	4288
	Poultry	
12	Back yard Poultry	537025
13	Farm Poultry	1977307
	Total Poultry	**2514332**

Source: 19th livestock census, 2012

The district possesses all the livestock's for the supplement income. About 8.12 lakhs numbers of cattle's, 0.17 lakhs of buffaloes, 2.56 lakhs of sheep's, 4.49 lakhs of goats and 25.1 lakhs of poultry birds are present in the district. Thus sizable cattle and poultry population indicates the potentials for livestock development in the district.

2.16. Veterinary institutions and hospitals

Veterinary institutions and hospitals play an essential role in the provision of veterinary services in all the districts. These laboratories are the source of new knowledge, innovative ideas and improved technology for the surveillance, prevention and control of animal diseases. In addition, many laboratories provide diagnostic and other services. The number of institutions and hospitals in the district are given in the Table 2.21 The district holds 1 clinician centre, 7 hospitals, 65 dispensaries, 35 veterinary sub centres, 4 mobile units, 56 sub centres, 1 livestock farm and 1 ADIU.

Table 2.21 Veterinary institutions and sub - centres in the district (2010-11)

Sl.No.	Particulars	Quantity (in numbers)
1	Divisions	3
2	Panchayat unions	22
3	Polyclinics	0
4	Clinician centre	1
5	Hospitals	7
6	Dispensaries	65
7	Upgraded veterinary sub centres	35
8	Mobile units	4
9	Sub centres	56
10	ADIU	1
11	PDDI	0
12	Livestock Farms	1
13	Frozen Semen Production Stations	0
14	CBFD	0

Source: Animal Husbandry - Statistical Handbook (2011)

2.17. Dairy development

Dairy is a universal agricultural production. It is a vital part of the global food system and it plays a key role in the sustainability of rural areas in particular. It is a well-known fact that the dairy industry actively contributes to the economies of a number of communities, regions and countries. The district produces 284.861 tonnes of cow's milk in which 77.301 tonnes are produced from indigenous breeds and 207.560 tonnes from exotic and cross breeds. The milk from buffalo is about 12.235 tonnes (Table 2.22).

Table 2.22 Milk production in the district (2010-11)

Sl.No.	Particulars	Quantity (in Tonnes)
1	**Cow's Milk** Indigenous Exotic & Cross breed	**284.861** 77.301 207.560
2	**Buffalo**	12.235
	Total (in Tonnes)	297.096

Source: Animal Husbandry - Statistical Handbook (2011)

Table 2.23 Particulars on dairy related institutes in the district

Sl.No.	Details	Nos.
1	No. of Dairy	1
2	Milk Producer Co-op. Society	646
3	Flush Season	373.14
4	Lean Season	279.75
5	Milk Chilling Plants	2

From the above Table 2.23 it could be inferred that there are 646 Milk Producer Co-operative Societies and 2 Milk Chilling Plants are available in the district.

2.18 Poultry development

Poultry rearing is secondary agriculture activities are being done in the district. The backyard poultry is about 10,56,254 numbers and farm poultry is 14,65,585 numbers. As a whole the district has 25,21,839 numbers of birds from all the blocks (Table 2.24).

Table 2.24 Poultry population in the district (2011)

Sl.No.	Poultry	Population (In nos.)
1	Backyard poultry	10,56,254
2	Farm poultry	14,65,585
	Total poultry	**25,21,839**

Source: Animal Husbandry – Statistical Handbook (2011)

2.19. Egg production

The egg production is an important activity in the district. The district produced 171.570 lakhs tonnes of desi eggs. The eggs of improved breeds were not produced. The details are given in the Table 2.25.

Table 2.25 Egg production in the district (2010-11)

District	Desi (in lakhs tonnes)	Improved (in lakhs tonnes)	Total (in lakhs tonnes)
Villupuram	171.570	0.00	**171.570**

Source: Animal Husbandry – Statistical Handbook (2011)

2.20. Fisheries

Villupuram district has a coastal line of 30 Kms. Inland fresh water area spreads about 83,014 hectares and estuaries & brackish water area is 2,072 hectares. Marine fishing is practiced in 20 coastal villages of the district. The fish production has increased both in quantity and values. There has been no fish seed production of standard fry. Fish productions in both inland and coastal have steadily increased in the district. There are about 19 fishermen co-operative societies covering 20 villages in Viluppuram District. The fishermen population is estimated at 13,998 in the district.

2.21. Industries

The Villupuram District is one of the industrially backward districts of Tamil Nadu. The names of industries and number of units functioning in the district are listed in Table 2.26.

Table 2.26 Industries in Villupuram District

Name of the Industry	No of Units
Food Industries	2,191
Cotton Textiles	91
Hosiery and Garments	1,618
Wood Products	195
Paper products and printing	2
Leather products	95
Rubber and Plastic products	119
Chemicals and Chemical products	7
Non-Metallic Mineral products	92
Basic Metal Industry	1
Metal Products	339
Machinery parts	572
Electrical Machinery and Apparatus	78
Transport Equipment's and Parts	2
Miscellaneous Manufacturing Industries	104
Real Estate and Business Services	39
Personal Services	96
Repair Services	263
Service not classified	4
Sugar Mills	4
Total	**6,472**

Source: http://www.Villupuram.tn.nic.in (2011)

The district has four sugar mills of which, three are in the co-operative sector and one in private sector. It has a spinning mill, two cotton textile mills, few shoe making units, few sago units, granite units, crusher units, a few edible oil mills, a number of modern rice mills, two paper pulp units, two mineral water units etc. Other than these, there is no major industrial unit in the district. Nearness to Pondicherry offers good scope for development of ancillary units in the district. Further, the district offers good scope for setting up of agro - processing units.

Table 2.27 Agro – Processing Units in Villupuram District

Types of Processing Activity	No. of units
Food (Rice/Flour/Dal/Oil/Tea/Coffee)	444
Sugarcane(Gur/ Khandasri /Sugar)	7
Fruit (Pulp/Juice/Fruit drink)	1
Spices (Masala Powder / Pastes)	NA
Dry- fruit (Cashew/Almond/Raisins)	NA
Cotton (Ginning/Spinning/Weaving)	28
Milk (Chilling/Cooling/Processing)	2
Meat (Chicken/Mutton/Pork/Dry fish)	2
Animal feed (Cattle/ Poultry /Fishmeal)	1

Source: Office of Joint Directorate of Agriculture, Villupuram 2008.

The agro processing units in the district are given in the Table 2.27. The district possesses 28 ginning or spinning units, 1 pulping industry, 7 sugarcane processing industries, 444 food industries, I animal feed industry, 2 meat industry and 2 milk processing industries.

2.22. Industrial Climate

There are 21 large and medium scale units in the district; majority of them are located in Viluppuram, Tindivanam and Kallakurichi Taluks. There is no industrial estate in the district. Only tiny match sheds constructed by SIDCO are located at Kallakurichi – 55 sheds. Thiagadurgam – 22 sheds and Tirukoilur – 10 sheds. The following proposals are at various level for starting industrial estates in the district.

- Viluppuram District Small Scale Industries Association is putting up an industrial estate at Janakipuram near Viluppuram to the extent of 15.23 acres with 50 developed plots.
- There is a proposal to put up an industrial estate at Ulundurpet in about 200 acres by SIDCO exclusively for the benefit of SC/ST entrepreneurs.
- SIDCO has already acquired nearly 45 acres at Venmaniathu in Tindivanam Taluk to put up an industrial estate and the plots are yet to be developed and allotted to needy entrepreneurs.
- There is a proposal to put up SIPCOT complex at Vikaravandi in about 600 acres. This has been deferred by the government at present. The District Administration has taken up to the matter with the Government for setting up the Industrial complex.

  There are about 6,468 registered SSI units in the district as on 31 March 1999.

2.23. Communication

Post offices are the vital means for communicating written information, sending messages to the needed destinations. Telephones are the essential means for oral communication and are the easiest way of transferring the messages. The number of post offices and telephone exchanges are presented in the Table 2.28 below.

Table.2.28 Postal and Telegraph Offices

Sl.No.	Subject	Details
1	Telephones in Use	LL28687 WLL
2	Direct Exchange Lines	LL 28687 WLL
3	Post Office	329
4	Telephone Exchanges	96
5	Public Call Office (PPCO)	131
6	General CCBPCO	1,565

There are 329 post offices in the district. Totally 96 telephone exchanges and 28687 telephone lines are use in the district. There are 131 public call offices and 1565 General CCBPCO in the district.

CHAPTER III

DEVELOPMENT OF AGRICULTURE AND ALLIED SECTORS

The action plan for enhancing the agricultural production includes the following components:

- Trends in area, production and productivity of major crops
- Yield gap analysis
- Projection on yield and production by 2023
- Technological intervention
- Strengthening of input supply system
- Strengthening of infrastructural facilities

3.1. Trends in area, production and productivity of major crops

The past trends in area, production and productivity of major crops need to be analyzed to plan for future agricultural development. Compound Growth Rate (CGR) tool is used to measure the annual rate of growth in area, production and productivity of major crops cultivated in the district and it is expressed in percentage. The compound growth rate has been estimated using time series data from 2005-06 to 2014-15. The equation used to estimate the annual compound growth rate is: $Y_t = ab^t e$

Logarithmic form of the above equation is: ln Y =ln a + t ln b

The compound growth rate (CGR) in percentage is derived using the formula:

CGR(r) = [Antilog b-1] × 100

Where, Y_t = Area or Production or Yield

a = Intercept

b = Regression coefficient of t

t = Time variable

r = Compound Growth Rate

i) Area

The CGR of area, production and yield of major crops grown in Villupuram district are given in Table 3.1

Table 3.1 Compound Growth Rate of Area, Production and Productivity for Major Crops Grown in Villupuram District

Sl.No.	Crops	CGR during 2005-2006 to 2014-2015 (%)		
		Area	Production	Productivity
1	Paddy	-0.12	4.31	4.43
2	Cholam	-20.88	-15.92	6.27
3	Cumbu	0.39	14.24	13.87
4	Ragi	12.04	21.60	8.53
5	Total cereals	1.11	6.64	N.A
6	Blackgram	14.01	21.31	6.41
7	Redgram	13.66	16.52	2.55
8	Total pulses	13.05	20.90	N.A
9	Total food grains	2.96	-22.17	N.A
10	Chillies	0.51	-0.37	-0.85
11	Turmeric	3.03	-2.21	-5.09
12	Sugarcane	5.25	5.41	0.18
13	Tamarind	N.A	-7.51	-0.01
14	Sweet potato	N.A	-8.52	6.53
15	Banana	-2.41	-5.31	-2.97
16	Guava	-5.81	-17.90	-12.83
17	Lemon	-16.12	-20.84	-5.59
18	Tapioca	-1.19	-2.01	-0.83
19	Brinjal	2.38	6.32	3.85
20	Ladys finger	3.72	3.33	-0.65
21	Tomato	-0.05	0.71	0.80
22	Cashewnut	N.A	10.46	10.30
23	Cotton	N.A	8.42	N.A
24	Groundnut	-6.04	-0.79	4.75
25	Gingelly	-1.81	6.27	7.52
26	Coconut	-2.58	N.A	N.A
27	Sunflower	N.A	-28.93	-0.12

The gross cropped area of paddy, cholam, banana, guava, lemon, tapioca, tomato, groundnut, gingelly and coconut had showed a negative growth rate during the period from 2005-06 to 2014-15 (Table 3.1). This would indicate that intensive developmental efforts are needed at least to sustain the existing cropped area. However, the estimated compound growth rate of various crops grown in Villupuram District would reveal that crops like red gram, blackgram, turmeric, sugarcane, ladys finger and ragi, had a positive CGR of greater than one per cent per annum. The commercial / horticultural crops like fruits and vegetables are also to be covered under larger area.

Table 3.2 Area, Production and Productivity for major crops in Villupuram District (Triennium Average ending 2014-15)

Sl.No.	Crops	Area	%	Production	Yield (kg / ha)
1	Paddy	152504	17.74	675241	4320
2	Cholam	571	0.07	884	1448
3	Cumbu	13933	1.62	33098	2201
4	Ragi	3004	0.35	11005	3157
5	Total cereals	191415	22.27	848824	N.A
6	Blackgram	49002	5.70	48066	862
7	Redgram	1739	0.20	1926	1003
8	Total pulses	55166	6.42	52515	N.A
9	Total food grains	246580	28.68	520709	N.A
10	Chillies	239	0.03	172	703
11	Turmeric	2460	0.29	5370	2184
12	Sugarcane	82644	9.61	9557319	116
13	Tamarind	N.A	0.00	443	4505
14	Sweet potato	N.A	0.00	963	16955
15	Banana	1000	0.12	39516	39706
16	Guava	412	0.05	2123	5071
17	Lemon	26	0.00	46	1781
18	Tapioca	12820	1.49	394197	30702
19	Brinjal	253	0.03	2281	9034
20	Ladys finger	194	0.02	1426	7361
21	Tomato	16	0.00	212	13679
22	Cashewnut	N.A	0.00	2805	556
23	Cotton	N.A	0.00	21503	N.A
24	Groundnut	37573	4.37	114771	3031
25	Gingelly	6300	0.73	5170	765
26	Coconut	1773	0.21	N.A	N.A
27	Sunflower	N.A	0.00	186	1650
	Total	**859623**	**100.00**		

Source: Season and Crop Report of Tamil Nadu, 2014-15

Paddy, cumbu, ragi, blackgram, red gram, sugarcane, brinjal, lady's finger, cashewnut, cotton and gingelly were the major crops which had positive CGR in their production. The crops like cholam, banana, guava, lemon and chillies had negative growth rate in their production. As far as the productivity in Villupuram district were concerned, banana, guava, chillies, lemon, and lady'sfinger had a negative growth rate in their productivity. Therefore, planned efforts are required to reverse this trend.

3.2. Projected Area, Production and Yield of Selected Crops

For the identified potential crops in Villupuram district, area, production and yield were projected using CGR and the results are presented in Table 3.3

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

Crop	Paddy			Blackgram			Sugarcane		
	Area	Production	Yield	Area	Production	Yield	Area	Production	Yield
CGR	-2.6	-3.3	- 0.7	-3.4	-4.4	-1.0	-0.9	-0.2	0.7
Triennium Average ending 2010-11	82,134	2,74,123	3,338	4,899	2,176	468	6,171	6,64,717	107775
2012-13	77,956	2,56,369	3,289	4,567	1,990	459	6,066	6,62,716	1,09,309
2017-18	68,419	2,16,854	3,170	3,832	1,592	438	5,812	6,57,741	1,13,240
2022-23	60,048	1,83,430	3,055	3,215	1,273	418	5,568	6,52,803	1,17,312

Crop	Mango			Groundnut		
	Area	Production	Yield	Area	Production	Yield
CGR	4.2	2.9	-1.3	-7.6	-5.2	2.6
Triennium Average ending 2010-11	10,264	25,302	2,458	12,069	46,993	3,883
2012-13	11,144	26,785	2,396	10,310	42,274	4,089
2017-18	13,691	30,883	2,249	6,952	32,447	4,654
2022-23	16,820	35,609	2,111	4,688	24,905	5,297

Note: Area in Ha. Production in Tonnes and Yield in Kg per ha.

It is found from Table 3.3 that the area and production of the selected crops like paddy, black gram, and sugarcane and ground nut have been projected to decline in 2022-23 owing to their negative annual compound growth rates. The production of Cumbu alone has been projected to increase due to its positive growth rate. Further, the CGR of productivity of paddy, black gram and cumbu also have shown a marginal decline during the period. Nevertheless, the crops like paddy and black gram are important staple food crops; sugarcane provides raw material to sugar mill and it is important - high revenue yielding commercial crop to the farmers; cashew nut is an important Cash crop besides having high export value; and ground nut is an important edible oilseed crop. In view of all these reasons, planned efforts are essential to sustain their current area. Also, their production needs to be increased by way of enhancing their productivities.

3.3. Yield Gap Analysis

In order to raise the productivities of the selected crops, information regarding ruling varieties, their average yield, potential yield, progressive farmer's yield etc., were collected from the Office of the Joint Director of Agriculture, Villupuram and Krishi Vigyan Kendra, Tindivanam. Accordingly, yield gap were analyzed and presented in Table 3.4.

Table 3.4 Yield Gap of the Identified Potential Crops in Villupuram District

Yield Gap Analysis						
Crops (Kg/ac)	**Potential Yield (A)**	**Progressive Yield (B)**	**Avg. Yield (C)**	**Yield Gap-I (A-B)**	**Yield Gap-II (B-C)**	**Yield Gap-III (A-C)**
Paddy						
ADT 43	5,900	8,680	7,519	-2780	1,161	-1619
ADT 45	5,400	6,200	5,130	-800	1,070	270
ADT 36	4,000	7,917	5,524	-3917	2,393	-1524
ADT 37	6,200	8,109	7,640	-1909	469	-1440
White Ponni	4,500	5,400	4,850	-900	550	-350
ADT 39	5,000	6,300	5,200	-1300	1,100	-200
Black Gram						
VBN 3	900	1,050	930	-150	120	-30
VBN 4	900	1,025	910	-125	115	-10
VBN 5	820	970	860	-150	110	-40
Groundnut (Rainfed)						
TMV 7	1,100	1,350	1,230	-250	120	-130
TMVGn13	1,613	1,925	1,700	-312	225	-87
VRI 2	1,790	2,100	1,820	-310	280	-310
Groundnut (Irrigated)						
TMV 7	1,900	2,400	2,100	-500	300	-200
TMVGn13	2,580	2950	2,250	-370	700	-330
VRI 2	2,060	2,600	2,150	-540	500	-90

Yield Gap Analysis						
Crops (Kg/ac)	**Potential Yield (A)**	**Progressive Yield (B)**	**Avg. Yield (C)**	**Yield Gap-I (A-B)**	**Yield Gap-II (B-C)**	**Yield Gap-III (A-C)**
Sugarcane						
CO 86,032	1,10,000	1,83,200	1,07,897	-73,200	75,303	2,103
Cumbu						
TNAU Cumbu COH9 (Rainfed)	2,707	5,108	3,046	-2,401	2,062	-339
TNAU Cumbu COH9 – Irrigated	3,728	6,444	4,800	-2,716	1,644	-1,072

Yield Gap is the difference between the progressive farmer's yield and average farm yield which explains the gap due to soil and climatic factors, crop management factors, technologies available, cultivation practices etc.,

3.4. Projected Yield and Production of the Selected Crops

Using the secondary data on area, yield and production of the selected crops, *viz.*, paddy, black gram, sugarcane, mango and ground nut, the projected yield and production for these crops for the year 2022-23 were estimated and the results are discussed in the following section. The annual growth rate of areas for the period between 1993-94 and 2010-11 were negative for the selected major crops like paddy (-2.6 per cent), black gram (-3.4 per cent), sugarcane (-0.9 per cent) and ground nut (-7.6 per cent) and it was positive only in case of mango (4.2 per cent). Therefore, planned efforts are utmost necessary to sustain the areas under these crops so as to enhance the agricultural production by means of raising the productivities of these crops. The yield gaps for these selected crops were much wider ranging from 125 Kg in black gram to 7,320 Kg in sugarcane. Therefore, the best option for raising the production is to take efforts the bridge the existing yield gaps in a situation where the scope for increasing the area under the crops is limited. Moreover, as the Villupuram district is nearer to Chennai city, the existing cropped area is gradually being converted into non-agricultural purpose. Hence, it would be a great task even to sustain the existing net sown area of the district. However, efforts are required to sustain the present net sown area of the district, as this district has a very good location advantage of production and supply of food grains, vegetables, fruits, flowers, and other value – added agricultural commodities required to meet the growing demands of the population of the city.

In view of the above reasons, projection for raising the productivities of the selected crops alone was resorted to assess the estimated yield and production for the period from 2011-12 to 2022-23 and the results are discussed below.

i) Paddy

Sornavari is the major season for paddy in the district, which has 45 per cent of the total area under paddy followed by *Samba* (40 per cent) and *Navarai* (15 per cent). The maximum yield recorded in the crop cutting experiment was considered to assess the potential yield for paddy varieties viz., ADT45 and ADT 37 grown in *Sornavari* and *Navarai* seasons. However, Co (R) 49 is considered to be a substitute for BPT 5204 grown during Samba season, its average yield as given in Crop Production Guide, 2012, TNAU, Coimbatore has been considered to be its potential yield. These yield gaps in the three seasons could be gradually bridged over the next 12 year period, i.e., from 2011-12 to 2022-23 as indicated in Table 3.5. Extension machinery needs to be strengthened to bridge the yield gap so that the yield is raised annually at the rate of 5.15 per cent. The bridging up of the yield gap would result in the gradual increase in paddy production from 2.74 lakhs tonnes in 2010-11 to 5.04 lakhs tonnes in 2022-23 accounting for an increase of 84 per cent.

Table 3.5 Existing and Projected Yield and Production of Paddy in Villupuram District

Year	Season			Total
	Kar / Kuruvai / Sornavari (Apr-July)	Samba/ Thaladi/ Pishanam (Aug-Nov)	Navarai/ Kodai (Dec-Mar)	
Area (Ha)				
2008-09	39,812	31,119	11,309	82,240
2009-10	37,197	31,644	12,101	80,942
2010-11	33,201	35,714	14,304	83,219
Triennium average ending 2010-11**	36,737	32,826	12,571	82,134
Projected area for 2022-23	36,737	32,826	12,571	82,134
% to total	44.73	39.97	15.31	100.00
Varieties	ADT43 and ADT45	BPT 5204 ADT 49 and *Co (R) 49*	ADT 37	-
Maximum yield as per Crop Cutting Experiment (Kg/ha)	6,464	6286*	4,770	6,134

Table 3.5 Existing and Projected Yield and Production of Paddy in Villupuram District (Contd,.)

Year	Season			Total
	Kar / Kuruvai / Sornavari (Apr-July)	Samba/ Thaladi/ Pishanam (Aug-Nov)	Navarai/ Kodai (Dec-Mar)	
Average yield for Triennium average ending 2010-11 (Kg/ha)**	3,374	3,216	3,487	3,338
Yield Gap (Kg/ha)	3,090	3,070	1,283	2,796
Projected Production for 2022-23 (tonnes)*	2,37,466	2,06,342	59,965	5,03,773
Production for Triennium average ending 2010-11 (tonnes)**	1,25,185	1,05,127	43,811	2,74,123
Percentage of increase in production over 2010-11	89.69	96.28	36.87	83.78

**Based on Crop Production Guide.*

*** Source: Season and Crop Reports of 2008-09, 2009-10 and 2010-11.*

Table 3.6 Projected Increase in Yield and Production of Paddy from 2011-12 to 2022-23

Year	Yield (Kg per ha)				Production (Tonnes)			
	Kar / Kuruvai / Sornavari (Apr-July)	Samba/ Thaladi/ Pishanam (Aug-Nov)	Navarai/ Kodai (Dec-Mar)	Total	Kar / Kuruvai / Sornavari (Apr-July)	Samba/ Thaladi/ Pishanam (Aug-Nov)	Navarai/ Kodai (Dec-Mar)	Total
Triennium average ending 2010-11	3,374	3,216	3,487	3,338	1,25,185	1,05,127	43,811	2,74,123
2011-12	3,631	3,472	3,594	3,571	1,34,541	1,13,561	45,157	2,93,260
2012-13	3,889	3,728	3,701	3,804	1,43,898	1,21,996	46,504	3,12,398
2013-14	4,146	3,984	3,808	4,037	1,53,255	1,30,431	47,850	3,31,535
2014-15	4,404	4,240	3,915	4,270	1,62,612	1,38,865	49,196	3,50,673
2015-16	4,661	4,495	4,022	4,503	1,71,968	1,47,300	50,542	3,69,810
2016-17	4,919	4,751	4,129	4,736	1,81,325	1,55,734	51,888	3,88,948
2017-18	5,176	5,007	4,235	4,969	1,90,682	1,64,169	53,234	4,08,085
2018-19	5,434	5,263	4,342	5,202	2,00,039	1,72,604	54,581	4,27,223
2019-20	5,691	5,519	4,449	5,435	2,09,396	1,81,038	55,927	4,46,361
2020-21	5,949	5,774	4,556	5,668	2,18,752	1,89,473	57,273	4,65,498
2021-22	6,206	6,030	4,663	5,901	2,28,109	1,97,908	58,619	4,84,636

Table 3.6 Projected Increase in Yield and Production of Paddy from 2011-12 to 2022-23 (Contd,.)

Year	Yield (Kg per ha)				Production (Tonnes)			
	Kar / Kuruvai / Sornavari (Apr-July)	Samba/ Taladi/ Pishanam (Aug-Nov)	Navarai/ Kodai (Dec-Mar)	Total	Kar / Kuruvai / Sornavari (Apr-July)	Samba/ Thaladi/ Pishanam (Aug-Nov)	Navarai/ Kodai (Dec-Mar)	Total
2022-23	6,464	6,286	4,770	6,134	2,37,466	2,06,342	59,965	5,03,773
Required Growth Rate (%)	**5.51**	**5.68**	**2.64**	**5.15**	**5.42**	**5.71**	**2.64**	**5.15**

The annual growth rate required raising the yield and production of paddy in 2022-23 is approximately 5.51 and 5.15 per cent per annum respectively as indicated in Table 3.6.

ii) Black gram

Black gram is a major pulse crop grown in *Rabi* season accounting for 93 per cent of the total area. Major varieties grown are Vamban 3, Vamban 4 and Vamban 5.

Table 3.7 Existing and Projected Yield and Production of Blackgram

Year	Season		
	Kharif	Rabi	Total
Area (Ha)			
2008-09	268	2,984	3,252
2009-10	339	2,672	3,011
2010-11	512	7,921	8,433
Triennium average ending 2010-11**	373	4,526	4,899
Projected area for 2022-23	373	4,526	4,899
% to total	7.61	92.39	100.00
Varieties	Vamban 3	Vamban 3	
Maximum Potential yield (Kg/Ha)*	750	750	750
Average yield for Triennium average ending 2010-11 (Kg/Ha)**	-	-	468
Yield Gap (Kg/Ha)	-	-	282
Projected Production for 2022-23 (tonnes)	-	-	3,674
Production for Triennium average ending 2010-11 (tonnes)**	-	-	2,176
Percentage of increase in production over 2010-11	-	-	68.84

** Based on Crop Production Guide.*

*** Source: Season and Crop Reports of 2008-09, 2009-10 and 2010-11.*

Table 3.7 indicates that the required annual growth rate in the productivity of black gram during 2011-12 to 2022-23 is four per cent. In an effort of bridging the yield gap, the production could be raised from 2176 tonnes (2010-11) to 3674 tonnes (2022-23) accounting for an increase of 69 per cent.

Table 3.8 Projected Increase in Yield and Production of Black gram from 2011 -2012 to 2022-2023 in Villupuram District

Year	Yield (Both Irrigated and Rainfed) (Kg per ha)	Production (Both Irrigated and Rainfed) (Tonnes)
Triennium average ending 2010-11	468	2,176
2011-12	492	2,301
2012-13	515	2,426
2013-14	539	2,551
2014-15	562	2,675
2015-16	586	2,800
2016-17	609	2,925
2017-18	633	3,050
2018-19	656	3,175
2019-20	680	3,300
2020-21	703	3,424
2021-22	727	3,549
2022-23	750	3,674
Required Growth Rate (%)	**3.99**	**4.43**

The annual growth rate required toraise the yield and production of black gram in 2022-23 is approximately 3.99 and 4.43 per cent per annum respectively as indicated in Table 3.8.

Sugarcane

In Villupuram district, sugarcane is grown in an area of 6171 ha and the canes are supplied to the sugar mills. Ratoon crop accounts for a larger area of 63 per cent. Major varieties grown in the district are CoC 86071 and CoC 86032. The yield gap estimated was only 20.5 tonnes ha and this gap could be bridged as indicated in Table 3.9. The annual growth rate required to raise the yield from 108 tonnes per ha in 2010-11 to 128.5 tonnes per ha in 2022-23 is estimated at 1.46 per cent. The increase in production is bridging this yield gap, from 6.6 lakhs tonnes (2010-11) to 7.9 lakhs tonnes (2022-23) accounts for 19 per cent.

Table 3.9 Existing and Projected Yield and Production of Sugarcane in Villupuram District

Year	Season		
	Planted	Ratoon	Total
Area (Ha)			
2008-09	2,060	3,555	5,615
2009-10	2,338	3,862	6,200
2010-11	2,445	4,253	6,698
Triennium average ending 2010-11*	2,281	3,890	6,171
Projected area for 2022-23	2,281	3,890	6,171
% to total	36.96	63.04	100.00
Varieties	COC 86071 and CoC 86032	COC 86071 and CoC 86032	
Maximum potential yield (tonnes/ha)	128.5	128.5	128.5
Average yield for Triennium average ending 2010-11 (tonnes/Ha)*	108.0	108.0	108.0
Yield Gap (tonnes/Ha)	20.5	20.5	20.5
Projected Production for 2022-23 (tonnes)	-	-	7,92,974
Production for Triennium average ending 2010-11 (tonnes)*	-	-	6,64,717
Percentage of increase in production over 2010-11	-	-	19.29

* *Source: Season and Crop Reports of 2008-09, 2009-10 and 2010-11.*

Table 3.10 Projected Increase in Yield and Production of Sugarcane from 2011- 2012 to 2022-2023 in Villupuram District

Year	Yield (tonnes per ha)	Production (Tonnes)
Triennium average ending 2010-11	108	6,64,717
2011-12	110	6,75,405
2012-13	111	6,86,093
2013-14	113	6,96,781
2014-15	115	7,07,469
2015-16	117	7,18,157
2016-17	118	7,28,846
2017-18	120	7,39,534
2018-19	122	7,50,222
2019-20	123	7,60,910
2020-21	125	7,71,598
2021-22	127	7,82,286
2022-23	129	7,92,974
Required Growth Rate (%)	**1.46**	**1.48**

The annual growth rate required to raise the yield and production of sugar cane in 2022-23 is approximately 1.46 and 1.48 per cent per annum respectively as indicated in Table 3.10.

iii) Mango

Mango is the major fruit crop grown in Villupuram district with an area of 10,264 ha. Implementation of Area Expansion Schemes with High Density Planting method, Rejuvenation and Gap – filling with preferred variety and chemical spraying and other precautionary methods to prevent flower dropping would improve the yield potential of Mango.

The required annual growth rate for enhancing the yield from 2458 Kg / ha (2010-11) to 7510 Kg/ ha (2022-23) is estimated at 9.45 percent (Table 3.12). After bridging the yield gap, Mango production will increase from 25,302 tonnes (2010-11) to 77,080 tonnes (2022-23) accounts for 20.4 per cent.

Table 3.11 Existing and Projected Yield and Production of Mango in Villupuram District

Year	Season		
	Irrigated	Unirrigated	Total
Area (Ha)			
2008-09	5,025	5,044	10,069
2009-10	3,941	6,258	10,199
2010-11	2,843	7,680	10,523
Triennium average ending 2010-11*	3,936	6,327	10,264
Projected area for 2022-23	3,936	6,327	10,264
% to total	38.35	61.65	100.00
Varieties	Banganapalli	Banganapalli	
Maximum yield as per Crop Cutting Experiment (Kg/ha)	7,510	7,510	7,510
Average yield for Triennium average ending 2010-11 (Kg/ha)*	-	-	2,458
Yield Gap (Kg/ha)	-	-	5,052
Projected Production for 2022-23 (tonnes)	-	-	77,080
Production for Triennium average ending 2010-11 (tonnes)*	-	-	25,302
Percentage of increase in production over 2010-11	-	-	204.64

** Source: Season and Crop Reports of 2008-09, 2009-10 and 2010-11.*

Table 3.12 Projected increases in Yield and Production of Mango 2011- 2012 to 2022-2023 in Villupuram District

Year	Yield (Both Irrigated and Rainfed) (Kg per ha)	Production (Both Irrigated and Rainfed) (Tonnes)
Triennium average ending 2010-11	2,458	25,302
2011-12	2,879	29,617
2012-13	3,300	33,932
2013-14	3,721	38,247
2014-15	4,142	42,561
2015-16	4,563	46,876
2016-17	4,984	51,191
2017-18	5,405	55,506
2018-19	5,826	59,821
2019-20	6,247	64,136
2020-21	6,668	68,450
2021-22	7,089	72,765
2022-23	7,510	77,080
Required Growth Rate (%)	**9.45**	**9.42**

The annual growth rate required raise the yield and production of mango in 2022-23 is approximately 9.45 and 9.42 per cent per annum respectively as indicated in Table 3.12.

v) Groundnut

Groundnut is the major oilseed crop grown in Villupuram district and it is grown under irrigated as well as rainfed conditions. It is cultivated mostly in *Rabi* season accounting for 70 per cent of the total area under groundnut. Major varieties grown in the district are TMV 7, VRI 2, K6 and Pollachi Red Local. Of these varieties, K6 has a very yield potential of 4963 Kg per ha and it is suggested for bridging the yield gap. Selection of the suitable variety and timely application of inputs would improve the productivity. Improvement of the average yield during the next 12 – years period, i.e., from 2011-12 to 2022-23 and it results increase in the production are given in Table 3.13. After bridging the yield gap, the production could be increased from 38994 tonnes (2010-11) to 59900 tonnes (2022-23) accounting for an increase of 54 per cent.

Table 3.13 Existing and Projected Yield and Production of Groundnut in Villupuram District

Year	Season		
	Kharif	Rabi	Total
Area (ha)			
2008-09	5,589	8,614	14,203
2009-10	3,690	7,967	11,657
2010-11	1,692	8,656	10,348
Triennium average ending 2010-11*	3,657	8,412	12,069
Projected area for 2022-23	3,657	8,412	12,069
% to total	30.30	69.70	100.00
Varieties	K6	K6	-
Maximum yield as per Crop Cutting Experiment (Kg/ha)	4,963	4,963	4,963
Average yield for Triennium average ending 2010-11 (Kg/ha)*	3,551	3,092	3,883
Yield Gap (Kg/ha)	1,412	1,871	1,080
Projected Production for 2022-23 (tonnes)	18,150	41,750	59,900
Production for Triennium average ending 2010-11 (tonnes)*	12,986	26,008	38,994
Percentage of increase in production over 2010-11	39.76	60.53	53.61

** Source: Season and Crop Reports of 2008-09, 2009-10 and 2010-11.*

Table 3.14 Projected increases in Yield and Production of Groundnut 2011- 2012 to 2022-2023 in Villupuram District

Year	Yield (Kg per ha)			Production (Tonnes)		
	Kharif	Rabi	Total	Kharif	Rabi	Total
Triennium average ending 2010-11	3,551	3,092	3,882	12,986	26,008	38,994
2011-12	3,669	3,248	3,972	13,416	27,320	40,736
2012-13	3,786	3,404	4,062	13,847	28,632	42,478
2013-14	3,904	3,560	4,152	14,277	29,944	44,221
2014-15	4,022	3,716	4,242	14,707	31,255	45,963
2015-16	4,139	3,872	4,332	15,138	32,567	47,705
2016-17	4,257	4,028	4,423	15,568	33,879	49,447
2017-18	4,375	4,183	4,513	15,998	35,191	51,189
2018-19	4,492	4,339	4,603	16,429	36,503	52,931
2019-20	4,610	4,495	4,693	16,859	37,815	54,674
2020-21	4,728	4,651	4,783	17,289	39,126	56,416
2021-22	4,845	4,807	4,873	17,720	40,438	58,158
2022-23	4,963	4,963	4,963	18,150	41,750	59,900
Required Growth Rate (%)	2.82	4.00	2.07	2.82	4.00	3.62

The annual growth rate required to raise the yield and production of groundnut in 2022-23 is approximately 2.07 and 3.62 per cent per annum respectively as indicated in Table 3.14.

The projected increase in the yield and production of the selected crops during the period from 2011-12 to 2022-23 are given in Table 3.15. The increase in paddy, black gram and food grain production are estimated at 83.8 per cent, 68.8 per cent and 83.7 per cent respectively. Along with the increase in the production of these two food grains, if efforts are taken to raise the productivity of other cereals and pulses, the overall food grain production could be doubled from the existing levels. Similarly, there exists a scope to enhance the production of sugarcane, cumbu and groundnut by 19 per cent, 20.4 per cent and 54 per cent respectively during the year 2022-23.

Table 3.15 Projection of Agricultural Production for 2022-23 in Villupuram District

Sl. No.	Crop	Area (ha)		Yield (Kg / ha)			Production (Tonnes)		
		2010 - 11*	2022 - 23**	2010-11*	2022-23**	Difference between 2010-11 and 2022-23	2010-11*	2022-23**	Difference between 2010-11 and 2022-23
1.	Paddy	82134	82134	3338	6134	2796 (83.75)	274123	503773	229650 (83.78)
2.	Black gram	4899	4899	468	750	282 (60.14)	2176	3674	1498 (68.84)
3.	Food grains	87033	87033	1903	3442	1539 (80.87)	276299	507447	231148 (83.66)
3.	Sugar-cane	6171	6171	108000	128500	20500 (18.98)	664717	792974	128257 (19.29)
4.	Mango	7097	7097	2458	2458	7510 (205.57)	5052	25302	77080 (204.64)
5.	Ground-nut	12069	12069	3883	4963	1080 (27.81)	38994	59900	20906 (53.61)

** Source: Season and Crop Reports of 2008-09, 2009-10 and 2010-11** Triennium 2010-11;
**Projected for 2022-23;

To sum up, the sustained raise in the productivities of major crops could be achieved only with the combined efforts of scientists, extension functionaries and farmers. The varieties suitable to different agro-climatic conditions and production environment need to be identified by the agricultural scientists. The dissemination of technologies and timely supply of quality seeds, and other inputs like fertilizers and plant protection chemicals, machineries and tools are to be ensured by the agricultural extension officials. Banking sector should take steps to 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 regulated and co-operative marketing societies are required to create adequate infrastructure facilities like grading, packing and storing the produces at different production centres of the district. It is also suggested that the farmers are to make use of the several benefits such as subsidized seeds, fertilizers, plant protection chemicals, machineries and tools, extended through various agricultural development programmes. They should also come forward to adopt the good agricultural practices and technologies developed by the agricultural research institutes.

3.5 Production Constraints in Agriculture

A meeting was convened involving the farmers and extension officials district and scientists of Krishi Vigyan Kendra in Villupuram district to discuss the production constraints that hinder agricultural development and suggestions to achieve the higher agricultural production by 2023. In the discussion, more focus was given for the development of selected crops, *viz.,* paddy, black gram, sugarcane, cumbu and groundnut. The constraints and suggestions that emanated from the discussion are listed below in Table 3.16.

Table 3.16 Constraints Faced and Suggestions for the Agricultural Development in Villupuram District

Sl.No.	Crop	Constraints Faced	Suggestions
1.	Paddy	• Yield in *Kharif* is low due to varietal impurity • Private dealers are selling fertilizers at higher prices • During Jul. – Dec, except paddy no other crop can be cultivated. • Due to labour problem harvesting is a problem in paddy. • Improper weed management because of labour problem and facing difficulty to operate cono-weeder • Lack of awareness about new technologies in rice	• Creating awareness about micronutrient deficiencies. • Demonstration programme about new technologies like SRI, paddy transplanter • Supplementing information on organic rice farming and DEMIC cell activities with export details. • Subsidy for purchasing power tiller and mini harvesting machine. • 50 per cent subsidy for weeders in SRI is needed to minimize labour problem and also developing cono-weeder as power weeder for easy operation.
2.	Blackgram	• Recommended after cultivation practices viz– weeding, plant protection measures, etc. are not followed properly.	• VBN Black gram variety 4, 6 and 8 may be popularized.
3.	Sugar cane	• Non-availability of quality seed material (setts) • Inadequate supply of potash fertilizer • Poor adoption of SSI techniques due to labour shortage • Poor service by the dealers of drip irrigation pipes • Poor adoption of precision farming techniques • Red rot is a major problem	• Coverage of larger area under Co 86032. • SSI technologies may be popularized • Bio-fungicides control measure may be disseminated at frequent intervals.
4.	Mango	Old trees (more than 20 years) / Cultivation with old varieties Non adoption of Rejuvenation / Gap-filling Absentee landlordism Non adoption of spraying practices to prevent Button shedding / Flower dropping	Larger coverage of the existing scheme to replace old varieties with varieties like Alphonsa. High density planting may be taken up with better orchard management techniques.
5.	Ground nut	Non availability of pure varieties, non availability of gypsum in time and poor population (density/m^2) Ground nut is replaced by paddy and black gram due to price advantage Labour shortage for harvesting (stripping)	Seed materials of TMV 13 and TMV 14 may be supplied in adequate quantity

Table 3.17 Technological interventions and strategies to reduce the yield gaps

Major crops & enterprises being practiced in the district	Prioritized problems in these crops/enterprise	Title of Interventions	Technology options	Proposed Interventions
Paddy	Lack of knowledge on high yielding varieties of paddy	Assessment of location specific high yielding paddy varieties	The location specific high yielding varieties of paddy released by TNAU are found suitable for this district Season- Sornavari (April – May) High Yielding Varieties- ADT 36, 37, ASD 16, ASD18, MDU 5, ADT 43, CO 47, CORH 3, ADT(R) 47. Season- Samba (August) High Yielding Varieties- White Ponni, Paiyur 1, Bhavani CO 43, CO(R) 49, TRY 1, TNAU Rice ADT 50. Season- Navarai (Dec –Jan) High Yielding Varieties- ADT 36, MDU 5, CORH 3.	On farm trial, field demonstrations, seed multiplication and distribution of hybrid seeds to the farmers etc.,
	Seed borne diseases caused by fungus and bacteria leads to severe loss	Management of seed borne diseases through seed treatment, bio control agents and chemicals	• Seed hardening with 1% KCl (seed and KCl solution 1:1) for 16 hours to withstand early moisture stress • Seedling dip with *Pseudomonas fluorescens* (Pf-1) @ 2.5 kg/ha or seed treatment (10g/kg)	On farm trial, field demonstrations, mass production of *P. fluorescens* at research stations, KVK's, constituent colleges for supply to the farmers at subsidy, organizing training on mass production of bio control agents

Table 3.17 Technological interventions and strategies to reduce the yield gaps (Contd.,)

Major crops & enterprises being practiced in the district	Prioritized problems in these crops/enterprise	Title of Intervention	Technology options	Proposed Intervention
	Reduction in yield and incurring of loss by the farmers due to erratic rainfall. Reduction in quality of rice due to nutrient imbalance	Popularization of SRI rice cultivation in the drought prone areas	• Adoption of SRI technique with low seed rate (5-7 kg/ha), wider spacing (25 cm × 15cm) and improved package of practices. • Foliar Nutrition in flowering stage: - 2% DAP + 1% KCL + 1% Urea at 50% flowering stage or TNAU Rainfed rice MN mixture @ 12.5 kg/ha as EFYM at 1:10 ratio at tillering and panicle initiation stages	Field demonstrations, distribution of seeds to farmers at subsidized rate. Production and supply of TNAU micronutrient mixtures at university research stations and KVK's
	Pests and diseases like rice blast, sheath blight, rice root and white tip nematodes and sucking pests are widely prevalent which results in yield decline.	Assessment of efficacy of pesticides and bio control agents on pest control in rice. Mass multiplication of bio control agents at district headquarters/research stations/KVK's	• Rice blast & Sheath blight – Seed treatment with TNAU Pf 1 10 ml/kg of seeds or spray Carbendazim 50WP @ 500g/ha or Tricyclozole 75 WP @ 500g/ha or Azoxystrobin 25 SC @ 500 ml/ha or Neem oil at 3% • Rice root and White tip nematodes - Seed treatment with *Pseudomonas fluorescens* (10 g/kg seed) and as foliar spraying @ 1 kg/ha thrice at 45, 55 and 65 DAT. • Sucking pests (Brown leafhopper, Green leaf hopper, Thrips& Gall midge), Stem borer and leaf folder – Spray Fipronil 5% SC 1000-1500 ml/ha or Triazophos 40% EC 625-1250 ml/ha or Seed treatment @ 5g/Kg of seed and foliar application of *Beauveria bassiana*@ 5g/ltwice at 15 days interval	On farm trial, field demonstrations, mass multiplication and supply of TNAU bio control agents at subsidized rate from all the research stations and KVK's

Table 3.17 Technological interventions and strategies to reduce the yield gaps (Contd.,)

Major crops & enterprises being practiced in the district	Prioritized problems in these crops/enterprise	Title of Intervention	Technology options	Proposed Intervention
	Scarcity of labour for mechanical operations	Popularization agricultural equipment's and machineries in paddy cultivation	• Seed drill – Sow of seeds with 20 cm inter row spacing • Rotary weeder - Single row or double weeder for weeding • Combine harvester for harvesting	Distribution of seed drill, rotary weeder to the paddy farmers at subsidized rate Make availability of combine harvester at the Department of Agricultural Engineering for different blocks at rental basis, training and demonstrations
Sugar cane	Lack of knowledge on selection in high yielding varieties of sugarcane	Performance evaluation of high yield varieties, Popularization of varieties suitable for specific location	The primary seed materials are available in large quantity at the Sugarcane Research Stations at Cuddalore, Sirugamani and Melalathur. Suitable Varieties- Co 86032, Co Si(Sc)6, Co G (Sc)5, Co C (Sc)22, Co 97009, CoV 94101, CoC 90063, CoSi 95071, CoC 24 TNAU SC Si7, TNAU SC Si 8	Distribution of setts of high yielding sugar cane varieties, training and field demonstrations,
	Less plant population caused delay in achievement of potential yield of varieties	Evaluation of sugarcane varieties under different planting densities, popularization of technologies	• Paired row system of planting double side planting of sugarcane setts with 150 + 30 cm spacing for Astraf 8000 series (Mechanical harvester) operated areas and 150 + 30 cm spacing for New Holland 4000 series operated areas may be adopted with single row of cane planting.	Research and development, popularization of technologies through trainings and demonstrations

Table 3.17 Technological interventions and strategies to reduce the yield gaps (Contd.,)

Major crops & enterprises being practiced in the district	Prioritized problems in these crops/enterprise	Title of Intervention	Technology options	Proposed Intervention
	Lack of knowledge on application of growth regulators and chemicals to increase yield and sugar percentage	Popularization / dissemination of technologies through different modes	• Growth hormones: Foliar application of TNAU Sugarcane Booster @ 1.0, 1.5 and 2 kg/acre in 200 litres of water at 45,60 and 75 days after planting enhances cane growth and weight, internodal length, cane yield, sugar content and offers drought tolerance. • Application of Micronutrients: To provide all micronutrients to sugarcane, 50 kg /ha of micronutrient mixture containing 20 kg Ferrous sulphate, 10 kg Manganese sulphate, 10 kg Zinc sulphate, 5 kg of Copper sulphate, 5 kg of Borax mixed with 100 kg of well decomposed FYM, can be recommended as soil application prior to planting or Apply TNAU MN mixture @ 50 kg/ha as EFYM for higher cane yield. • Application of cane ripener**:** Spraying of Sodium metasilicate 4 kg/ha in 750 litres of water on the foliage of crop at 6, 8 & 10th month after planting will enhance cane yield and sugar percentage.	Mass production and distribution of TNAU Sugarcane boosters at different centres of TNAU Supply of TNAU micronutrient mixture at subsidized rate Dissemination of technologies through on farm trial, trainings and field demonstrations Through pamphlets, books and notices etc.

Table 3.17 Technological interventions and strategies to reduce the yield gaps (Contd.,)

Major crops & enterprises being practiced in the district	Prioritized problems in these crops/enter prise	Title of Intervention	Technology options	Proposed Intervention
	Lack of knowledge on integrated pest and disease management	Standardization of pest management strategies for sugarcane	• Red rot: Sett treatment with Carbendazim before planting (Carbendazim 50 WP @ 0.05% or Carbendazim 25 DS @ 0.1% along with 1.0% Urea for 5 minutes) • Smut: Sett treatment with fungicides *viz.*, Triadimefon @ 0.1% or Carbendazim @ 0.1% for 10 minutes or Treating the seed setts with Aerated Steam Therapy (AST) at 50 ºC for 1 hour or in hot water at 50 ºC for 30 minutes or at 52 ºC for 18 minutes • Shoot borer: Spraying of Fipronil 5 % SC 1500-2000 ml/ha or Fipronil 0.3 % GR 25-33.3 Kg/ha or intercropping of daincha in sugarcane can lower the shoot borer incidence. • Termite: Dip the setts in imidacloprid 70 WS 0.1% or Chlorpyriphos 20 EC 0.04 % for 5 minutes or Imidacloprid 17.8% SL 350 ml/ha or Chlorpyriphos 20%EC 750 ml/ha.	Training and demonstration's on disease and pest management, distribution pest control kits on subsidy
	Preparation of setts and sugarcane planter is a labour intensive work	Popularization of technologies for sugarcane sett cutting and planting	• Sharp knife or sett cutting machine was developed by TNAU to prepare setts without splits. • TNAU mechanical planter is useful for cost effective planting with saving of Rs.3750 / ha and it can cover an area of 1.5 ha/day	Distribution of sett cutting machines and sugarcane planter in a block on custom hiring basis, training and demonstrations

Table 3.17 Technological interventions and strategies to reduce the yield gaps (Contd.,)

Major crops & enterprises being practiced in the district	Prioritized problems in these crops/enterprise	Title of Intervention	Technology options	Proposed Intervention
Groundnut	Lack of knowledge on high yielding varieties	Popularization and distribution of seed nuts through Department of Agriculture	Season- Karthigaipattam (Rabi) (Dec-Jan) Varieties / hybrids- TMV 13 CO 7 VRI 2,6 Season- Anippattam Varieties / hybrids- VRIGn 7, TMVGn 13, TMV 7, VRI 2, VRIGn 5. Season- Adipattam (kharif) (June-July) Varieties / hybrids – TMV 13, VRI 7, Co.6	Distribution of seeds at subsidy, training and demonstration on performance of high yielding varieties
	Less productivity due to non-adoption of advanced technologies	Promotion / dissemination of advance crop cultivation technologies	• Seed Treatment with talc formulation of *Trichoderma viride*@ 4 g/kg seed or *Pseudomonas fluorescens* @ 10 g/kg seed (or) with Thiram or Mancozeb @ 4 g/kg of seed or Carboxin or Carbendazim at 2 g/kg of seed (or) Treat the seeds with 3 packets (600 g)/ha of Rhizobial culture TNAU14 + 3 packets of Azospirillum (600 g/ha) and 3 packets (600 g/ha) of Phosphobacteria or 6 packets of Azophos (1200 g/ha) developed at TNAU using rice kanji as binder • Micronutrients: TNAU MN mixture @ 7.5 kg /ha as Enriched FYM (Prepare enriched FYM at 1:10 ratio of MN mixture & FYM; mix at friable moisture &incubate for one month in shade) under rainfed conditions. • Apply Calcium Sulphate (Gypsum) @ 400 kg/ha by the side of the plants on 40th to 70th day depending upon soil moisture.Avoid gypsum in calciferous soils. Gypsum is effective in soils deficient in calcium and sulphur. Application of gypsum encourages pod formation and better filling of the pods. Application of gypsum at the rate of	Mass production and supply of bio control agents / bio fertilizers at subsidy, distribution of TNAU MN mixture during rain fed conditions, supply of gypsum, polythene mulching sheet, TNAU ground nut rich in subsidy, dissemination of technologies etc.,

			200 kg/ha basal both in rainfed and irrigated condition as basal and astop dressing @ 40 DAS reduces Khadhasty malady and pod scab nematode under rainfed conditions. • Spray nutrient solution prepared by soaking DAP 2.5 kg, Ammonium sulphate 1 kg and borax 0.5 kg in 37 lit of water overnight. The next day morning it can be filtered and about 32 litre of mixture can be obtained and it may be diluted with 468 lit of water so as to made up to 500 litre to spray for one ha. Plano fix at the rate of 350 ml can also be mixed while spraying. This can be sprayed on 25th and 35th day after sowing under rainfed conditions. • Polythene Film Mulching: Spread black polythene sheet (90 cm width) over the soil surface. • Irrigation based on physiological growth phases. ▪ Life irrigation – 4 to 5 days after sowing ▪ Pegging stage - 1 or 2 irrigations should be given ▪ Flowering stage – 2 irrigations should be given ▪ Pod development stage - 2 to 3 irrigations should be given • Foliar spray of TNAU Groundnut Rich @ 2 kg/acre in 200 litres of water at peak flowering and at pod development stages increases flower retention, pod filling and improves moisture stress tolerance and pod yield. • Spraying 0.5% Potassium chloride during flowering and pod development stages will aid to mitigate the ill effects of water stress.	

Table 3.17 Technological interventions and strategies to reduce the yield gaps (Contd.,)

Major crops & enterprises being practiced in the district	Prioritized problems in these crops/enterprise	Title of Intervention	Technology options	Proposed Intervention
	Harvesting and separation of groundnut pod is a laborious task	Popularization of TNAU ground nut stripper	Farm mechanization: Groundnut stripper developed by TNAU can be used for stripping the pods from the plants	Distribution of groundnut stripper at subsidy, training and demonstrations on groundnut stripping
Mango	Less productivity due to less population and older varieties	Promotion of high density planting systems and advanced management techniques	• High Density Planting: 5 m x 5 m (400 plants / ha). Dwarf statured varieties with narrow canopy are much suitable for HDP system. • Double hedge row system: Adopt a spacing of 5 m x 5 m within double rows and 10 m between successive double rows (266 plants / ha)	Training and field demonstrations on HDP systems in fruit crops, subsidy for promotion of HDP systems
	Reduction on productivity by old varieties and long old orchards	Promotion of rejuvenating old orchards through top working techniques	• Top working of senile orchards for rejuvenation: Use scions of choice varieties like Alphonso and Banganapalli for top working. Behead the trees to be top worked portion during July- August leaving the main trunk at a convenient height and allow for new shoots to develop. Adopt cleft method of grafting or softwood grafting on the emerging shoots on the main stem from the cut end during September- October.	Training and demonstrations on rejuvenation, introduction of subsidy component for converting unfruitful old orchards to fruitful one, dissemination of technologies

Table 3.17 Technological interventions and strategies to reduce the yield gaps (Contd.,)

Major crops & enterprises being practiced in the district	Prioritized problems in these crops/enterprise	Title of Intervention	Technology options	Proposed Intervention
	Fruit yield is reduced by non-application of nutrient s and chemicals at critical stages of the crop	Foliar spraying of chemicals and secondary nutrients at critical stages of the crop during peak season	• Spray NAA @ 20 ppm at flowering to increase the fruit retention. • During February 0.5% Urea (5 g / lit.) or 1% Potassium nitrate (10 g / lit.) may be sprayed to induce flowering, if trees do not flower by that time. • Spray 2% KNO3 at mustard size (fruit) to increase fruit set and retention of fruits. • Spray 2 % Sulphate of potash at pea stage and 15 days after to improve yield and quality.	• Distribution of nutrients and chemicals at subsidy • Training and demonstrations on chemical application • Dissemination if technologies through pamphlets (multilingual languages), books, notices etc.,
	Irregular bearing nature of mango leads to fluctuation in the yield and income to the farmers	Promotion of off season production of mango through chemical application and pruning time	• To induce off-season flowering**,** heading back of 10 cm terminal growth after the emergence of new growth (vegetative and floral growth) during December to January along with soil application of Paclobutrazol @ 0.75g a.i. per tree during March and April is recommended for mango cv. Neelum. Keeping good soil moisture conditions and nutrient health status of the plant are very important when Paclobutrazol application is resorted.	• Training and demonstration on off season mango production • Distribution of Paclobutrazol in subsidy
	Economic loss occurs due to mis management of pests and diseases in the mango orchard	Integrated disease and pest management through new generations fungicides and insecticides	• Anthracnose and Stalk end-rot: Spray Mancozeb 2 g / lit or Carbendazim 1 g / lit or Thiophanate methyl 1 g / lit or Chlorothalonil 2 g / lit as pre-harvest spray, 3 times at 15 days interval (or) Spray chitin based *Pseudomonas fluorescens* (Pf 7) immediately after flowering @ 5 g / lit five times at 21 days interval.	• Supply of recommended dose of insecticides and fungicides as a kit on subsidy basis during onset of the pests and diseases

Table 3.17 Technological interventions and strategies to reduce the yield gaps (Contd.,)

Major crops & enterprises being practiced in the district	Prioritized problems in these crops/enter prise	Title of Intervention	Technology options	Proposed Intervention
Black gram	Lack of knowledge on high yielding and season specific varieties	Popularization of high yielding varieties	Season- Adipattam (June-July) Varieties hybrids-VBN(Bg) 5, VBN 6, 7. Season- Markazhi – Thaipattam (winter irrigated) (Dec-Jan) Varieties/ hybrids- VBN (Bg)4, TMV 1, VBN 6,7, 8, MDU 1, ADT.5 Season- Rice fallows (January) Varieties hybrids- ADT 3 Season- Chithiraipattam (summer irrigate) Varieties hybrids- ADT 5 Seed treatment:Treat the seeds with Carbendazim or Thiram @ 2 g/kg of seed 24 hours before sowing (or) withtalc formulation of *Trichoderma viride* @ 4g/kg of seed (or) *Pseudomonas fluorescens* @ 10 g/kgseed. Bio control agents are compatible with biofertilizers. First treat the seeds with Bio control agentsand then with Rhizobium. Fungicides and bio control agents are incompatible. IPNS - Soil test crop response based integrated plant nutrition system (STCR-IPNS)recommendation may be adopted for prescribing fertilizer doses for specified yield targets. Micronutrient mixture:Soil application of TNAU micronutrient mixture @ 5 kg/ha as Enriched FYM (Prepare enriched FYM at 1:10 ratio of MN mixture &FYM ; mix at friable moisture &incubate for one month inshade). FOLIAR APPLICATION 1% urea for yield improvement in black gram : 30 and 45 days after sowing To mitigate moisture stress: 2% KCl + 100 ppm Boron during dry spell as mid-season managementpractice	• Seed supply • Trainings • Demonstrations • Research and development • 50% subsidy • Seed production

	Yield reduction due to non-adoption of advanced crop management practices	Popularization of technologies to the farmers	Micronutrients through seed treatment for blackgram: Seed coating with biofertilizers and micronutrients viz., Zn, Mo & Co @ 4, 1, 0.5 g/kg of seed Nitrogen substitution by organic sources for pulses: 50 per cent nitrogen can be substituted through organic source (850 kg of vermicompost perhectare). Diammonium Phosphate or Urea, NAA And Salicylic Acid spray:NAA 40 mg/lt once at pre-flowering and another at 15 days thereafter Pulse Wonder: 5 kg/ha once at flowering or DAP 20 g/litre once at flowering and another at 15 days thereafter	• Input supply at subsidized cost • laying out demonstration plots • Trainings • Exposure visits • Supply of spraying equipment's • Mass production of growth solutions
Vegetables		Promotion of vegetables in this region	• Drip irrigation for vegetable cultivation may also be supported with subsidy. • Importance may be given consumer preferred vegetables cultivation. • Area under alternate crops like maize, vegetables- bitter gourd, snake-gourd, ribbed gourd, cluster beans, Chillies, tomato, brinjal etc., may be expanded. • Cold storage godowns may be formed in vegetables growing areas. Grading yard may be formed	• Micro irrigation systems • Cold storage erection • Pandal vegetable cultivation • Drying and Grading yard • Value addition unit • Post-harvest processing unit • Trainings • Demonstrations • Field visits • Seed supply at subsidy
Cumbu	Cultivation area is less	Promotion of cumbu cultivation in the district	• More campaigns may be organized to popularize the importance of millets • Seeds of high yielding varieties/hybrids may be supplied	• Seed supply, • Awareness programme • Post-harvest and value addition

Table 3.18 The ongoing schemes with financial assistance from the GOI

Sl. No.	Schemes	Name of the component	Subsidy amount
1	Seed village program	Distribution of rice and millet seeds	50%
		Pulses and oilseeds	60%
2	Coconut program	Integrated management OFT	₹ 17,500/ha
3	Rice development	Seed distribution Machine planting Distribution of Zn/so4 Distribution of herbicides	₹ 10/kg ₹ 1,500/ha ₹ 500/ha ₹ 500/ha
4	Pulses development	Transplanting in Red gram Techniques in redgram	₹ 7,500/ha
5	Groundnut development	Distribution of biofertilizers Distribution of gypsum and Tarpaulins Distribution of pipes and Rain gun	50% 50% 50% 50%
6	Millets and Minor millets development	OFT on Cumbu OFT on Ragi OFT on Minor millets OFT on Hybrid maize Training to farmers	₹ 3,000/ha ₹ 2,000/ha ₹ 2,000/ha ₹ 3,000/ha ₹ 15,000/ha
7	Sugarcane development	SSI	₹ 35,000/ha
8	National Food grain programme	Distribution of certified seeds	₹ 25/kg
9	Machinery	Distribution of Rotavator Seed drill Transplantor Mobile sprinkler PVC Pipes	₹ 35,000/No. ₹ 15,000/No. ₹.15,000/No. ₹.15,000/No. 50%

CHAPTER IV

DISTRICT PLAN

The interventions proposed, the associated outlays, the physical targets, budgetary requirements, time frame for achievements in the sectors *viz*., agricultural (field crops), horticultural, agricultural engineering, agricultural marketing, animal husbandry and fisheries are discussed in this chapter. This would comprehend the activities and the achievements to be made in beyond twelfth plan.

4.1. AGRICULTURE

The development of agriculture sector has been aimed at by mainly pushing up the productivity levels of the major crops *viz*. Rice, Millets, Pulses, Oilseed, Sugarcane, Cotton, Coconut and others in the district. Activities planned for and the costs involved under each crop are detailed below.

4.1.1. Enhancing paddy productivity

Rice is one of the most important food grain crops of Tamil Nadu state. In Villupuram district, rice is an important cereal crop grown in an area of about 1, 52, 504 ha. Rice is the major predominant crop of this district. Hence in order to increase the area of production, proposals were prepared to distribute quality rice seeds.Mechanization is becoming popular and need of the hour. In order to motivate the farmer's to become the seed producer, incentives for machine transplanting is more focused. It is estimated to cover more than one lakhs hectares with an incentive amount of 50,000 lakhs rupees.To enhance the paddy productivity in the district the proposals includes the distribution of bio fertilisers, zinc sulphate, herbicides, micro nutrients, gypsum, and soil health card.Thus the overall goal is to increase the yield and production of the rice grown in Villupuram district through the use of high yielding varieties along the adoption of the SRI techniques.

Project Components

a) Promotion of SRI
b) Production of foundation and certified seeds
c) Distribution of foundation and certified seeds
d) Distribution of Incentives for paddy machine planting
e) Distribution of portrays, MN Mixture, bio fertilisers, zinc sulphate, bio control agents, herbicides, and poly vinyl coated tarpaulin

Budget

The budget requirement for fulfilling the various interventions is ₹ **7432.30** Lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.1.

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 Paddy

(₹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	Promotion of SRI	Ha	0.150	All blocks	200	30.00	2180	327.00	2870	430.50	3505	525.75	4170	625.50	12925	1938.75
2	Distribution of High Yielding Varieties	MT	0.350	All blocks	532	186.20	674	235.90	803	281.05	957	334.95	1099	384.65	4065	1422.75
3	Distribution of Foundation seeds	MT	0.400	All blocks except B2, B7, B9, B10, B12, B20 , B22	0	0.00	351	140.40	427	170.80	500	213.00	565	226.00	1843	750.20
4	seed production - Foundation	MT	0.320	All blocks except B2, B7, B10 , B12, B20, 22	0	0.00	300	96.00	361	115.52	365	116.80	369	118.08	1395	446.40
5	seed production - Certified class	MT	0.260	All blocks except B7 and B22	352	91.52	438	113.88	514	133.64	543	141.18	562	146.12	2409	626.34
6	Incentives for paddy machine planting	Ha	0.100	All blocks	1467	146.70	1748	174.80	1924	192.40	2071	207.10	2297	229.70	9507	950.70
7	Distribution of Protray	No	0.001	All blocks except B9	1895	1.52	2176	1.74	2440	1.95	2885	2.31	3240	2.59	12636	10.11
8	Distribution of MN mixture/ Copper Sulphate	Ha	0.010	All blocks	3302	33.02	3557	35.57	3589	35.89	3616	36.16	3647	36.47	17711	177.11
9	Distribution of biofertilizer / PPFM / bioinputs / plant nutrient mobilizing bacteria	Ha	0.003	All blocks	4716	14.15	5008	15.02	5386	16.16	5791	17.37	6279	18.84	27180	81.54
10	Distribution of Zinc sulphate (Soil application & foliar)	Ha.	0.010	All blocks	11440	114.40	12065	120.65	12120	121.20	12220	122.20	12285	122.85	60130	601.30
11	Distribution of biocontrol agents/biopesticides	Ha..	0.010	B6 and B21	0	0.00	200	2.00	220	2.20	240	2.40	290	2.90	950	9.50

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
13	Distribution of herbicides	Ha.	0.010	All blocks	5325	53.25	5695	56.95	6028	60.28	6330	63.30	6570	65.70	29948	299.48
15	Polyvinyl coated Tarpaulin (6m x 5m)	No.	0.020	B6 and B21	0	0.00	20	0.40	33	0.66	45	0.90	58	1.16	156	3.12
17	Establishment of community paddy nursery	Ha.	0.25	All Blocks	10	3.00	10	3.00	10	3.00	10	3.00	10	3.00	50	15.00
18	Demonstration of drip irrigation	Ha	1.00	All Blocks	20	20.00	20	20.00	20	20.00	20	20.00	20	20.00	100	100.00
	Total					**693.76**		**1343.31**		**1585.25**		**1806.42**		**2003.56**		**7432.30**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.2. Enhancing millets productivity

Millets are gaining momentum among the consumers at the wake of their importance in nutrition. The improved/hybrid varieties as well as the packages of practices have been developed for increasing the fodder and grain production of millets. Now value addition to millet and minor millets is gaining momentum for the preparation of healthy food. In Villupuram district 48, 439 hectares of area was cultivated under millet crops both under rain fed and irrigated condition. Average yield was around 2.5 tonnes/ha for cumbu, 3.3 tonnes/ ha for ragi, 6 tonnes/ ha for maize and 1.3 tonnes/ ha for varagu. Now it has been targeted to increase it by 7tonnes/ ha for maize and 4-5tonnes/ha for other millets at the end of five year periods. Therefore it is proposed to cover 50 percent of the area by using quality and improved high yielding varieties.

Project Components

a) Distribution of LPG operated bird scarrer
b) Expansion of area under minor millets
c) Distribution of bio-fertilizers for cumbu
d) Establishment of millet processing units for minor millets
e) Distribution of seeds for cumbu and ragi
f) Seed treatment for cumbu

Budget

The budget requirement for fulfilling the various interventions is ₹**785.76** Lakhs. The details of budget requirement for each intervention across the blocks is furnished in the table 4.2.

Expected outcome

There is a scope to increase the area under millets in Villupuram district. By distributing improved varieties/ hybrids of millets will certainly improve the living standard of the farmers of this tract. These measures increase the yield of millets in the district and increase the per capita availability of millets. The availability of millets with affordable price can be met by initiating these measures.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.2 Budget Requirement for Millets

(₹in lakhs)

Sl. No	Components	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Distribution of LPG operated Bird Scarrer	Nos.	0.1	All Blocks	2.63	0.26	4.95	0.50	5.5	0.55	6.05	0.61	6.6	0.66	25.73	2.58
2	Distribution on biofertilizer - Liquid / Carrier	Ha	0.003	Rishivanthanam, Sankarapuram, China salem, Ginge, Kalakurich, Kanai, Mailam, Mugayur, Thirukovilur, Thirunavalur, Thiyagadurgam and Ulunthurpet	1850	5.55	3315	9.95	3945	11.84	4535	13.61	4835	14.51	18480	55.46
3	Expansion of area under Minor Millets (Demo - supply of seed, seed treatment, MN mixture & Organic package)	Ha	0.05	Vikravandi	0	0.00	5	0.25	8	0.40	10	0.50	12	0.60	35	1.75
4	Millet Processing unit-Minor millet	Nos.	2.5	Vikravandi	0	0.00	0	0.00	1	2.50	0	0.00	1	2.50	2	5.00
5	Soil moisture conservation practices	Ha	0.05	All blocks	150	7.50	100	5.00	125	6.25	150	7.50	120	6.00	645	32.25
6	Initiative for Nutritional Security through Intensive Millet Promotion (INSIMP)	ha	0.04	All blocks	300	12.00	300	12.00	300	12.00	300	12.00	300	12.00	1500	60.00
	Cumbu															
7	Demonstration (Supply of seed, seed treatment,	Ha	0.05	Rishivanthanam, Sankarapuram, China salem, Kalakurich,	800	40.00	1695	84.75	2245	112.25	2795	139.75	3345	167.25	10880	544.00

Sl. No	Components	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	MN mixture & Organic package)			Kanai, Mailam, Mugayur, Thirukovilur, Thirunavalur, Thiyagadurgam and Ulunthurpet												
8	Distribution of biofertilizers Liquid / Carrier	Ha	0.003	All blocks	2.83	0.01	5.26	0.02	5.6	0.02	7.4	0.02	9.3	0.03	30.39	0.1
9	Seed Distribution	MT	0.53	Vikravandi	0	0.00	1	0.53	1	0.53	1	0.53	1	0.53	4	2.12
	Ragi															
10	Seed distribution	MT	0.66	All Blocks	15	9.90	20	13.20	25	16.50	30	19.80	35	23.10	125	82.50
	Total					**75.22**		**126.20**		**162.84**		**194.32**		**227.18**		**785.76**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.3. Enhancing pulses productivity

Pulses are one of the important food components for health of the human being. The state of Tamil Nadu is a deficit state in pulse requirement. With a decreasing area under cultivation, the possibility to improve the production of pulses is only through increasing the productivity of pulses through the adoption of better seed varieties and package of practices. In general pulses are the least cared cops in Villupuram district. In the district pulses was grown in area of 67, 426 ha and the yield is around 500-1000kg. By research it is found that the pulses respond very well for fertilizer application, especially for foliar application of phosphatic fertilizer (DAP) during peak flowering stage. Encouragement should be given to bring more area under pulses which can be achieved by providing incentives. Thus the overall objective is to increase the yield by 10 percent through the use of high yielding varieties and providing incentives.

Project Components

a) Purchase of breeder seeds
b) Production of foundation seeds
c) Production and distribution of certified pulse seeds
d) Distribution of gypsum, bio fertilizers,micro nutrients, DAP spray, pulse wonder, yellow sticky trap/pheromone trap, weedicide and plant protection chemicals
e) Demonstration on bund cropping, line sowing
f) Demonstration on cropping system

Budget

The budget requirement for fulfilling the various interventions is ₹**36051.99** 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 result in availability of required quantity of pulses to the people as per the recommendation of the nutritionists.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.3. Budget requirement for Pulses

(₹in lakhs)

Sl. No	Interventions	Unit	Unit cost	Block Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Purchase of breeder seeds	MT	250000	B2, B10, B12, B20, B21 B22	0.05	0.13	550	1375.00	0	0.00	0.05	0.13	550	1375.00	1100.1	2750.26
2	Production of Foundation/ Certified pulses seeds	MT	86000	All blocks	2963	2548.18	3203	2754.58	3280	2820.80	3310	2846.60	3490	3001.40	16246	13971.56
3	Distribution of Certified Seeds	MT	100000	All blocks	3125	3125.00	3345	3345.00	3446	3446.00	3556	3556.00	3710	3710.00	17182	17182.00
4	Distribution of Gypsum	ha	400	All blocks	11220	44.88	11755	47.02	12665	50.66	13575	54.30	14465	57.86	63680	254.72
5	Distribution of Biofertilizer/ Organic packages (Rhizobium + Phosphobacteria) - Liquid / Carrier	Ha	600	All blocks	954	5.72	1190	7.14	1390	8.34	1590	9.54	1780	10.68	6904	41.42
6	Distribution of Micro Nutrients(5 kgs/ Ha)	Ha	350	All blocks	3875	13.56	4850	16.98	4890	17.12	4930	17.26	5040	17.64	23585	82.56
7	DAP Spray	Ha	700	B6 and B21	0	0.00	100	0.70	120	0.84	140	0.98	160	1.12	520	3.64
8	Pulse wonder - 5 kg/ha	Ha	1000	All blocks except B5, B6, B7,B8	2530	25.30	3400	34.00	3650	36.50	3940	39.40	4140	41.40	17660	176.60
9	Bund Cropping	Ha	300	All blocks	2910	8.73	4660	13.98	4690	14.07	4700	14.10	4720	14.16	21680	65.04
10	Line sowing	Ha	2250	All blocks	500	11.25	800	18.00	900	20.25	1000	22.50	1150	25.88	4350	97.88
11	Distribution of Yellow sticky trap /pheromone trap	ha	1000	All blocks	2381	23.81	2400	24.00	2590	25.90	2780	27.80	2970	29.70	13121	131.21
12	Cropping system based demonstration	Ha	12500	All blocks except B5, B6, B7, B8	686	85.75	990	123.75	1170	146.25	1350	168.75	1530	191.25	5726	715.75
13	Distribution of weedicide	Ha	1000	All blocks except B10	180	1.80	770	7.70	956	9.56	1144	11.44	1340	13.40	4390	43.90
14	Plant Protection Chemicals	Ha	1000	All blocks	9440	94.40	10985	109.85	11020	110.20	11040	110.40	11060	110.60	53545	535.45
	Total					**5988.51**		**7877.70**		**6706.49**		**6879.20**		**8600.09**		**36051.99**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.4. Enhancing oilseeds productivity

Oilseed forms a major part of the agricultural produces. Oilseeds crops are cultivated under rain fed conditions, their productivities are lesser. However as their outputs fetch higher prices in the market; farmers could get more income, if they could obtain more yield from oilseed crop. Therefore, it is necessary to provide the needed assistance to the farmers by way of subsidized inputs and promotion of technology. In vilupuram district oilseeds are grown in an area of 48,198 ha. The yield is around 3.2 tonnes/ha for groundnut, 732 kg for gingelly and 1.7 tonnes/ha for sunflower. With a view to bring more area under oilseeds and to encourage more farmers to take up groundnut and gingelly cultivation. It is essential that interventions should be targeted on foliar spray and incentives. The overall goal is to increase the yield of oil seeds up to 5 percent through the use of quality seeds along with the adoption of the recommended practices.

Project Components

a) Purchase of breeder seeds
b) Purchase of herbicide
c) CBD- Groundnut
d) Production of Foundation and Certified seeds
e) Distribution of certified seeds
f) Application of gypsum to groundnut crop
g) Distribution of bio fertiliser,liquid bio fertiliser, and light traps.

Budget

The budget requirement for fulfilling the various interventions is ₹ **38110.46** Lakhs. The details of budget requirement for each intervention across the blocks is given in table 4.4.

Expected outcome

The supply of good quality seeds, bio-fertilizers and promotion of intercropping with pulses will enhance the production and productivity of oilseeds

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.4. Budget requirement for oilseeds

(₹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
	OIL SEEDS															
1	Purchase of Breeder seeds	MT	1.50	All blocks	73	109.50	600	900.00	675	1012.50	751	1126.50	825	1237.50	2924	4386.00
2	Herbicide	Ha	0.01	All blocks	761	7.61	950	9.50	970	9.70	988	9.88	1000	10.00	4669	46.69
3	Compact Block Demonstration-Groundnut	Ha	0.20	All blocks	429	85.80	532	106.40	642	128.40	732	146.40	848	169.60	3183	636.60
4	Microirrigation (Raingun / Microsprinkler)	ha	0.55	All blocks	250	137.50	250	137.50	200	110.00	150	82.50	75	41.25	925	508.75
5	Distribution of IPM kit	Nos.	0.10	All blocks	1500	150.00	1000	100.00	1500	150.00	1000	100.00	1500	150.00	6500	650.00
6	Growth regulator / DAP	ha	0.01	All blocks	150	0.75	150	0.75	150	0.75	150	0.75	150	0.75	750	3.75
	GROUNDNUT															
7	Seed Production-Foundation seeds	Mt	0.76	All blocks	180	136.80	232	176.32	281	213.56	329	250.04	376	285.76	1398	1062.48
8	Seed Production -certified seeds	Mt	0.73	All blocks	4243	3097.39	4450	3248.50	4615	3368.95	4845	3536.85	4935	3602.55	23088	16854.24
9	Distribution of Certified seeds	Mt	0.84	All blocks	2865	2406.60	3194	2682.96	3288	2761.92	3402	2857.68	3610	3032.40	16359	13741.56
10	Application of Gypsum to Groundnut Crop	Ha	0.02	All blocks	763	12.21	942	15.07	1122	17.95	1322	21.15	1502	24.03	5651	90.41
11	Distribution of Biofertilizer	Ha	0.01	Gingee, Koliyanur, Vikravandi	747	4.48	800	4.80	800	4.80	800	4.80	800	4.80	3947	23.68
12	Distribution of Liquid Biofertilizer	Ha	0.01	All blocks	2976	17.86	3135	18.81	3280	19.68	3340	20.04	3530	21.18	16261	97.57
13	Distribution of Light Traps	Nos.	0.02	Vikravandi	25	0.50	0	0.00	30	0.60	0	0.00	35	0.70	90	1.80

Sl. No	Interventions	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
14	Castor as Bund crop @ Rs. 600/Ha – for 10 Ha per year.	Ha	0.01	All blocks	194	1.16	228	1.37	237	1.42	242	1.45	255	1.53	1156	6.93
	Grand Total					**6168.16**		**7401.98**		**7800.23**		**8158.04**		**8582.05**		**38110.46**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.5. Enhancing cotton productivity

Cotton is the most important fibre crop of India. It provides the basic raw material (cotton fibre) to cotton textile industry. Its seed (binola) is used in Vanaspati industry and can also be used as part of fodder for milch cattle to get better milk. Cotton crops are grown in an area of 9737 ha and the yield of lint is around 402kg/ ha in Villupuram district. Kallakurichi block is the major cotton growing blocks in Villupuram district. The lint yield of cotton will be increased up to 450-500 kg/ha by the adoption of improved package of practices by the farmers with the use of quality seeds, water management, and marketing infrastructure and processing. Thus the overall goal is to increase the yield and production of cotton crop through the project components.

Project components

a) Distribution of micronutrient mixture
b) Distribution of bio-fertilizers, bio-pesticides/bio agents and
c) Distribution of plant protection chemicals

Budget

The budget requirement for fulfilling the various interventions is ₹**96.36** Lakhs. The details of budget requirement for each intervention across the blocks is given in table 4.5.

Expected Outcome

The implementation of the project will result in an increase of 10 per cent in the yield and production of cotton. This will help the textile units and to supply more raw material for their products.

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.5 Budget Requirement for Cotton

(₹in lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Distribution of biofertilizer	Ha	300	B5, B6, B7, B9, B10, B12, B20, B21 and B22	200	0.60	500	1.50	630	1.89	750	2.25	840	2.52	2920	8.76
2	Distribution of biopesticides / Bio agents	Ha	1000	B5, B6, B7, B9, B10, B12, B20, B21 and B22	200	2.00	500	5.00	630	6.30	750	7.50	840	8.40	2920	29.20
3	Distribution of MN Mixture	Ha	1000	B5, B6, B7, B9, B10, B12, B20, B21 and B22	200	2.00	500	5.00	630	6.30	750	7.50	840	8.40	2920	29.20
4	Distribution of PP chemicals	Ha	1000	B5, B6, B7, B9, B10, B12, B20, B21 and B22	200	2.00	500	5.00	630	6.30	750	7.50	840	8.40	2920	29.20
	Grand total					**6.60**		**16.50**		**20.79**		**24.75**		**27.72**		**96.36**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.6. Enhancing sugarcane productivity

In Villupuram district Sugarcane is the predominant crop next to rice. Sugarcane is cultivated in around 84,247haoccupying 4.7% of the total area under all crops. In the district total yield of sugarcane is around 119 tonnes/ha. Non availability of quality seed materials, slower adoption of Sustainable Sugarcane Initiative (SSI) techniques and red rot infection are the major issues with regard to sugarcane cultivation. More labour and water is being spent for raising this crop. Moisture conservation and minimizing the water usage must be given preference to motivate the farmers in bringing more area under sugarcane.Farmers should be encouraged to followSSI techniques and Trash mulching for improving soil fertility status, increase water use efficiency,weed control and increase productivity of sugarcane. Thus the overall objective is to increase the yield of sugarcane by 5-10 percent/ha through the implementation of SSI and trash mulching techniques.

Project components

a) Distribution of single bud seedling for sustainable sugarcane initiative (SSI)
b) Establishment of shade net for SSI
c) Distribution of sugarcane booster , sugarcane chip cutter, gypsum, bio fertilizer, iron sulphate, water soluble fertilizers
d) Distribution of parasite *Trichogramma*
e) Demonstration on intercropping in sugarcane and Trash mulching under SSI
f) Distribution of Drip components

Budget

The budget requirement for fulfilling the various interventions is ₹ **31051.72** Lakhs. The details of budget requirement for each intervention across the blocks is given in table 4.6.

Expected outcome

Trash mulching techniques will improve the soil heath and nutrient status. Hence assurance of nutritional sustainability will be kept. 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 4.6. Budget requirement for sugarcane

(₹in lakhs)

Sl. No	Sugarcane	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Distribution of Gypsum (500 Kg/Ha)	Ha	0.02	All blocks	0	0.00	4000	80.00	4000	80.00	4000	80.00	4000	80.00	16000	320.00
2	Distri. of biofertilizer (Ha)	Ha	0.006	All blocks	0	0.00	4000	24.00	4000	24.00	4000	24.00	4000	24.00	16000	96.00
3	Distribution of Chip Cutter	Nos	0.05	All blocks	238	11.90	600	30.00	600	30.00	600	30.00	600	30.00	2638	131.90
4	Distribution of FeSO4 Spray	Ha	0.005	All blocks	0	0.00	4000	20.00	4000	20.00	4000	20.00	4000	20.00	16000	80.00
5	Distribution of Micro Nutrient Mixture	Ha	0.02	All blocks	0	0.00	4000	80.00	4000	80.00	4000	80.00	4000	80.00	16000	320.00
6	Distribution of Parasite Trichogramma	Ha	0.00125	All blocks	0	0.00	4000	5.00	4000	5.00	4000	5.00	4000	5.00	16000	20.00
7	Distribution of Sugarcane Booster (10 Kg/Ha)	Ha	0.035	All blocks	0	0.00	1000	35.00	1000	35.00	1000	35.00	1000	35.00	4000	140.00
8	Distribution of Water Soluble Fertiliers	ha	0.25	B22	14	3.50	20	5.00	25	6.25	28	7.00	30	7.50	117	29.25
9	Micro irrigation - Drip (1.2x0.6)	ha	1.24	All blocks	2886	3578.64	4650	5766.00	4700	5828.00	4850	6014.00	4870	6038.80	21956	27225.44
	Sustainable Sugarcane Initiative (SSI)															
10	A. Establishment of Shadenet	Nos	1.5	All blocks	516	774.00	72	108.00	80	120.00	85	127.50	108	162.00	861	1291.50
11	Distribution of Single Bud Seedling	Ha	0.225	All blocks	1755.6	395.01	481	108.23	492	110.70	621	139.73	627	141.08	3976.6	894.75
12	Trash Mulching	Ha	0.04	All blocks	0	0.00	2000	80.00	2000	80.00	2000	80.00	2000	80.00	8000	320.00
13	Demonstration on intercropping in Sugarcane	Ha	0.08	All blocks	46	3.68	520	41.60	550	44.00	580	46.40	590	47.20	2286	182.88
	Grand Total					**4766.73**		**6382.83**		**6462.95**		**6688.63**		**6750.58**		**31051.72**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.7. Enhancing Coconut Cultivation

The coconut palm exerts a profound influence on the rural economy of the many states where it is grown extensively and it provides sustenance to more than 10 million people. The processing and related activities centered on the crop generate employment opportunities for over two million people in India. Coconut was grown in an area of 1755 ha in all blocks of Villupuram district and the yield is around 10,730 nuts/ ha. Coconut is propagated by nuts and planting in dry areas. The cultural operations are very difficult because of its tall growing nature. Hence the introduction of high yielding hybrids (Tall × Dwarf) would add profit and increase the numbers and productivity of coconut trees. There is scope for increasing the area under coconut in Villupuram district by developing improved tall varieties or hybrids.

Project components

a) Distribution of Tall x Dwarf seedlings
b) Distribution of Tall seedlings
c) Distribution of micro nutrient mixture , pheromone traps and drip components
d) Intercropping with green manures
e) Corpus fund release for FPG
f) Distribution of coconut seedlings to school children
g) Control of Eriophid mite
h) Replanting and rejuvenation of coconut gardens
i) Demonstration on integrated fertilizer management

Budget

The total cost of the project for five years works to **₹12146.91** Lakhs. The details of budget requirement for each intervention across the blocks

Expected outcome

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

Implementing agency

The projects will be implemented by the Department of Agriculture.

Table 4.7. Budget requirement for coconut

(₹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 except B6, B9, B10, B12, B20 and B21	2400	1.56	2800	1.68	2800	1.68	2800	1.68	2800	1.68	13800	8.28
2	Distribution of Tall Seedlings	No	0.0004	All blocks except B6, B9, B10, B12, B20 and B21	12670	5.07	7000	2.80	7000	2.80	7000	2.80	7000	2.80	40670	16.27
3	Distribution of MN mixture	Ha	0.1	All blocks except B6 and B21	0	0.00	900	90.00	900	90.00	900	90.00	900	90.00	3600	360.00
4	Distribution of Pheromone traps for Red palm weevil/ Rhinocerous beetle	Ha	0.016	All blocks except B6 and B21	480	7.68	680	10.88	680	10.88	680	10.88	680	10.88	3200	51.20
5	Drip irrigation	Ha	0.35	All blocks except B6 and B21	0	0.00	90	31.50	90	31.50	90	31.50	90	31.50	360	126.00
6	Intercropping with green manures	Ha	0.03	All blocks except B6 and B21	0	0.00	900	27.00	900	27.00	900	27.00	900	27.00	3600	108.00
7	Management of Black headed caterpillar	Ha	0.05	All blocks except B6 and B21	0	0.00	180	9.00	180	9.00	180	9.00	180	9.00	720	36.00
8	Replanting and rejuvenation of coconut grden	Ha	0.45	All blocks except B6 and B21	0	0.00	360	162.00	360	162.00	360	162.00	360	162.00	1440	648.00
9	Demonstration on Integrated fertiliser management	Ha	0.75	All blocks except B6 and B21	0	0.00	180	135.00	180	135.00	180	135.00	180	135.00	720	540.00
10	Distribution of coconut seedlings to school children	No	0.0004	All blocks except B6 and B21	0	0.00	1800	0.72	1800	0.72	1800	0.72	1800	0.72	7200	2.88
11	Control of Eriophid mite	no. of tree	0.0002	B1, B5, B7, B8, B12, B13, B16, B19 and B20	0	0.00	360	0.07	360	0.07	360	0.07	360	0.07	1440	0.28
12	corpus fund release for FPG (2000 nos.)	Nos.	5	All blocks except B6 and B21	430	**2150.00**	344	**1720.00**	400	2000.00	416	**2080.00**	460	2300.00	2050	10250.00
	Grand Total					**2164.31**		**2190.65**		**2470.65**		**2550.65**		**2770.65**		**12146.91**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.8. Enhancing the livelihood of farmers through trainings

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

Project components

a) Training extension functionaries with respect to paddy, major and minor millets, pulses, sugarcane. cotton, groundnut and oilpalm
b) Training extension functionaries with respect to IFS, moisture conservation practices, value addition trainings , organic cultivation practices and awareness campaigns
c) Interstate training to farmers
d) Training of 536 groups of seed village farmers in quality seed production technology
e) Training of farmer under mission soil health card
f) Within the district training and exposure visits of farmers
g) Within the state trainings for farmers
h) Trainings for farmers within the district with respect to IFS, organic cultivation,paddy, sugarcane and value addition
i) Exposure visit of farmers with respect to rodent pest management demonstration
j) Organisation of kisangothies on soil test based nutrient application

Budget

It is proposed to incur ₹.**2286.4** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

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

Implementing Agency

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

Table 4.8. 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
I	**Training Extension Functionaries**															
1	Paddy	Nos.	0.9	All blocks except B7	9	8.10	20	18.00	20	18.00	20	18.00	20	18.00	89	80.10
2	Major & Minor Millets	Nos.	0.9	All blocks except B7	13	11.70	20	18.00	20	18.00	20	18.00	20	18.00	93	83.70
3	Pulses	Nos.	0.9	All blocks	16	14.40	20	18.00	20	18.00	20	18.00	20	18.00	96	86.40
4	Sugarcane	Nos.	0.9	All Blocks except B16, B17, B18, B19, B20, B21, B22	6	5.40	13	11.70	13	11.70	13	11.70	13	11.70	58	52.20
5	Cotton	Nos.	0.9	B16, B17, B18, B19, B20, B21, B22	3	2.70	7	6.30	7	6.30	7	6.30	7	6.30	31	27.90
6	Groundnut	Nos.	0.9	All blocks	9	8.10	20	18.00	20	18.00	20	18.00	20	18.00	89	80.10
7	oil Palm		0.9	All blocks	9	8.10	20	18.00	20	18.00	20	18.00	20	18.00	89	80.10
8	IFS	Nos.	0.9	All blocks	9	8.10	20	18.00	20	18.00	20	18.00	20	18.00	89	80.10
9	Moisture conservation practices	Nos.	0.9	All blocks	9	8.10	20	18.00	20	18.00	20	18.00	20	18.00	89	80.10
10	Value addition training		0.9	All blocks	9	8.10	20	18.00	20	18.00	20	18.00	20	18.00	89	80.10
11	Organic cultivation practices	Nos.	0.9	All blocks	96	86.40	223	200.70	223	200.70	223	200.70	223	200.70	988	889.20
12	Awareness campaigns		0.01	All Blocks except B16, B17, B18, B19, B20, B21, and B22	180	1.80	390	3.90	390	3.90	390	3.90	390	3.90	1740	17.40

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
	District Level															
	Training of Farmers															
13	Inter State Training of Farmers	Nos.	1.25	All Blocks except B16, B17, B18, B19, B20, B21, and B22	13	16.25	13	16.25	13	16.25	13	16.25	13	16.25	65	81.25
14	Inter State Training of Farmers	Nos.	1.75	B16, B17, B18, B19, B20, B21, and B22	7	12.25	7	12.25	7	12.25	7	12.25	7	12.25	35	61.25
15	Training of 536 Groups of Seed Village Farmers in quality Seed Production technology.	Nos.	0.1	All blocks	40	4.00	40	4.00	40	4.00	40	4.00	40	4.00	200	20.00
16	Training of Farmers under Mission Soil Health Card	Nos.	0.15	All blocks	20	3.00	20	3.00	20	3.00	20	3.00	20	3.00	100	15.00
17	With in the district training of Farmers	Nos.	0.1	All blocks	20	2.00	40	4.00	40	4.00	40	4.00	40	4.00	180	18.00
18	With in the State training of Farmers	Nos.	1.2	All blocks	20	24.00	20	24.00	20	24.00	20	24.00	20	24.00	100	120.00
	Training of Farmers With in the district															
19	IFS	Nos.	0.1	B16, B17, B18, B19, B20, B21, and B22	7	0.70	7	0.70	7	0.70	7	0.70	7	0.70	35	3.50
20	Organic cultivation practices	Nos.	0.1	B16, B17, B18, B19, B20, B21, and B22	7	0.70	7	0.70	7	0.70	7	0.70	7	0.70	35	3.50
21	Paddy	Nos.	0.1	B16, B17, B18, B19, B20, B21, B22	7	0.70	7	0.70	7	0.70	7	0.70	7	0.70	35	3.50
22	Sugarcane	Nos.	0.1	B16, B17, B18, B19, B20, B21, and B22	7	0.70	7	0.70	7	0.70	7	0.70	7	0.70	35	3.50

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
23	Value addition training	Nos.	0.1	B16, B17, B18, B19, B20, B21, and B22	7	0.70	7	0.70	7	0.70	7	0.70	7	0.70	35	3.50
	Exposure visit of Farmers		0.4	B16, B17, B18, B19, B20, B21, and B22	7	2.80	7	2.80	7	2.80	7	2.80	7	2.80	35	14.00
24	Rodent Pest Management Demonstration	Nos.	0.04	All blocks except B22	130	5.20	130	5.20	130	5.20	130	5.20	130	5.20	650	26.00
25	With in State Exposure visit	Nos.	0.4	All blocks	27	10.80	27	10.80	27	10.80	27	10.80	27	10.80	135	54.00
26	Organisation of Kisangosthies on Soil test based nutrient application (Campaign)	Nos.	0.15	All blocks	200	30.00	200	30.00	200	30.00	200	30.00	200	30.00	1000	150.00
27	With in the district exposure visit	Nos.	0.15	All blocks	96	14.40	96	14.40	96	14.40	96	14.40	96	14.40	480	72.00
	TOTAL					**299.2**		**496.8**		**496.8**		**496.8**		**496.8**		**2286.4**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.9. Infrastructure development

Facilities for Seed production

Seed is the most basic input in agriculture. Therefore, the sustained supply of the quality seeds will continue to be a key factor for augmenting agricultural growth. The seed processing is a vital part of the seed production activities and the State Government has accorded high priority. In view of above, efforts have to be taken with the objective of production of quality seeds of agricultural crops through scientific methods andadopting 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 suchmaterial is said to be substandard. Quality control laboratories are being established by the Government with an intention to supply quality inputs *viz*., seed, fertilizers andpesticide and services like soil testing to the farmers. To have effective quality control of inputs, quality inspectors are to be appointed.

The major interventions are

a) Additional Seed Godown
b) Construction of IAEC with vehicle shed and compound wall
c) Construction of Lignite storage/ storage Godowns
d) Construction of Sub-AEC
e) Establishment of Thrashing floor/drying yard

Budget

It is proposed to incur ₹. **3900** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

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

Implementing Agency

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

Table 4.9 Budget Requirement for Agriculture Sector in Infrastructure

(Rs. 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	Additional Seed Godown	Nos.	1250000	All blocks	0	0.00	40	500.00	0	0.00	0	0.00	0	0.00	40	500.00
2	Construction of Integrated Agricultural Extension Centre with vehicle shed and compound wall	Nos.	25000000	Vikravandi	1	250.00	0	0.00	0	0.00	0	0.00	0	0.00	1	250.00
3	Construction of Sub-Agricultural Extension Centre (498 Nos.)	Nos.	3000000	All blocks	0	0.00	20	600.00	0	0.00	0	0.00	0	0.00	20	600.00
4	Establishment of Thrashing floor/ drying yard	Nos.	500000	All blocks	0	0.00	100	500.00	100	500.00	100	500.00	100	500.00	400	2000.00
5	Strengthening of training institute / nursery / FTC / KVK	Nos.	50000000	All Blocks	0	0.00	0	0.00	0	0.00	1	500.00	0	0.00	1	500.00
6	Infrastructure for empowerment of coconut nurseries	Nos.	5000000	All Blocks	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00	1	50.00
	Grand Total					**250.00**		**1600.00**		**550.00**		**1000.00**		**500.00**		**3900.00**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.10. 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

a) Reclamation of alkali soils
b) Establishment of HDPE vermicompost units
c) Green manuring
d) Distribution of soil health card

Budget

Enhancing soil health by distributing enriched farm yard manure, micro-nutrient mixture, gypsum, bio-fertilizers, *etc.* is essential to maximize profitability. The overall budget to undertake the various interventions in this district is ₹.**3985.62** lakhs.

Expected Outcome

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

Implementing Agency

The projects will be implemented by the Department of Agriculture.

Table 4.10.Budget Requirement for Agriculture Sector in Soil Health Management

Finance Rs. in lakhs

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	HDPE Vermi compost units	Kit Nos	12000	All blocks	0	0.00	100	12.00	100	12.00	100	12.00	100	12.00	400	48.00
2	Reclamation of Alkali Soil	MT	50000	All blocks	0	0.00	1000	500.00	1000	500.00	1000	500.00	1000	500.00	4000	2000.00
3	Green Manuring	Nos	4000	All blocks	150	6.00	10000	400.00	10000	400.00	10000	400.00	10000	400.00	40150	1606.00
4	Distribution of Soil Health Card	Ha	300	All blocks	56220	168.66	54320	162.96	0	0.00	0	0.00	0	0.00	110540	331.62
	Total					**174.66**		**1074.96**		**912**		**912**		**912**		**3985.62**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.11. Integrated Pest Management (IPM)

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

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

Interventions

1. Farmers Field Schools (FFS)
2. Field days

Budget

It is proposed to incur ₹. **64.00** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

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

Implementing Agency

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

Table 4.11.Budget Requirement for Agriculture Sector in Integrated Pest Management

Finance Rs. 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	Farmers Field Schools (FFS)	Nos.	0.2	All blocks	0	0	40	8.00	40	8.00	40	8.00	40	8.00	160	32.00
2	Field days	No.	0.2	All blocks	0	0	40	8.00	40	8.00	40	8.00	40	8.00	160	32.00
	Grand Total					**0.00**		**16.00**		**16.00**		**16.00**		**16.00**		**64.00**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.12. 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 Villupuram district.

Project Component:

- Distribution of tractors, mini tractors, power tillers and chaff cutters
- Distribution of mobile sprinklers, rain guns and PVC Pipes to carry irrigation water from source to field
- Distribution of Solar light traps
- Distribution of sprayers (power, hand and battery operated sprayer)
- Distribution of Tarpaulins and rotavators
- Distribution of weeders (cono weeder and rotary power weeder)

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 ₹.**14793.48** lakhs.

Expected Outcome:

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

Implementing Agency:

The projects will be implemented by the Department of Agriculture.

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Table 4.12.Budget Requirement for Agriculture Sector in Farm Machineries

Finance Rs. 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	Solar light trap	No.	0.04	All blocks	957	38.28	1000	40.00	1000	40.00	1000	40.00	1000	40.00	4957	198.28
2	Power operated sprayer	Nos.	0.08	All blocks	236	18.88	1200	96.00	1300	104.00	1400	112.00	1500	120.00	5636	450.88
3	Hand operated sprayer	Nos.	0.02	All blocks	0	0.00	600	9.00	600	9.00	600	9.00	600	9.00	2400	36.00
4	Battery operated sprayer	Nos.	0.04	All blocks	13	0.52	1200	48.00	1200	48.00	1200	48.00	1200	48.00	4813	192.52
5	Distribution of Tarpaulins	Nos	0.08	All blocks	200	16.00	1200	96.00	1200	96.00	1200	96.00	1200	96.00	5000	400.00
6	Distribution of Rotavator	Nos	0.80	All blocks	42	33.60	600	480.00	700	560.00	800	640.00	900	720.00	3042	2433.60
7	Distribution of Tractor	Nos	6.00	All blocks	0	0.00	120	720.00	120	720.00	120	720.00	120	720.00	480	2880.00
8	Distribution of Power tiller	Nos	1.50	All blocks	51	76.50	400	600.00	500	750.00	600	900.00	700	1050.00	2251	3376.50
9	Distribution of Mini Tractor	Nos	3.00	All blocks	0	0.00	120	360.00	120	360.00	120	360.00	120	360.00	480	1440.00
10	Distribution of chaff cutter	Nos	0.25	All blocks	0	0.00	120	30.00	120	30.00	120	30.00	120	30.00	480	120.00
11	PVC Pipes to carry Irrigation water from source to field	Unit	0.40	All blocks	160	64.00	1200	480.00	1200	480.00	1200	480.00	1200	480.00	4960	1984.00
12	Distribution of Mobile Sprinklers	Ha	0.30	All blocks	5	1.50	240	72.00	240	72.00	240	72.00	240	72.00	965	289.50
13	Distribution of Rain guns	Ha	0.40	All blocks	0	0.00	120	48.00	120	48.00	120	48.00	120	48.00	480	192.00
14	Distribution of Power Weeder	Nos	0.65	All blocks	0	0.00	240	156.00	240	156.00	240	156.00	240	156.00	960	624.00
15	Distribution of conoweeder	No	0.02	All blocks	0	0.00	2090	41.80	2165	43.30	2240	44.80	2315	46.30	8810	176.20
	Grand Total					**249.28**		**3276.80**		**3516.30**		**3755.80**		**3995.30**		**14793.48**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

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

Role of IT in Agriculture

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

Components

It includes input devices, output devices, processors, storage devices, software, networking devices, transmission media and other accessories.

Budget

It is proposed to incur ₹.**252.54** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

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

Implementing Agency

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

Table 4.13. Budget for interventions in Information Technology

(₹. in lakhs)

Sl. No	Components	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Procurement of Hardware for replacement of old hardware	Nos	50000	B16, B17, B18, B19, B20, B21, and B22	0	0	7	3.50	0	0	0	0	7	3.50	14	7.0
2	Connectivity Charges	Nos	11000	B16, B17, B18, B19, B20, B21, and B22	0	0	7	0.77	0	0	0	0	7	0.77	14	1.54
3	Printer cum Scanner	Nos	20000	All Blocks except B16, B17, B18, B19, B20, B21, B22	0	0	20	4.00	0	0	0	0	20	4.00	40	8.0
4	UPS and Electrical Accessories	Nos	35000	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	40	14.00	0	0	0	0	40	14.00	80	28.0
5	Xerox machine	Nos	75000	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	20	15.00	0	0	0	0	20	15.00	40	30.0
6	Laptop/Desktop	Nos	50000	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	40	20.00	0	0	0	0	40	20.00	80	40.0
7	Anti -virus software	Nos	2500	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	100	2.50	0	0	0	0	100	2.50	200	5.0
8	Television	Nos	100000	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	20	20.00	0	0	0	0	20	20.00	40	40.0
9	Colour printer	Nos	15000	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	20	3.00	0	0	0	0	20	3.00	40	6.0
10	4G Internet - Dongle	Nos	2500	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	100	2.50	0	0	0	0	100	2.50	200	5.0
11	**Equipments for Documentation**															
a	Handycam	Nos	30000	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	20	6.00	0	0	0	0	20	6.00	40	12.0
b	Camera	Nos	25000	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	20	5.00	0	0	0	0	20	5.00	40	10.0
c	GPS instrument	Nos	20000	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	20	4.00	0	0	0	0	20	4.00	60	8.0
d	Android mobile	Nos	15000	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	40	6.00	0	0	0	0	40	6.00	140	12.0
e	External Hard disk	Nos	5000	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	100	5.00	0	0	0	0	100	5.00	100	10.0
	LCD projector	Nos	75000	All Blocks except B16, B17, B18, B19, B20, B21, and B22	0	0	20	15.00	0	0	0	0	20	15.00	20	30.0
	Total					**0**		**126.27**		**0**		**0**		**126.27**		**252.54**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.14. 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. 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 as well there is a need to promote oil palm by the way of area expansion and better cultivation practices, it is equally important to focus on innovative growth strategies through National Mission on Oilseeds and Oil Palm (NMOOP) has been launched in which Mini Mission-II (MM-II) is dedicated to oil palm area expansion and productivity increases. MM-II of NMOOP and MM-III of NMOOP is being implemented in 13 States viz; Tamil Nadu, Andhra Pradesh, Assam, Arunachal Pradesh, Chhattisgarh, Gujarat, Karnataka, Kerala, Mizoram, Nagaland, Odisha, Telangana, and West Bengal.

Project components

- Oil palm area expansion programme
- Inputs for intercropping
- Supply of diesel pumps
- Supply of aluminium ladder, wire mesh and oil palm cuter

Budget

It is proposed to incur ₹.**685.06** lakhs over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

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

Implementing Agency

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

Table 4.14. Budget requirement for Oilpalm

(₹. 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	NMOOP -Mini Mission -II (Oilpalm)															
2	Oilpalm Area Expansion Programme	Ha	0.14	All blocks	162	22.68	248	34.72	322	45.08	398	55.72	476	66.64	1606	224.84
3	Cultivation maintenance	Ha	0.1	All blocks	215	21.50	326	32.60	394	39.40	468	46.80	534	53.40	1937	193.70
4	Inputs for Intercropping	Ha	0.1	All blocks	235	23.50	339	33.90	417	41.70	484	48.40	555	55.50	2030	203.00
5	Supply of Diesel pumps	No	0.3	B2, B3, B5, B7, B10, B16, B22	5	1.50	18	5.40	18	5.40	18	5.40	18	5.40	77	23.10
6	Motorised Chisel	No	0.2	All blocks except B9, B12,B20	8	1.60	17	3.40	18	3.60	18	3.60	18	3.60	79	15.80
7	Alumium portable ladder	No	0.06	B7	1	0.06	0	0.00	0	0.00	0	0.00	0	0.00	1	0.06
8	Wire mesh	No	0.1	All blocks except B8, B9, B12, B19, B20	16	1.60	33	3.30	34	3.40	50	5.00	50	5.00	183	18.30
9	Oilpalm Cutter	No	0.03	B1, B7, B8, B10, B13, B14,B22	3	0.09	4	0.12	5	0.15	5	0.15	5	0.15	22	0.66
	NMOOP -Mini Mission -III (Tree Borne Oilseeds)															
10	Cultivation maintenance	Ha	0.05	B6 and B21	8	0.40	20	1.00	24	1.20	28	1.40	32	1.60	112	5.60
	Total					**72.93**		**114.44**		**139.93**		**166.47**		**191.29**		**685.06**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.1.15. Rainfed Area Development

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

Project components

- Milch Animal (1 no) + 1 ha cropping system with inter crop & border plantation like castor/sesbania etc.

Budget

It is proposed to incur **₹27.5** lakh over a period of five years with the finance facilities under the NADP and other sources.

Expected outcome

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

Implementing Agency

Department of Agriculture will implement the project and report the progress to the District-level officials. The projects will be implemented by the Department of Agriculture. The progress of the project will be monitored by Director of Agriculture and Joint Director of Agriculture.

Table 4.15. Budget requirement for Rainfed Area Development

(₹. in lakhs)

Sl. No	Interventions	Unit	Unit Cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Milch Animal (1 no) + 1 ha cropping farming system (Cropping system with inter crop & border plantation like castor/sesbania etc.) @ Rs.27500/ as subsidy per Unit	Ha	0.55	B22	0	0	50	27.5	0	0	0	0	0	0	50	27.5
	Grand Total					**0**		**27.5**		**0**		**0**		**0**		**27.5**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

Table 4.16.Consolidated Budget Abstract for Agriculture Sector

(Rs. in lakhs)

Sl. No	Crops	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Paddy	693.76	1343.31	1585.25	1806.42	2003.56	7432.30
2	Millet	75.22	126.20	162.84	194.32	227.18	785.76
3	Pulses	5988.51	7877.70	6706.49	6879.20	8600.09	36051.99
4	Oilseeds	6168.16	7401.98	7800.23	8158.04	8582.05	38110.46
5	Oilpalm	72.93	114.44	139.93	166.47	191.29	685.06
6	Cotton	6.60	16.50	20.79	24.75	27.72	96.36
7	Sugarcane	4766.73	6382.83	6462.95	6688.63	6750.58	31051.72
8	Coconut	2164.31	2190.65	2470.65	2550.65	2770.65	12146.91
9	Training	299.20	496.80	496.80	496.80	496.80	2286.40
10	Infrastructure	250.00	1600.00	550.00	1000.00	500.00	3900.00
11	Soil Health Management	174.66	1074.96	912.00	912.00	912.00	3985.62
12	Rainfed Area Development	0.00	27.50	0.00	0.00	0.00	27.50
13	Integrated Pest Management	0.00	16.00	16.00	16.00	16.00	64.00
14	Farm Mechanization	249.28	3276.80	3516.30	3755.80	3995.30	14793.48
15	Agriculture Information Technology	0.00	126.27	0.00	0.00	126.27	252.54
	Grand total	**20909.36**	**32071.94**	**30840.23**	**32649.08**	**35199.49**	**151670.10**

4.2. Research infrastructure and development

The major thrust were given on creation of infrastructure facilities for enhancing the productivity of major crops grown in the State, creation of value addition facilities, skill development through hands-on training to farmers and women and advanced photosynthetic analytic laboratory.

Interventions

a) Establishment of advanced photosynthetic analytical laboratory

b) Construction of farmers trainees hostel

Overall budget

The projects on research infrastructure and development will be implemented with a budget out lay of Rs**. 581.00** lakhs**.**

Project implementing agency

The projects will be implemented by Tamil Nadu Agricultural University in the various colleges and research stations. The progress of the projects will be monitored/reviewed by the Vice-Chancellor and Director of CARDS, Nodal officer once in a year**.**

Project outcome

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

Table 4.17.Budget for Research Infrastructure Requirement for Villupuram district

(Rs.in lakhs)

Sl. No.	Interventions	Blocks Covered	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	**Research Infrastructure**														
1	Establishment of Advanced Photosynthetic analytic laboratory	Tindivanam	300	0	0	1	300.00	0	0	0	0	0	0	1	300.00
2	Construction of Farmers Trainees Hostel	Tindivanam	200	0	0	1	200.00	0	0	0	0	0	0	1	200.00
3	Organic vegetable production	Tindivanam	26	1	26	0	0	0	0	0	0	0	0	**1**	**26**
4	Strengthening of department laboratories	Tindivanam	5	1	5	0	0	0	0	0	0	0	0	**1**	**5**
5	Advanced grain quality analysis laboratory	Tindivanam	50	0	0	0	0	0	0	1	50	0	0	**1**	**50**
	Total			**2**	**31**	**2**	**500**	**0**	**0**	**1**	**50**	**0**	**0**	**5**	**581**

4.3. HORTICULTURE

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

Area expansion of Horticultural crops

Fruit Crops

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

Vegetable crops

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

Flower crops

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

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.

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 grown in the district include include coffee, coconut, arecanut, cashew, and betel vine. So the promotion of cultivation of plantation crops will increase the economy of the farmer and also Indian economy.

Rejuvenation of Old Orchards – Mango and Cashew

In general, old 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 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.

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

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

Bee keeping for pollination

Production of apiary honey in the country reached 10,000 tons, valued at about Rs.300 million. Bee-Keeping Industry is one of the important activities. The Government provides financial support to this Industry by way of providing grant for supply of bee-hives to the Tribal on hill areas, Scheduled Castes /Scheduled Tribes under Western Ghats Development Programmes, Hill Area Development Programme and Integrated Tribal Development

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

Protected cultivation

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

Establishment of Mushroom unit

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

Vermicomposting unit

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

Supporting structures for vegetable production

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

Post-harvest management

Temperature management is most effective tool for maintaining quality and safety and for extending the post-harvest life of fresh horticultural commodities. It begins with the rapid removal of field heat by initial cooling and continuous throughout the cold chain (cold storage), refrigerated transportation, refrigerated retail display and cold storage at wholesale distribution. In order to reduce the post-harvest losses its necessary to establishing Pack house (9m X 6m),Low cost onion structure 25 mt, Drying yard and Market intervention -Mobile vending cart.

Mechanization

Farm mechanization has been helpful to bring about significant improvement in horticulture productivity by bridging the demand- supply gap of farm workers. Thus the main objective is to supply the horticulture machinery/implements such as Power Tillers (8BHP and above), Mini Tractors, Tractor Land development, tillage and seed bed preparation equipments, Manual Sprayers - Knapsack/Foot operated Sprayers, Tractor Mounted / Operated Sprayers (Below 20HP), Tractor Mounted / Operated Sprayer (Above 20HP),Post Hole Digger/Augur, Pneumatic/ other Planters, Mulch laying machines, Hand operated sprayers with face mask, Nets for safe harvesting of fruits & Headlights for flower picking, Power operated Sprayer, Plastic crates for vegetable & fruits handling,5 layered Polythene spread sheets for drying horticulture produce Aluminium Ladders for Harvesting Equipments for manure management(Motorized Shredder for cutting biomass for making Vermicompost and organic mulching).

Water and irrigation management

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

Capacity building

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

Crop insurance and risk mitigating schemes

Crop insurance played a major role in safe guarding the farmers against any untoward instances. Understanding its importance, the proposed scheme includes crop insurance and risk mitigating schemes.

Budget

The budget requirement for fulfilling the various interventions is₹**78340.32** Lakhs.

Implementing agency

The projects will be implemented by the Department of Horticulture.

Table 4.18 Budget for Horticulture Development

(Rs.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	TC Banana & TC Pineapple	Ha	1.25	All blocks	121	151.25	121	151.25	129	161.25	144	180.00	154	192.50	669	836.25
2	Banana / Hill Banana sucker & Pine apple sucker	Ha	0.875	All blocks	200	175.00	200	175.00	210	183.75	215	188.13	225	196.88	1050	918.76
3	UHDP in Papaya, Mango, Guava, Pomegranate, Acidlime	Ha	1.25	B3,B4,B5,B6,B7,B9,B11,B14,B15,B16,B18	71	88.75	76	95.00	86	107.50	86	107.50	86	107.50	405	506.25
4	HDP in Mango, Guava, Litchi, Pomegranate	Ha	1	All blocks	144	144.00	144	144.00	149	149.00	149	149.00	154	154.00	740	740.00
5	Area expansion fruits with traditional varieties	Ha	0.6	All blocks except B5,B6,B20,B22	61	36.60	61	36.60	61	36.60	61	36.60	61	36.60	305	183.00
6	Normal Planting in lime / lemons	Ha	0.6	All Blocks	65	39.00	65	39.00	65	39.00	68	40.80	68	40.80	331	198.60
7	Normal Planting in Mango	Ha	0.6	All Blocks	164	98.40	169	101.40	164	98.40	164	98.40	164	98.40	825	495.00
8	Normal planting in Guava	Ha	0.6	All blocks except B21	92	55.20	92	55.20	92	55.20	97	58.20	97	58.20	470	282.00
9	Normal planting in Sapota	Ha	0.6	B5,B12,B13,B14,B16,B20	32	19.20	32	19.20	32	19.20	32	19.20	32	19.20	160	96.00
10	Normal planting in Amla	Ha	0.6	B5,B20	58	34.80	63	37.80	58	34.80	59	35.40	59	35.40	297	178.20
11	Normal planting in Papaya	Ha	0.6	All blocks	123	73.80	128	76.80	126	75.60	126	75.60	136	81.60	639	383.40
12	Normal planting in Jack	Ha	0.6	All blocks except B2,B4,B7,B8,B10, B11,B12,B14,B19, B20,B22	34	20.40	34	20.40	34	20.40	35	21.00	35	21.00	172	103.20
13	Normal planting in Pomegranate	Ha	0.6	All blocks except B5,B8,B10,B21	55	33.00	55	33.00	55	33.00	56	33.60	61	36.60	282	169.20

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	Banana for leaf production	Ha	0.6	All blocks except B1,B2,B7,B12, B13,B17,B19, B20,B21,B22	50	30.00	50	30.00	50	30.00	53	31.80	53	31.80	256	153.60
15	Area expansion under Palmyrah,	Ha	0.6	All blocks except B8,B9	15	9.00	15	9.00	15	9.00	15	9.00	15	9.00	75	45.00
16	Commercial production of choice fruits (Kiwi, Mangoosteen, Rambutan, Fig, Date palm, Durian, Carambola, Dragon fruit,Passion Fruit, Kiwi, Grapes, Strawberry, etc.,)	Ha	1.25	All blocks except B5,B6,B7,B8,B 9,B12,B13,B16 ,B17,B20,B22	19	23.75	19	23.75	19	23.75	19	23.75	19	23.75	95	118.75
17	Commercial production of Traditional fruits (Woodapple, Manila Tamarind, Jamun, Ber, Karonda, Annona, Egg fruit, etc.,)	Ha	0.6	All blocks except B5,B7,B8,B12, B13,B16,B17, B20	22	13.20	25	15.00	25	15.00	26	15.60	26	15.60	124	74.40
II	**Area expansion of vegetable crops**															
18	Brinjal	Ha	0.5	All blocks	255	127.50	260	130.00	270	135.00	285	142.50	285	142.50	1355	677.50
19	Bhendi	Ha	0.5	All blocks	255	127.50	255	127.50	265	132.50	265	132.50	275	137.50	1315	657.50
20	Green Chillies	Ha	0.5	All blocks	230	115.00	235	117.50	235	117.50	245	122.50	245	122.50	1190	595.00
21	Tomato	Ha	0.5	All blocks except B5	92	46.00	92	46.00	93	46.50	94	47.00	94	47.00	465	232.50
22	Gourds including pumpkin and tinda	Ha	0.5	All blocks except B21	209	104.50	209	104.50	211	105.50	216	108.00	216	108.00	1061	530.50
23	Peas & Beans	Ha	0.5	All blocks except B5,B14,B19,B22	58	29.00	58	29.00	58	29.00	59	29.50	59	29.50	292	146.00
24	Greens	Ha	0.5	All blocks	131	65.50	131	65.50	131	65.50	136	68.00	141	70.50	670	335.00
25	Small Onion	Ha	0.5	All blocks except B5,B14,B16	471	235.50	476	238.00	531	265.50	534	267.00	584	292.00	2596	1298.00

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.
26	Bellary Onion	Ha	0.5	All blocks except B5,B14,B16	214	107.00	219	109.50	219	109.50	219	109.50	219	109.50	1090	545.00
27	Cauliflower	Ha	0.5	All Blocks	2	1.00	2	1.00	2	1.00	2	1.00	2	1.00	10	5.00
28	Annual Moringa	Ha	0.5	All blocks	103	51.50	103	51.50	103	51.50	103	51.50	103	51.50	515	257.50
29	Cabbage	Ha	0.5	All blocks except B1,B2,B4,B5,B9,B10,B12,B14,B15,B16,B19,B20,B22	36	18.00	36	18.00	36	18.00	37	18.50	37	18.50	182	91.00
30	Cucumber/gherkin	Ha	0.5	All blocks	191	95.50	191	95.50	191	95.50	196	98.00	196	98.00	965	482.50
31	Caroot	Ha	0.5	All blocks	10	5.00	10	5.00	10	5.00	10	5.00	10	5.00	50	25.00
32	Lab Lab	Ha	0.5	All blocks	99	49.50	99	49.50	99	49.50	102	51.00	102	51.00	501	250.50
33	Radish	Ha	0.5	All blocks except B17,B21	50	25.00	51	25.50	51	25.50	54	27.00	54	27.00	260	130.00
34	Melons	Ha	0.5	All blocks except B21	457	228.50	457	228.50	457	228.50	462	231.00	462	231.00	2295	1147.50
35	Coccinea	Ha	0.5	B1,B2,B5,B6,B7,B9,B11	23	11.50	23	11.50	23	11.50	24	12.00	24	12.00	117	58.50
36	Cluster bean	Ha	0.5	All Blocks	78	39.00	78	39.00	78	39.00	78	39.00	78	39.00	390	195.00
37	Beetroot	Ha	0.5	B7,B9,B21	14	7.00	14	7.00	14	7.00	14	7.00	14	7.00	70	35.00
38	Tapioca	Ha	0.5	All blocks except B2,B4,B19	1290	645.00	1292	646.00	1400	700.00	1525	762.50	1580	790.00	7087	3543.50
39	Yams and colacassia	Ha	0.5	B1,B3,B5,B9,B12,B13,B15,B17,B18	96	48.00	96	48.00	106	53.00	111	55.50	111	55.50	520	260.00
40	Sweet potato	Ha	0.5	B2,B9,B10,B18	20	10.00	20	10.00	20	10.00	20	10.00	20	10.00	100	50.00
41	Commercial production of choice vegetables (Bread fruit, Brussels sprout, Brocolli, Spring Onion,	Ha	0.5	All blocks except B5,B6,B7,B9,B12,B14,B16,B17,B19,B22	44	22.00	44	22.00	44	22.00	44	22.00	44	22.00	220	110.00

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.
	KnolKhol, Turnip, Winged Bean, Butter Bean, Chinese Cabbage, Lettuce, Leek, Porum, etc.,															
42	Commercial production of location specific traditional vegetables (Athalakkai, PaluPavakkai, Mullukathiri, Poiyurkathiri, Kottapattikathiri etc.,)	Ha	0.5	All blocks except B9,B12,B14,B16,B17	78	39.00	78	39.00	78	39.00	79	39.50	79	39.50	392	196.00
43	Cultivation of hybrid Vegetables under protected structures	1000 Sq.m	1.4	All blocks except B1,B4,B10,B12,B13,B14,B15,B17,B18,B19,B21	21	29.40	21	29.40	21	29.40	32	44.80	22	30.80	117	163.80
III	**Area expansion of Medicinal and Aromatic plants**															
44	Vasambu	Ha	0.7472	All blocks except B5,B6,B7,B12,B13,B15,B16,B17,B19,B20,B22	30	22.42	30	22.42	30	22.42	30	22.42	30	22.42	150	112.10
45	Aloe vera	Ha	0.5081	B2,B4,B8,B9,B10,B11	14	7.11	14	7.11	14	7.11	14	7.11	14	7.11	70	35.55
46	Neem	Ha	0.4483	B2,B8,B9	7	3.14	7	3.14	9	4.03	9	4.03	9	4.03	41	18.37
47	Asparagus	Ha	0.7472	B8,B9	4	2.99	5	3.74	5	3.74	5	3.74	5	3.74	24	17.95
48	Amla	Ha	0.7771	B2,B4,B8,B9,B10,B11,B18,B19	30	23.31	30	23.31	30	23.31	30	23.31	30	23.31	150	116.55
49	Gloriosa	Ha	1.6438	B3,B9,B17	8	13.15	8	13.15	8	13.15	11	18.08	11	18.08	46	75.61
50	Coleus	Ha	0.5141	B3,B4,B9,B10,B12,B13,B14,B17,B21	955	490.97	957	491.99	1057	543.40	1207	620.52	1207	620.52	5383	2767.40
51	Senna	Ha	0.2988	B9	5	1.49	5	1.49	5	1.49	5	1.49	5	1.49	25	7.45

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.
52	Periwinkle	Ha	0.2988	B9	5	1.49	5	1.49	5	1.49	5	1.49	5	1.49	25	7.45
53	Vallarai	Ha	0.4782	B2,B4,B8,B9,B10,B11,B19	23	11.00	25	11.96	25	11.96	25	11.96	25	11.96	123	58.82
54	SafedMusli	Ha	3.7359	B9	5	18.68	5	18.68	5	18.68	5	18.68	5	18.68	25	93.40
55	Kodampuli	Ha	0.7472	B9	3	2.24	3	2.24	3	2.24	3	2.24	3	2.24	15	11.20
56	Gymnema	Ha	0.2989	B9	2	0.60	3	0.90	3	0.90	3	0.90	3	0.90	14	4.18
57	Ocimum	Ha	0.3586	B9,B10,B12,B13,B14	22	7.89	23	8.25	23	8.25	23	8.25	23	8.25	114	40.89
58	Phyllanthus	Ha	0.3288	B9	2	0.66	3	0.99	3	0.99	3	0.99	3	0.99	14	4.62
59	Thippili	Ha	0.7472	B9	2	1.49	2	1.49	2	1.49	2	1.49	2	1.49	10	7.45
60	Solanumnigrum	Ha	0.2989	B9	2	0.60	3	0.90	3	0.90	3	0.90	3	0.90	14	4.20
61	Vettiver	Ha	0.3	B9	2	0.60	2	0.60	3	0.90	3	0.90	3	0.90	13	3.90
62	Lemon grass/palmarosa	Ha	0.32	B9	2	0.64	3	0.96	3	0.96	3	0.96	3	0.96	14	4.48
63	Red sandal	Ha	0.6754	B2,B4,B5,B6,B8,B9,B11,B18,B19,B20	23	15.53	21	14.18	21	14.18	21	14.18	21	14.18	107	72.25
64	Sandal	Ha	0.5822	B8,B9,B11	14	8.15	14	8.15	12	6.99	12	6.99	12	6.99	64	37.27
65	Stevia	Ha	3.7359	B9	2	7.47	2	7.47	0	0.00	0	0.00	0	0.00	4	14.94
66	Mint	Ha	0.15	All blocks except B13,B15,B16,B21	47	7.05	47	7.05	47	7.05	47	7.05	47	7.05	235	35.25
IV	**Area expansion of Spices crops**															
67	Seed and Rhizomatic spices (Coriander, Turmeric, Ginger, Dry Chilly, Cumin, Fennel, Fenugreek, Dil, Cardamom etc.,)	Ha	0.3	All blocks	467	140.10	517	155.10	567	170.10	692	207.60	767	230.10	3010	903.00
68	Perennial spices (Pepper, Curry leaf,	Ha	0.5	All blocks except B9	94	47.00	94	47.00	94	47.00	94	47.00	97	48.50	473	236.50

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.
	All spice, Cinnamon, Clove, Tamarind, Nut meg etc.,)															
69	Bulbous spices Garlic	Ha	0.5		9	4.50	9	4.50	9	4.50	9	4.50	9	4.50	45	22.50
V	**Area expansion of Flower crops**															
70	Loose flowers - Jasminumsp, Crossandra, Marigold, Rose, Chrysanthemum, Nerium, Torenia	Ha	0.4	All blocks	243	97.20	235	94.00	245	98.00	250	100.00	250	100.00	1223	489.20
71	Bulbous flowers - Tube rose, Gladioli, Dahlia, Bird of paradise, Heliconia, Tulip	Ha	1.5	All blocks	198	297.00	188	282.00	190	285.00	195	292.50	195	292.50	966	1449.00
72	Cut flowers under open condition - Alstromaria, Golden Rod	Ha	1	B8	27	27.00	27	27.00	30	30.00	30	30.00	30	30.00	144	144.00
73	Cost of planting material & cultivation of Orchid, Eustoma&Anthurium under poly house / Shade net house	1000 Sq.m	7	B8	4	28.00	4	28.00	4	28.00	4	28.00	4	28.00	20	140.00
74	Cost of planting material & cultivation of carnation & Gerbera under poly house / Shade net house	1000 Sq.m	6.1	B8	4	24.40	4	24.40	4	24.40	4	24.40	4	24.40	20	122.00
75	Cost of planting material & cultivation of Rose, Lilium, under poly house / Shade net house	1000 Sq.m	4.26		4	17.04	4	17.04	4	17.04	4	17.04	4	17.04	20	85.20
VI	**Area expansion /Gap filling of Plantation crops**															

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.
76	Coffee	Ha	0.5	B21	2	1.00	2	1.00	2	1.00	2	1.00	2	1.00	10	5.00
77	Cashew	Ha	0.5	B6,B8,B15,B20	127	63.50	127	63.50	125	62.50	125	62.50	125	62.50	629	314.50
78	Arecanut	Ha	0.5	B1,B3,B13,B21	20	10.00	20	10.00	20	10.00	20	10.00	25	12.50	105	52.50
79	Betelvine	Ha	0.5	B4,B14	7	3.50	7	3.50	7	3.50	7	3.50	7	3.50	35	17.50
80	Coconut	Ha	0.5	B1,B3,B5,B6,B,B8,B9,B13,B14,B15,B20	86	43.00	87	43.50	84	42.00	84	42.00	84	42.00	425	212.50
81	Bamboo and Other crops	Ha	0.6		2	1.20	2	1.20	2	1.20	2	1.20	2	1.20	10	6.00
VII	**Rejuvenation/INM-IPM/Mulching/Anti bird net**															
82	Mango/Cashew - Rejuvenation	Ha	0.4	All blocks except B17	71	28.40	71	28.40	77	30.80	83	33.20	83	33.20	385	154.00
83	INM/IPM for Horticultural crops	Ha	0.04	All blocks except B18	1510	60.40	1515	60.60	1515	60.60	1570	62.80	1570	62.80	7680	307.20
84	Mulching	Ha	0.32	All blocks	900	288.00	905	289.60	910	291.20	920	294.40	925	296.00	4560	1459.20
85	Anti Bird net	1000 Sq.m	0.35	All blocks except B2,B4,B10,B11,B14,B16,B19	155	54.25	155	54.25	155	54.25	155	54.25	155	54.25	775	271.25
VIII	**Pollination Support through Bee Keeping**															
90	Bee hive & Colony	No	0.04	All blocks	1740	69.60	1740	69.60	1740	69.60	1740	69.60	1740	69.60	8700	348.00
91	Honey Extractor	No	0.2	All blocks	174	34.80	174	34.80	174	34.80	174	34.80	174	34.80	870	174.00
IX	**Organic Farming**															
92	Organic farming and PGS certification in 50 acre cluster	1 cluster	14.95	All blocks except B7,B22	20	299.00	19	284.05	18	269.10	18	269.10	18	269.10	93	1390.35
93	HDPE Vermibed	No	0.16	All blocks except B7,B22	920	147.20	920	147.20	940	150.40	940	150.40	940	150.40	4660	745.60
X	**Rainfed Area development**															
94	Integrated farming system - Horticulture	Ha	0.5	All blocks	900	450.00	900	450.00	950	475.00	950	475.00	1000	500.00	4700	2350.00

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.
	Based farming															
95	Green manuring	Ha	0.04	All blocks	930	37.20	935	37.40	955	38.20	955	38.20	1030	41.20	4805	192.20
96	Moisture stress management - Minimum irrigation gurantee by PUSA hydrogel	Ha	0.1	All blocks	800	80.00	800	80.00	825	82.50	825	82.50	900	90.00	4150	415.00
B	**Infra structures and Assets creation**															
I	Protected cultivation															
1	Poly Green House	1000 Sq.m	9.35	All blocks	27	252.45	26	243.10	26	243.10	27	252.45	27	252.45	133	1243.55
2	Shadenet	1000 Sq.m	7.1	All blocks	42	298.20	40	284.00	40	284.00	40	284.00	40	284.00	202	1434.20
II	**Mushroom production**															
1	Cottage mushroom unit	1 No.	1		1	1.00	1	1.00	1	1.00	1	1.00	1	1.00	5	5.00
III	**Vermicompost unit**															
1	Permanent Vermicompost Unit	600 cu.ft	1	All blocks	65	65.00	65	65.00	65	65.00	65	65.00	65	65.00	325	325.00
IV	**Supporting structures for Horticulture crop production**															
1	Staking/ Trellies/ Propping	Ha	1	All blocks except B5	572	572.00	573	573.00	578	578.00	605	605.00	610	610.00	2938	2938.00
2	Permanent Pandhal structure	Ha	4	All blocks except B5	75	300.00	75	300.00	75	300.00	70	280.00	70	280.00	365	1460.00
V	**District Horticulture information and training centre**															
VI	**Community seed bank**															
C	**Special interventions**															

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.
1	Offseason Annual Moringa production - Pod	Ha	1.25	B8,B9,B18	12	15.00	13	16.25	13	16.25	13	16.25	15	18.75	66	82.50
2	Offseason Annual Moringa production - Leaf	Ha	2	B8,B9,B18	12	24.00	13	26.00	13	26.00	13	26.00	15	30.00	66	132.00
3	Farm deficiency correction	Ha	0.04	All blocks	2108	84.32	2110	84.40	2160	86.40	2290	91.60	2340	93.60	11008	440.32
4	Promotion of Roof top Garden/ Potager garden Kit	No	0.005	All blocks	1520	7.60	1570	7.85	1620	8.10	1620	8.10	1670	8.35	8000	40.00
5	Promotion of Roof top Garden/ Potager garden Kit with shadenet	No	0.0735	All blocks	590	43.37	640	47.04	650	47.78	670	49.25	670	49.25	3220	236.69
6	Banana Bunch Sleeve	Ha	0.25	All blocks except B2,B11,B19,B21	298	74.50	298	74.50	298	74.50	298	74.50	298	74.50	1490	372.50
7	AESA based IPM in fruits and vegetables Pheramone trap	Ha	0.04	All blocks	1540	61.60	1590	63.60	1590	63.60	1640	65.60	1690	67.60	8050	322.00
8	AESA Based IPM in fruits and vegetables Yellow sticky trap	Ha	0.04	All blocks	1540	61.60	1590	63.60	1590	63.60	1640	65.60	1690	67.60	8050	322.00
9	AESA Based IPM in fruits and vegetables Light trap	Ha	0.08	All blocks	1540	123.20	1590	127.20	1590	127.20	1640	131.20	1690	135.20	8050	644.00
10	Coastal area development programme - Public	Per village	1	B8,B20	11	11.00	11	11.00	11	11.00	11	11.00	11	11.00	55	55.00
11	Coastal area development programme - Private	Ha	0.2	B8,B20	11	2.20	11	2.20	11	2.20	11	2.20	11	2.20	55	11.00
D	**Post Harvest Management**															
1	Pack house (9m X 6m)	1 No	4	All blocks	95	380.00	95	380.00	100	400.00	100	400.00	100	400.00	490	1960.00
2	Low cost onion structure 25 mt	1 No	1.75	All blocks except B2,B5,B6,B10, B11,B14,B16, B19	40	70.00	40	70.00	40	70.00	40	70.00	40	70.00	200	350.00

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.
3	Drying yard	1 No	5	B8,B9	6	30.00	6	30.00	6	30.00	6	30.00	6	30.00	30	150.00
4	Pre cooling unit 6 mt	1 No	25	B8	1	25.00	1	25.00	1	25.00	1	25.00	1	25.00	5	125.00
5	Integrated pack house (9m X 18 m)	1 No	50	B8	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
6	Mobile pre cooling unit	1 No	25	B8	1	25.00	1	25.00	1	25.00	1	25.00	1	25.00	5	125.00
7	Cold storage unit 3000 mt	1 No	400	B8	1	400.00	1	400.00	1	400.00	1	400.00	1	400.00	5	2000.00
8	Cold storage unit 5000 mt	1 No	500	B8	1	500.00	1	500.00	1	500.00	1	500.00	1	500.00	5	2500.00
9	Collection centre	1 No	15	B8	1	15.00	1	15.00	1	15.00	1	15.00	1	15.00	5	75.00
10	Retail outlet	1 No	15	B3,B8	2	30.00	2	30.00	2	30.00	2	30.00	3	45.00	11	165.00
11	Refer van/collection vehicle	1 No	26	B3,B8	3	78.00	3	78.00	3	78.00	3	78.00	3	78.00	15	390.00
12	Market intervention - Mobile venindg cart	1 No	0.3	All blocks except B19,B21	109	32.70	109	32.70	109	32.70	109	32.70	109	32.70	545	163.50
E	**Development of Farms, Nurseries and Parks**															
1	Centre of Excellence for different crops	No	1000		0	0.00	0	0.00	0	0.00	0	0.00	1	1000.00	1	1000.00
F	**Mechanization - Machineries, Equipments &Tools**															
1	Power tiller/Tractor/Minitractor	Nos	1	All blocks	165	165.00	172	172.00	175	175.00	175	175.00	180	180.00	867	867.00
2	Land development, tillage and seed bed preparation equipments	Nos	0.3	All blocks except B21	102	30.60	102	30.60	107	32.10	107	32.10	112	33.60	530	159.00
3	Manual Sprayer-Knapsack/Foot operated Sprayer	Nos	0.12	All blocks	650	78.00	655	78.60	660	79.20	650	78.00	650	78.00	3265	391.80
4	Tractor Mounted / Operated Sprayer (Below 20HP)	Nos	0.2	All blocks except B5,B6,B14,B2	103	20.60	103	20.60	108	21.60	103	20.60	103	20.60	520	104.00

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.
				1,B22												
5	Tractor Mounted / Operated Sprayer (Above 20HP)	Nos	1.26	B8,B9	20	25.20	25	31.50	30	37.80	20	25.20	20	25.20	115	144.90
6	Post Hole Digger/Augur, Pneumatic/ other Planter		1.26	All blocks except B5,B16,B21	87	109.62	92	115.92	92	115.92	82	103.32	82	103.32	435	548.10
7	Fruit Plucker, Tree pruners, Fruit Harvester, Fruit Graders, Track Trolley, Nursery Media Filling Machine, Power operated horticulture tools for pruning, budding, grating, shearing etc.	No	2.5	B8	1	2.50	1	2.50	1	2.50	1	2.50	1	2.50	5	12.50
8	Potato planter/Potato harvester / Onion harvester	No	0.3	B8	1	0.30	1	0.30	1	0.30	1	0.30	1	0.30	5	1.50
9	Mulch laying machine	No	0.7	B4,B6,B7,B8,B9,B11,B20,B22	20	14.00	20	14.00	26	18.20	21	14.70	21	14.70	108	75.60
10	Hand operated sprayer with face mask	Nos	0.025	All blocks	960	24.00	960	24.00	990	24.75	985	24.63	1010	25.25	4905	122.63
11	Nets for safe harvesting of fruits,Headlights for flower picking	Nos	0.005	All blocks	895	4.48	895	4.48	920	4.60	920	4.60	945	4.73	4575	22.89
12	Power operated sprayer	Nos	0.05	All blocks	675	33.75	675	33.75	710	35.50	700	35.00	725	36.25	3485	174.25
13	Plastic crates for vegetable & fruits handling	No of sets containing 10crates	0.075	All blocks	865	64.88	865	64.88	915	68.63	940	70.50	990	74.25	4575	343.14
14	Turmeric Boiler		2.5	B1,B3,B17,B18	3	7.50	3	7.50	3	7.50	3	7.50	4	10.00	16	40.00
15	Turmeric Polishing		0.88	B1,B3,B17,	3	2.64	3	2.64	3	2.64	3	2.64	4	3.52	16	14.08

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.
	Machine			B18												
16	Pepper Spike Threasher Stripper, Pepper peeler cum Washer	No	0.15	B21	1	0.15	1	0.15	1	0.15	1	0.15	1	0.15	5	0.75
17	Oil engine	No	0.15	B2,B4,B7,B8,B10,B14,B16,B20,B21,B22	82	12.30	62	9.30	62	9.30	62	9.30	62	9.30	330	49.50
18	5 layered Polythene spread sheets for drying horticulture produce	No	0.16	All blocks except B5,B6	215	34.40	220	35.20	210	33.60	215	34.40	215	34.40	1075	172.00
19	Aluminium Ladders for Harvesting	No	0.2	All blocks	134	26.80	134	26.80	134	26.80	134	26.80	134	26.80	670	134.00
20	Equipments for manure management (Motorized Shredder for cutting biomass for making Vermicomposts and organic mulching)	No	1.26	B2,B8,B9	15	18.90	15	18.90	15	18.90	15	18.90	15	18.90	75	94.50
G	**Water / Irrigation Management**															
1	Micro Irrigation - Drip	Ha	1.12	All blocks	1965	2200.80	1865	2088.80	1915	2144.80	1965	2200.80	2015	2256.80	9725	10892.00
2	Rain gun	Ha	0.34	All blocks	1595	542.30	1495	508.30	1520	516.80	1520	516.80	1595	542.30	7725	2626.50
3	Sprinkler	No	0.195	All blocks	1695	330.53	1595	311.03	1620	315.90	1620	315.90	1645	320.78	8175	1594.14
4	Community Tank / On Farm Pond	No	20		5	100.00	5	100.00	5	100.00	5	100.00	5	100.00	25	500.00
5	Water harvesting system for individuals	No	1.5	B2,B6,B8,B9,B11,B20	70	105.00	70	105.00	70	105.00	70	105.00	70	105.00	350	525.00
H	**Capacity Building**															
1	Training to farmers within the State. 2 days Rs.1000/farmer/day	No	0.02	All blocks	1900	38.00	1900	38.00	1950	39.00	2000	40.00	2050	41.00	9800	196.00
2	Training to farmers	No	0.105	All blocks	990	103.95	990	103.95	990	103.95	990	103.95	990	103.95	4950	519.75

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.
	outside the state. 30 farmers/Batch															
3	Exposure visit to farmers for 5 days. Rs.1000/farmer/day	No	0.05	All blocks	630	31.50	630	31.50	630	31.50	630	31.50	630	31.50	3150	157.50
4	Training to farmers at HTC	No	0.0025	All blocks except B5,B6,B7,B9,B22	2250	5.63	2250	5.63	2250	5.63	2250	5.63	2250	5.63	11250	28.15
5	Exposure visit of farmers outside India	No	4	All blocks	177	708.00	177	708.00	177	708.00	177	708.00	177	708.00	885	3540.00
6	Training to staff outside the state / Batch of 5 members	No	0.04	All blocks	106	4.24	106	4.24	106	4.24	106	4.24	106	4.24	530	21.20
7	Training to staff outside India	No	6	All blocks	28	168.00	28	168.00	28	168.00	28	168.00	28	168.00	140	840.00
8	HRD for supervisors and enterpreuners	No	20	B8	2	40.00	2	40.00	2	40.00	2	40.00	2	40.00	10	200.00
9	HRD for gardeners	No	15	B8	2	30.00	2	30.00	2	30.00	2	30.00	2	30.00	10	150.00
10	District level seminar	No	2	All blocks except B10,B16,B9	20	40.00	20	40.00	20	40.00	20	40.00	20	40.00	100	200.00
11	Computerization & governance	No	1	All blocks	25	25.00	25	25.00	25	25.00	25	25.00	25	25.00	125	125.00
12	Publicity and Documentation	No	0.5	All blocks	26	13.00	26	13.00	26	13.00	26	13.00	26	13.00	130	65.00
I	**Crop Insurance and Risk Mitigating schemes**															
	Crop Insurance	Ha	0.025	All blocks	2450	61.25	2500	62.50	2500	62.50	2550	63.75	2550	63.75	12550	313.75
	Grand Total					**15185.27**		**15047.61**		**15381.41**		**15720.71**		**17005.32**		**78340.32**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.4. Agricultural Engineering

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

Strategies:

- Promotion and strengthening of Agricultural Mechanization through training, Testing and demonstration inorderto ensure performance testing of agricultural machinery and equipment, capacity building of farmers and end users and promoting farm mechanization through demonstrations.
- Promotion of ownership to small and marginal farmers for various agricultural machinery and equipments
- Establishment of hi-tech machinery hubs for high value crops like sugarcane, cotton etc.
- Strengthening of communication and information facilities in order to disseminate the information in rural areas
- Awareness to be created towards the usage of Sugarcane infielder, Bird scarer, Mechanized row crop cultivation and Modernization of tractor workshop which indirectly increase the production.
- Promotion of agro-processing and management machinery at community level through supply of post-harvest machinery
- Promotion of Bio-mass gasifier unit which hold huge potential technology for decentralized electricity generation in rural villages. Biomass is a CO_2 neutral fuel and, therefore, unlike fossil fuels such as diesel does not contribute to net CO_2 emissions, which makes biomass based power generation systems an attractive option in mitigating the adverse effects of climate change.

- Establishment of Agricultural Engineering Extension centres in order to collect information related to Government subsidy on agricultural / machineries / equipment / irrigation systems etc., compilation of latest technologies related to Agricultural Engineering and Development of video cassettes library related to Processing of agricultural products, Working of important agricultural machines and equipment and Repair, maintenance and proper setting of the different agricultural Machines / and equipment
- Promotion of training to AED engineers onpost-harvest techniques and bio energy
- Reclamation of problem soils which needs special management for satisfactory crop production. Physical limitations can be managed by irrigation, drainage, mulching, manuring, tillage, and soil conservation measures such as terracing, contouring, and cover crops whichever is appropriate.

Expected outcome

Implementation of the above strategies such as supply of farm implements to carry out mechanised cultivation operations and demonstration to farmers the advantage of using Agricultural implements and machinery would increase the production and productivity. Post-Harvest Technologies to farmers would prevent loss of food grains during harvest and storage and Preserve the quality of produce in respect of perishable commodities. Disseminated technologies on renewable energies, in particular, solar energy for agricultural activities in respect of pumping with solar powered pumps, drying farm produce for enhancement of quality to fetch reasonable market price.

Budget

The overall budget requirement for implementation of above interventions is **₹14734.16** lakhs.

Implementing agency

The projects will be implemented by the Department of Agricultural Engineering

Table.4.19. Budget requirement for Agricultural Engineering

(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
	Capacity Building															
1	Demonstration of Agricultural Machinery	All Blocks	No's/Ha	0.04	19	0.76	19	0.76	19	0.76	19	0.76	19	0.76	95	3.80
2	Training of farmers	All Blocks	No's/Ha	0.04	17	0.68	17	0.68	17	0.68	17	0.68	17	0.68	85	3.40
3	Training of Rural Youth in workshops	All Blocks	No's/Ha	0.04	17	0.68	17	0.68	17	0.68	17	0.68	17	0.68	85	3.40
4	Demonstration of Post Harvest Technologies	All Blocks	No's/Ha	0.04	13	0.52	13	0.52	13	0.52	13	0.52	13	0.52	65	2.60
5	Financial assistance for Post Harvest Equipment	All Blocks	No's/Ha	4	6	24.00	6	24.00	6	24.00	6	24.00	6	24.00	30	120.00
	Tractors															
6	Tractor (15-20 PTO HP)	All Blocks	No's/Ha	4	51	204.00	45	180.00	45	180.00	45	180.00	45	180.00	231	924.00
7	Tractor (Above 20-40 PTO HP)	All Blocks	No's/Ha	6	10	60.00	10	60.00	10	60.00	10	60.00	10	60.00	50	300.00
8	Tractor (40-70 PTO HP)	All Blocks	No's/Ha	8.5	51	433.50	45	382.50	45	382.50	45	382.50	45	382.50	231	1963.50
	Power Tillers															
9	Power Tiller (below 8 BHP)	All Blocks	No's/Ha	1	50	50.00	50	50.00	50	50.00	50	50.00	50	50.00	250	250.00
10	Power Tiller (8 BHP & above)	All Blocks	No's/Ha	1.75	272	476.00	275	481.25	303	530.25	312	546.00	302	528.50	1464	2562.00
	Rice Transplanter															
11	Self Propelled Rice Transplanter (4 rows)	All Blocks	No's/Ha	2.5	17	42.50	31	77.50	31	77.50	31	77.50	31	77.50	141	352.50
	Specialized Self Propelled Machinery															

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
12	Post Hole Digger / Augur	All Blocks	No's/Ha	0.63	6	3.78	6	3.78	6	3.78	6	3.78	6	3.78	30	18.90
	a. Land Development, tillage and seed bed preparation equipments															
13	Disc Plow	All Blocks	No's/Ha	0.3	3	0.90	3	0.90	3	0.90	3	0.90	3	0.90	15	4.50
14	Cultivator	All Blocks	No's/Ha	0.2	10	2.00	10	2.00	10	2.00	10	2.00	10	2.00	50	10.00
15	Rotavator	All Blocks	No's/Ha	0.35	50	17.50	31	10.85	31	10.85	31	10.85	31	10.85	174	60.90
	b. Sowing Planting, Reaping and Digging Equipments:															
16	Seed drill	All Blocks	No's/Ha	0.4	2	0.80	2	0.80	2	0.80	0	0.00	0	0.00	6	2.40
17	f. Chaff Cutter (Operated by engine / electric motor below 3 hp and by power tiller and tractor of below 20 BHP tractor)	All Blocks	No's/Ha	0.25	75	18.75	75	18.75	75	18.75	75	18.75	75	18.75	375	93.75
	a.Land Development, tillage and seed bed preparation equipments															
18	Disc Plow	All Blocks	No's/Ha	0.6	8	4.80	8	4.80	8	4.80	8	4.80	8	4.80	40	24.00
19	Cultivator	All Blocks	No's/Ha	0.3	5	1.50	5	1.50	5	1.50	5	1.50	5	1.50	25	7.50
20	Rotavator	All Blocks	No's/Ha	0.95	260	247.00	277	263.15	270	256.50	275	261.25	275	261.25	1357	1289.15
	b. Sowing Planting, Reaping and Digging Equipments:															

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
21	Zero till seed cum fertilizer drill	All Blocks	No's/Ha	0.7	35	24.50	35	24.50	35	24.50	35	24.50	35	24.50	175	122.50
	d.Harvesting& Threshing Equipments															
22	Thresher/Multi Crop threshers	All Blocks	No's/Ha	4	5	20.00	5	20.00	5	20.00	5	20.00	5	20.00	25	100.00
	e.Equipments for Residue management/Hay and Forage Equipments															
23	Sugarcane thrash Cutter	All Blocks	No's/Ha	2	13	26.00	13	26.00	13	26.00	13	26.00	13	26.00	65	130.00
24	Balers (Round)	All Blocks	No's/Ha	3.5	11	38.50	11	38.50	11	38.50	11	38.50	11	38.50	55	192.50
25	Sugarcane ratoon manager	All Blocks	No's/Ha	1	1	1.00	1	1.00	1	1.00	1	1.00	1	1.00	5	5.00
	All Manual/animal drawn equipment/implements / Tools															
26	Drum Seeder (Below 4 Row)	All Blocks	No's/Ha	0.1	27	2.70	27	2.70	27	2.70	27	2.70	27	2.70	135	13.50
27	Drum Seeder (Above 4 Row)	All Blocks	No's/Ha	0.15	2	0.30	2	0.30	2	0.30	2	0.30	2	0.30	10	1.50
28	Tree climber	All Blocks	No's/Ha	0.07	17	1.19	17	1.19	17	1.19	17	1.19	17	1.19	85	5.95
	Plant protection equipments															
29	Manual sprayer: Knapsack/foot operated sprayer	All Blocks	No's/Ha	0.015	245	3.68	275	4.13	285	4.28	305	4.58	325	4.88	1435	21.55
30	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity 8-12 lts)	All Blocks	No's/Ha	0.06	112	6.72	105	6.30	100	6.00	95	5.70	95	5.70	507	30.42
31	Powered Knapsack Sprayer/Power operated Taiwan	All Blocks	No's/Ha	0.08	143	11.44	125	10.00	120	9.60	110	8.80	105	8.40	603	48.24

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
	sprayer (capacity above 12-16 lts)															
32	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity above 16 lts)	All Blocks	No's/Ha	0.1	203	20.30	205	20.50	206	20.60	225	22.50	224	22.40	1063	106.30
33	Establishment of Farm Machinery Banks for Custom Hiring	All Blocks Except B4	No's/Ha	28	12	336.00	12	336.00	12	336.00	12	336.00	12	336.00	60	1680.00
34	Establishment of Hi-Tech, High Productive Equipment Hub for Custom Hiring	B2,B8,B9, B10,B12,B 20	No's/Ha	112	1	112.00	1	112.00	1	112.00	1	112.00	1	112.00	5	560.00
35	Promotion of Farm Mechanization in Selected Villages	All Blocks	No's/Ha	11.5	7	80.50	7	80.50	7	80.50	7	80.50	7	80.50	35	402.50
36	Financial assistance for promotion of Mechanized Farming operations	B2,B8,B9, B10,B12,B 20	No's/Ha	0.04	135	5.40	142	5.68	131	5.24	128	5.12	129	5.16	665	26.60
	Tractor Hiring Scheme															
37	Purchase of Tractors for AED	B2,B8,B9, B10,B12,B 20	No's/Ha	8	5	40.00	2	16.00	1	8.00	1	8.00	2	16.00	11	88.00
38	Purchase of Tractor drawn implemnets for AED	All Blocks	No's/Ha	0.5	17	8.50	7	3.50	6	3.00	6	3.00	6	3.00	42	21.00
39	Purchase of Bull Dozers for AED	B2,B8,B9, B10,B12,B 20	No's/Ha	80	3	240.00	1	80.00	1	80.00	1	80.00	1	80.00	7	560.00
40	Purchase of Paddy Transplanter for AED	B2	No's/Ha	18	1	18.00	0	0.00	0	0.00	0	0.00	0	0.00	1	18.00
41	Purchase of Paddy combine Harvester for AED	B2	No's/Ha	17	1	17.00	0	0.00	0	0.00	0	0.00	0	0.00	1	17.00

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
42	Purchase of Balers for AED	B2,B8,B9, B10,B12,B 20	No's/Ha	4.5	3	13.50	1	4.50	1	4.50	1	4.50	1	4.50	7	31.50
43	Purchase of Multi Crop Thresher for AED															
	Solar Energy															
	5 hp	All Blocks	No's/Ha	3.75	22	82.50	20	75.00	21	78.75	20	75.00	21	78.75	104	390.00
	7.5 hp	All Blocks	No's/Ha	5.3	5	26.50	94	498.20	7	37.10	10	53.00	12	63.60	128	678.40
	10 hp	All Blocks	No's/Ha	6.75	11	74.25	10	67.50	10	67.50	10	67.50	10	67.50	51	344.25
	400-600sq.ft	B2	No's/Ha	6.5	1	6.50	0	0.00	0	0.00	0	0.00	0	0.00	1	6.50
	Other machineries															
44	Construction of LD & MI Repair Shed	B2	No's/Ha	20	1	20.00	0	0.00	0	0.00	0	0.00	0	0.00	1	20.00
45	Construction of Training Centre for farmers with furniture and accessories	B2	No's/Ha	50	1	50.00	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00
	Information Technology (IT) related items															
46	Computer & its accessories	B2,B8	No's/Ha	0.8	1	0.80	1	0.80	1	0.80	1	0.80	1	0.80	5	4.00
47	Xerox machine	B2,B8	No's/Ha	1.5	1	1.50	1	1.50	1	1.50	1	1.50	1	1.50	5	7.50
	Mecanized row crop cultivation-Pilot mechanization Demonstration	B2,B8	No's/Ha	0.04	1	0.04	1	0.04	1	0.04	1	0.04	1	0.04	5	0.20
48	Chain saw/ Wheel barrow/ Mango grader/ planter and other suitable self propelled machineries and equipments for	All Blocks	No's/Ha	1	5	5.00	5	5.00	5	5.00	5	5.00	5	5.00	25	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
	horticulture Crops															
	Post Harvest Equipments for food grains, oil seeds and Horticultural Equipments															
49	Mini Dal Mill	B2,B8	No's/Ha	1.7	1	1.70	1	1.70	1	1.70	1	1.70	1	1.70	5	8.50
50	Millet Mill	B2,B8	No's/Ha	1.5	1	1.50	1	1.50	1	1.50	1	1.50	1	1.50	5	7.50
51	Oil mill with filter press (for all type of Horticulture / Food grain / Oil seeds crop)	All Blocks	No's/Ha	1.2	10	12.00	10	12.00	10	12.00	10	12.00	10	12.00	50	60.00
52	Packing Machines (for all types of Horticulture / Food grain / Oil seeds crop)	All Blocks	No's/Ha	3	2	6.00	2	6.00	2	6.00	2	6.00	2	6.00	10	30.00
53	All types of Power driven Dehusker/ sheller/ Threshers/ Harvesters/ De-spiking/ Deconing Machine/ Peeler/ Splitter/ Stripper (for all type of Horticulture / Food grain / Oil seeds crop)	All Blocks	No's/Ha	1.2	2	2.40	2	2.40	2	2.40	2	2.40	2	2.40	10	12.00
54	All types of Boiler/ Steamer/ Dryer solar (for all type of Horticulture / Food grain / Oil seeds crop)	All Blocks	No's/Ha	2	2	4.00	2	4.00	2	4.00	2	4.00	2	4.00	10	20.00
55	All types of Washing Machines (for all	All Blocks	No's/Ha	1.5	4	6.00	4	6.00	4	6.00	4	6.00	4	6.00	20	30.00

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
	type of Horticulture / Food grain / Oil seed crop)															
56	All types of Grinder/ Pulveriser/ Polisher (for all type of Horticulture / Food grain / Oil seed crop)	All Blocks	No's/Ha	0.3	2	0.60	2	0.60	2	0.60	2	0.60	2	0.60	10	3.00
57	All types of Cleaner cum grader/ Gradient separator/ Specific gravity separator (for all types of Horticulture / Food grain / Oil seed crop)	B2,B8	No's/Ha	0.75	1	0.75	1	0.75	1	0.75	1	0.75	1	0.75	5	3.75
58	Construction of Agricultural Engineering Extension centres (AEECs)	B2,B8	No's/Ha	75	1	75.00	1	75.00	1	75.00	0	0.00	0	0.00	3	225.00
59	Training of AED Engineers on " Agricultural Processing" and " Bio- Energy"	B2,B8	No's/Ha	0.04	1	0.04	1	0.04	1	0.04	1	0.04	1	0.04	5	0.20
60	Reclamation of Problem(Alkaline & Saline) soils	All Blocks	No's/Ha	0.6	400	240.00	200	120.00	100	60.00	150	90.00	200	120.00	1050	630.00
	Total					**3233.98**		**3235.75**		**2751.36**		**2739.19**		**2773.88**		**14734.16**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.5. Agricultural Marketing

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

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

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

Agricultural produce are seasonal and perishable in nature. In a good season there may be a local glut, but because of insufficient transport facilities, lack of good roads and poor availability of packaging materials, the surplus cannot be taken quickly enough to the natural markets in urban areas. Moreover, the surplus often cannot be stored for sale in the off-season because of inadequate local storage facility; the farmers are often forced to market their produce at low price. Thus, the cultivars do not get a good price for their produce because of the glut, and some of it is spoiled resulting in complete loss. Currently pulses are processed manually using thirugu, ural, chakki, etc., which is laborious and time consuming. Due to existing problems in processing of pulses and millets, their market is not profitable for the farmers growing pulses. To reduce the loss of agricultural produce which are up to 30 per cent,

necessary provisions are needed to ensure remunerative price to the produce, encourage processing from the present level of 10 per cent of the total.

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

Components

a) Promotion of commodity groups and market information
b) Strengthening of Regulated Markets and uzhavar shandies
c) Formation of Farmer Producer Organizations (FPO)
d) strengthening of existing commodity groups
e) Provision of market access and market activities
f) Provision of post harvest infrastructure and machineries
g) Arrangement of capacity building programmes

Budget

The district plan proposes an outlay of **Rs.3516.32** lakhs over a period of five years

Expected Outcome

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

Implementing Agency

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

Table 4.20. Budget for strengthening of Agricultural Marketing and Agri-Business in Villupuram District

(₹. in lakhs)

Sl. No	Intervention	Unit	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Promotion of Commodity Groups and Market Information															
1	Integrated Commodity Management through Aggregation	Nos.	0.03	B14, B15	18	0.54	18	0.54	18	0.54	18	0.54	18	0.54	90	2.70
	Strengthening of UzhavarSandhai and Regulated Market															
2	Additional Shops	Nos.	0.3	B7, B12, B17	0	0.00	15	4.50	15	4.50	0	0.00	0	0.00	30	9.00
3	Cold Storage	Nos.	22.5	B7, B12, B17	3	67.50	0	0.00	0	0.00	0	0.00	0	0.00	3	67.50
4	Drying Yard	Nos.	5	All Blocks	21	105.00	21	105.00	42	210.00	21	105.00	21	105.00	126	630.00
5	Storage godown	Nos.	16	All Blocks	21	336.00	0	0.00	63	1008.00	0	0.00	21	336.00	105	1680.00
6	Proposed Paver Block 3000 Sqm	Nos.	0.001	B7, B12, B17	1500	1.50	0	0.00	0	0.00	0	0.00	0	0.00	1500	1.50
7	Provision of Automatic seed vending machine in UzhavarSandhai	Nos.	0.75	B7, B12, B17	3	2.25	0	0.00	0	0.00	0	0.00	0	0.00	3	2.25
8	Drinking Water Facility	Nos.	0.5	B7, B12, B17	3	1.50	0	0.00	0	0.00	0	0.00	0	0.00	3	1.50
9	Administrative Office Room (Vevichle shed ,waiting hall,washingRoom,Bore well with Motor, water Tank)	Nos.	3	B7, B12, B17	3	9.00	0	0.00	0	0.00	0	0.00	0	0.00	3	9.00
10	Strengthening of RM	Nos.	5	B7	0	0.00	0.15	0.75	0.15	0.75	0.15	0.75	0.15	0.75	0.6	3.00
	Formation of FPO / Strengthening of Existing Commodity Groups															
11	FPO	Nos.	0.25	All Blocks	840	210.00	420	105.00	420	105.00	420	105.00	420	105.00	2520	630.00
	Provision of Market Access and Market Activities															
12	Aluminium tray	Nos.	0.003	B7, B12, B17	60	0.18	0	0.00	0	0.00	0	0.00	0	0.00	60	0.18

Sl. No	Intervention	Unit	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
13	Dunnage	Nos.	0.05	B5, B11	15	0.75	15	0.75	0	0.00	0	0.00	0	0.00	30	1.50
15	Wheing balance(300Kg)	Nos.	0.2	B7, B12, B17	138	27.60	0	0.00	0	0.00	0	0.00	0	0.00	138	27.60
16	Loading platform	Nos.	20, 0.0125	B7	501	26.25	0	0.00	0	0.00	0	0.00	0	0.00	501	26.25
17	Moisturemeter	Nos.	0.25	All Blocks	21	5.25	0	0.00	0	0.00	0	0.00	0	0.00	21	5.25
18	Plastic crates	Nos.	0.1	B15	10	1.00	10	1.00	10	1.00	10	1.00	10	1.00	50	5.00
19	Provision of Gunnies	Nos.	0.005	B7, B12, B17	300	1.50	0	0.00	0	0.00	0	0.00	0	0.00	300	1.50
20	Tarpaulin	Nos.	0.1	All Blocks	200	20.00	200	20.00	200	20.00	200	20.00	200	20.00	1000	100.00
	Post Harvest Infrastructure and Machinaries															
21	Coconut Ladder	Nos.	0.04	All Blocks	21	0.84	0	0.00	0	0.00	0	0.00	0	0.00	21	0.84
22	Solar Dryer	Nos.	1.5	B1, B7	2	3.00	0	0.00	0	0.00	0	0.00	0	0.00	2	3.00
	Capacity building Programme	.														
23	Exposure Visits - within state	Nos.	0.75	All Blocks	21	15.75	21	15.75	21	15.75	21	15.75	21	15.75	105	78.75
24	Exposure Visits - outside state - 3 days	Nos.	2	All Blocks	21	42.00	21	42.00	21	42.00	21	42.00	21	42.00	105	210.00
25	Training on Market led Extension, Agmarkgrading&Food safety, post harvest technology, Supply Chain Management, Grading-sorting-packing, Market linkages & Exports, Food processing and value addition at district level	Nos.	0.2	B12	20	4.00	20	4.00	20	4.00	20	4.00	20	4.00	100	20.00
	Total					**881.41**		**299.29**		**1411.54**		**294.04**		**630.04**		**3516.32**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.6. Seed and Organic Certification

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

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

Project components

- Strengthening of Seed Testing laboratories

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

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

- Creation of infrastructure facilities in seed testing laboratories

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

- Capacity building

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

- Strengthening of communication and networking facilities

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

Expected outcome

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

Budget

Seed testing plays a pivotal role in modern agriculture. It is being carried out to analyze factors like germination, physical purity, moisture, seed health and admixture of other distinguishable varieties. Seed testing is carried out in the notified seed testing laboratories. The Seed testing results are very important for the successful implementation of Seed Certification and Seed Law Enforcement programmes. Apart from certified seed samples and samples

received from the seed quality control wing, the service samples sent by the farmers, seed dealers and seed producers are also tested in these laboratories of Villupuram district. The overall budget requirement for implementation of above interventions is ₹ **31.72** lakhs.

Implementing agency

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

Table.4.21. Budget requirement for Seed and Organic Certification

(₹. in lakhs)

Sl. No	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
I	**Strengthening of laboratory facilities**															
1	Blower, Conductivity meter, Dehuller /Scarifier, Dehumidifier Air Conditioner, Digital moisture meter, Dunnage, Fabricated display Racks ,Geaser, Generator, Heater, Hot air oven, Humidifier, Incubator, Induction stove, Microscope, Moisture meter, Packing machine, R. O system, Sample racks, Seed Grinder, Sieve, Thermohydro meter, Dunnage, Trolley for carriages, Working chair, Working table, Miscellaneous,	All Blocks	Nos	13.36	1.00	13.36	0.00	0.00	1.00	13.36	0.00	0.00	0.00	0.00	2.00	26.72
II	Strengthening **of communication and networking facilities**															
2	Computer accessories	All Blocks	No's	0.50	10.00	5.00	0	0.00	0	0.00	0	0.00	0	0.00	10	5.00
	Total					**18.36**		**0.00**		**13.36**		**0.00**		**0.00**		**31.72**

4.7. Animal husbandry

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

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

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

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

Increasing the availability of fodder through field level interventions

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

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

1. Establishment of vermicomposting unit
2. Distribution of Azolla trays
3. Fodder plot development
4. Meikal land development
5. Distribution of seedlings, sprinklers, grass cutters and rainguns to the farmers
6. Development of seed production plots

Increasing the availability of fodder by strengthening farm infrastructure

The livestock sector is handicapped due to inadequate infrastructure facilities as a result of low productivity. Infrastructure development for animal husbandry is felt essential to provide the desired veterinary services in the interior pockets of the districts so as to enable the livestock owners living in the remote areas can avail the opportunities to consider AH activities as livelihood option and maximize profit through livestock sector. Adequately providing proper infrastructure and equipment to the veterinary health care institution is necessary for the timely diagnosis and treatment of animal diseases. Further, emphasis has to be laid on optimum utilization of waste land to grow fodder.

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

1. Establishment of farm production covers
2. Construction of silo pits and overhead tanks
3. Establishment of feed mixing units
4. Installation of rain guns and sprinklers
5. Procurement of agri inputs

Livestock breeding management

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

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

Livestock industry continues to demonstrate a beneficial impact on rural people by improving their income, employment and consumption and thereby acting as a potential tool in alleviating rural poverty. Artificial insemination (AI) has proven to be very effective for the improvement of the genetic potential of animals for higher production and there is no surprise why today AI is the back bone of all breeding programmes in India. The replacement of unproductive and ageing animals in the herd and its expansion are very important to maintain the scale of economy of the farm. Augmentation of fertility in repeat breeders and sex-sorted semen are some of the modern scientific tools which have been proposed to be employed for effective breeding management to enhance the livestock

fertility and productivity. The following interventions will help to improve livestock breeding management, such as

1. CIDR
2. Establishment and distribution of sex-sorted semen facility
3. Establishment of IVF lab
4. Establishment of LN2 and embryo transfer lab
5. Oestrous synchronization

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. Upgradation of vaccine production facilities for bacteria and virus
2. Procurement of vaccines, medicine, diagnostic kit
3. Animal quarantine facility in govt. farm
4. Animal testing facility

Improving the livestock productivity

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

1. Distribution of sheep, goat, buffalo, piggery, poultry units
2. Establishment of modern poultry, rabbit , piggery, sheep, goat and bull shed
3. Popularizing quail rearing
4. Integrated farming

Improving the service delivery at veterinary institutions

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

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

Enhancing livestock management

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

The intervention proposed are

1. Animal identification and traceability
2. Conservation of indigenous breeds
3. Improvement of livestock shandy
4. Establishment of slaughter house

Capacity building

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

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

Establishment of farmers training Centre

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

Budget allocation

The major themes proposed in the plan for animal husbandry sector with a total budget out lay of ₹. **17401.75 lakhs.**

Project implementing agency

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

Table.4.22. Budget requirement for Animal Husbandry

(₹. in lakhs)

Sl. No	Components	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 Vermi composting unit (single bed)	All Blocks	440	22.00	440	22.00	440	22.00	440	22.00	440	22.00	2200	110.00
2	Distribution of Azolla trays	All Blocks	440	13.20	440	13.20	440	13.20	440	13.20	440	13.20	2200	66.00
3	Distribution of Silage bags for conservation of fodder crops	All Blocks	440	2.20	440	2.20	440	2.20	440	2.20	440	2.20	2200	11.00
4	Fodder plot development	All blocks	400	20.00	400	20.00	400	20.00	200	10.00	200	10.00	1600	80.00
5	Development of Seed Production plots	All Blocks	44	11.00	44	11.00	44	11.00	44	11.00	44	11.00	220	55.00
6	Distribution of Raingun to Livestock farmers	B1	20	5.00	20	5.00	20	5.00	20	5.00	20	5.00	100	25.00
7	Distribution of sprinkler for fodder production	B1	20	3.00	20	3.00	20	3.00	20	3.00	20	3.00	100	15.00
	Increasing the Availability of Fodder by Strengthening Farm Infrastructure													
8	Establishment of Vermicompost unit (10 beds) at Farms	B1	1	4.00	1	4.00	1	4.00	1	4.00	1	4.00	5	20.00
9	Erection of Transformers to improve irrigation facility in Govt.farm	B1	0	0.00	1	30.00	0	0.00	0	0.00	0	0.00	1	30.00
10	Establishment of Farm Protection Cover (Bio-security wall)	B1	15	75.00	15	75.00	0	0.00	0	0.00	0	0.00	30	150.00
11	Establishment of Feed mixing/ feed block units	B1	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	1	25.00

Sl. No	Components	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
			Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
12	Construction of silo Pit for livestock farm	B1	5	5.00	4	4.00	4	4.00	4	4.00	4	4.00	21	21.00
13	Construction of Over Head Tanks/ GLR / Pre-fabricated tanks in farm	B1	0	0.00	2	40.00	0	0.00	0	0.00	0	0.00	2	40.00
14	Drip irrigation for livestock farms	B1	50	30.00	50	30.00	50	30.00	50	30.00	50	30.00	250	150.00
15	Bore well for livestock farms	B1	4	32.00	4	32.00	4	32.00	4	32.00	4	32.00	20	160.00
16	Installation of Rain gun in Govt.farm in cultivated areas	B1	50	20.00	50	20.00	50	20.00	50	20.00	50	20.00	250	100.00
17	Installation of Sprinkler system in fodder cultivated areas in Govt.farm	B1	25	10.00	25	10.00	25	10.00	25	10.00	25	10.00	125	50.00
18	Procurement of Agri. inputs for Farms	B1	125	18.75	125	18.75	125	18.75	125	18.75	125	18.75	625	93.75
19	Procurement of Agricultural implements(tractor, trailers, harvesters, ploughs, chaff cutter, grass cutter etc)	B1	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
	Livestock Breeding Management													
20	CIDR (Controlled Internal Drug Release) for increasing Fertility in Cattle	All Blocks	660	6.60	660	6.60	660	6.60	660	6.60	660	6.60	3300	33.00
21	Induction of new Genetic Pool	B1	100	20.00	100	20.00	100	20.00	100	20.00	100	20.00	500	100.00
	Livestock Health													
22	Up gradation of Vaccine Production Facilities -Bacterial	All Blocks	22	660.00	22	660.00	22	660.00	22	660.00	22	660.00	110	3300.00
23	Up gradation of Vaccine Production Facilities -Viral	All Blocks	22	1100.00	22	1100.00	22	1100.00	22	1100.00	22	1100.00	110	5500.00
24	Animal Quarantine Facility in Govt.farm to prevent disease	B1	1	50.00	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00

Sl. No	Components	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
	outbreak													
25	**Improving the Livestock Productivity**													
26	Distribution of Sheep/Goat units -semi intensive system	All Blocks	44	26.40	44	26.40	44	26.40	44	26.40	44	26.40	220	132.00
27	Distribution of Buffalo units(5 Buffaloes)	All Blocks	22	99.00	22	99.00	22	99.00	22	99.00	22	99.00	110	495.00
28	Integrated farming (Goat+Cattle+Fish+Agriculture /Horticulture)	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	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	All Blocks	220	220.00	220	220.00	220	220.00	220	220.00	220	220.00	1100	1100.00
31	Establishment of Modern Sheep/Goat Shed	B1	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													
32	Deep freezer facility for Storage of vaccines and Medicines	All Blocks	0	0.00	0	0.00	22	220.00	0	0.00	0	0.00	22	220.00
33	Establishment of Infrastructure facilities for Veterinary Institutions	B5, B12, B22	3	90.00	0	0.00	0	0.00	0	0.00	0	0.00	3	90.00
34	Establishment of Mobile Disease Diagnostic Labs	All Blocks	22	440.00	22	440.00	22	440.00	22	440.00	22	440.00	110	2200.00
35	Establishment of Mobile Veterinary Units	All Blocks	5	50.00	5	50.00	5	50.00	5	50.00	2	20.00	22	220.00
36	Establishment of surgical theatres at veterinary institution	All Blocks	5	150.00	5	150.00	5	150.00	5	150.00	2	60.00	22	660.00
37	Providing solar lighting panels at veterinary institution	All Blocks	44	44.00	44	44.00	44	44.00	44	44.00	44	44.00	220	220.00

Sl. No	Components	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
			Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
39	Package of Modern Veterinary Diagnostic Aids to Veterinary Institutions such as Computerised X rays, Ultrasound, Diathermy etc.	All Blocks	5	150.00	5	150.00	5	150.00	5	150.00	2	60.00	22	660.00
40	Establishment of Ambulance facility for animals	B1	1	80.00	1	80.00	0	0.00	0	0.00	0	0.00	2	160.00
	Livestock Management													
41	Animal Identification and Traceability	All Blocks	300	30.00	30	3.00	30	3.00	30	3.00	30	3.00	420	42.00
42	Conservation of Indigenous breeds	All Blocks	1	10.00	1	10.00	1	10.00	1	10.00	1	10.00	5	50.00
	Capacity Building													
43	Establishment of Farmers training Centre	B1	0	0.00	1	200.00	0	0.00	0	0.00	0	0.00	1	200.00
44	Conducting Demonstrations, Camps and Campaigns	All Blocks	66	6.60	66	6.60	66	6.60	66	6.60	66	6.60	330	33.00
45	Creating awarness of livestock management to the farmers through Training Programmes	All Blocks	220	22.00	220	22.00	220	22.00	220	22.00	220	22.00	1100	110.00
	Grand Total			**3660.75**		**3737.75**		**3557.75**		**3277.75**		**3167.75**		**17401.75**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.8. Dairy development

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

Dairy sector acts as an important source of income for rural families, plays a vital role in providing gainful employment and income generating opportunities in the district. Dairy industry in the country is expected to witness spectacular growth in 2017, according to experts.

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

Strengthening of milk storages and processing units

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

The major interventions are,

1. Milk storage tanks of various capacities
2. Milk tankers
3. Milk pumps
4. Processing equipments
5. Pasteurizers
6. Heaters and chillers

7. Washer and conveyors
8. Pipes and fittings
9. Cleaning equipments
10. Electrical installations (UPS, generators, stabilizers, control panel)

Enhancing milk production and milk processing units

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

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

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

Capacity building

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

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

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

Marketing structures

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

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

Quality control

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

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

Processing and value addition

While adding value to farm and livestock products before they reach the local and international market is one of the key aims of Vision 2030. Product diversification has become an important aspect of business strategy with reasons for this increased focus being increased profitability, reduction in risk, increasing competition, higher growth and more efficient resource allocation. Value addition in the dairy value chain is still a challenge in our country. Value addition has been hailed as one of the solutions to the perish ability 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. Skim milk powder plant
2. Dairy processing plants
3. Water and effluent treatment plants
4. Steam raising plant
5. Fat handling and other dairy equipment's

Development for dairy sector

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

1. Construction of dairy farm and skim milk powder plant
2. BMC building
3. Cattle feed plants
4. Ware house for dairy products
5. Ice cream manufacturing buildings.

Budget allocation

An outlay of Rs.**18953.00** lakhs is proposed to fulfill the aforementioned interventions for five years.

Implementing agency

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

Table.4.23. Budget requirement for Dairy development

(₹. in lakhs)

Sl. No	Components	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Engineering section															
1	Electrical installation like Tranformemr, UPS, Stabilisers, Control Panel MCC etc.,	All blocks	1	25	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	1	15	2	30.00	2	30.00	2	30.00	2	30.00	2	30.00	10	150.00
3	Tub washer, Canwashers, Crate conveyor systems.	All blocks	1	10	1	10.00	1	10.00	1	10.00	1	10.00	1	10.00	5	50.00
4	Point of Sale Machines and billing systems	All blocks	1	0.25	40	10.00	40	10.00	40	10.00	40	10.00	40	10.00	200	50.00
5	SS pipes and fittings	All blocks	1	5	2	10.00	2	10.00	2	10.00	2	10.00	2	10.00	10	50.00
6	Solar system for water heating	All blocks	1	2	8	16.00	8	16.00	8	16.00	8	16.00	8	16.00	40	80.00
7	Packing Machineries for milk, Butter, Ghee, SMP and Other Milk products	All blocks	1	18	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	1	10	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	1	25	4	100.00	4	100.00	4	100.00	4	100.00	4	100.00	20	500.00
10	Milk Pumps of Vaious capacities	All blocks	1	0.5	9	4.50	9	4.50	9	4.50	9	4.50	9	4.50	45	22.50
11	Generator of various capacities	All blocks	1	20	1	20.00	0	0.00	1	20.00	0	0.00	0	0.00	2	40.00
12	Curd processing equipments	All blocks	1	50	0	0.00	1	50.00	0	0.00	0	0.00	0	0.00	1	50.00
13	Cleaning In Place equipments with accessories	All blocks	1	75	0	0.00	1	75.00	0	0.00	0	0.00	0	0.00	1	75.00
	Procurement and Input															
14	Veterinary Medicine	All blocks	1	2	8	16.00	8	16.00	8	16.00	8	16.00	8	16.00	40	80.00

Sl. No	Components	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
15	Two wheeler for AI technician	All blocks	1	0.5	10	5.00	10	5.00	60	30.00	60	30.00	60	30.00	200	100.00
16	Computer system with accessories	All blocks	1	0.5	45	22.50	45	22.50	45	22.50	45	22.50	45	22.50	225	112.50
17	Fodder seed materials	All blocks	1	0.25	50	12.50	50	12.50	50	12.50	50	12.50	50	12.50	250	62.50
18	Fodder development equipments like chaff cutter, Mower etc.,	All blocks	1	0.2	50	10.00	50	10.00	50	10.00	50	10.00	50	10.00	250	50.00
19	Bulk Milk coolers of Various capacities	All blocks	1	15	5	75.00	5	75.00	5	75.00	5	75.00	5	75.00	25	375.00
20	Milk cans	All blocks	1	0.035	1000	35.00	1000	35.00	1000	35.00	1000	35.00	1000	35.00	5000	175.00
21	Electronic weighing scales of various capacities.	All blocks	1	0.3	50	15.00	50	15.00	50	15.00	50	15.00	50	15.00	250	75.00
22	Electronic milk testing equipments	All blocks	1	1.25	50	62.50	50	62.50	50	62.50	50	62.50	50	62.50	250	312.50
23	Milking machine	All blocks	1	0.8	50	40.00	50	40.00	50	40.00	50	40.00	50	40.00	250	200.00
24	Cow shed	All blocks	1	5	50	250.00	50	250.00	50	250.00	50	250.00	50	250.00	250	1250.00
25	Society Buildings	All blocks	1	20	10	200.00	10	200.00	10	200.00	10	200.00	10	200.00	50	1000.00
26	Cryogenic containers	All blocks	1	0.35	50	17.50	50	17.50	50	17.50	50	17.50	50	17.50	250	87.50
27	Equipments for Artificial Insemination	All blocks	1	0.5	6	3.00	6	3.00	6	3.00	6	3.00	6	3.00	30	15.00
	Capacity building															
28	Training of personnel of MPCS, Union and Federation.	All blocks	1	0.05	450	22.50	450	22.50	450	22.50	450	22.50	450	22.50	2250	112.50
29	Infertility Camps	All blocks	1	0.2	320	64.00	320	64.00	320	64.00	320	64.00	320	64.00	1600	320.00
	Marketing															
30	Parlour structures	All blocks	1	5	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	1	0.3	250	75.00	250	75.00	250	75.00	240	72.00	240	72.00	1230	369.00
32	Product Billing systems	All blocks	1	0.3	50	15.00	50	15.00	30	9.00	30	9.00	70	21.00	230	69.00
	Quality control	All blocks														

Sl. No	Components	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
33	Adulteration detection equipments	All blocks	1	4	2	8.00	2	8.00	2	8.00	2	8.00	2	8.00	10	40.00
34	Milk testing equipment and Laboratory.	All blocks	1	5	2	10.00	2	10.00	2	10.00	2	10.00	2	10.00	10	50.00
	Processing															
35	Dairy Processing Plants	All blocks	1	6000	0	0.00	0	0.00	0	0.00	1	6000.00	0	0.00	1	6000.00
36	Refrigeration Plants	All blocks	1	500	0	0.00	0	0.00	0	0.00	1	500.00	0	0.00	1	500.00
37	Water Treatment Plants. Reverse Osmosis plant	All blocks	1	100	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	1	100.00
38	Effluement treatment plant	All blocks	1	100	0	0.00	0	0.00	0	0.00	2	200.00	0	0.00	2	200.00
39	Steam raining plant with accessories	All blocks	1	100	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00	1	100.00
40	Fat handling equipments	All blocks	1	200	0	0.00	0	0.00	0	0.00	1	200.00	0	0.00	1	200.00
41	Dairy equipments	All blocks	1	50	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
	Civil work Infrastructure															
42	Construction of Dairy	All blocks	1	1500	0	0.00	0	0.00	1	1500.00	0	0.00	0	0.00	1	1500.00
43	BMC buildings	All blocks	1	15	5	75.00	5	75.00	5	75.00	5	75.00	5	75.00	25	375.00
44	Ice cream and dairy product buildings	All blocks	1	2500	0	0.00	0	0.00	1	2500.00	0	0.00	0	0.00	1	2500.00
45	Ware house for Dairy products	All blocks	1	200	0	0.00	0	0.00	1	200.00	0	0.00	0	0.00	1	200.00
46	Ware house for Dairy consumables	All blocks	1	200	0	0.00	0	0.00	0	0.00	0	0.00	1	200.00	1	200.00
	Grand Total					**1465.00**		**1570.00**		**5684.00**		**8561.00**		**1673.00**		**18953.00**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.9. Fisheries

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

4.9.1 Enhancement of fisheries production

Aquatic plants growing in ponds and lakes are beneficial for fish and wildlife. They provide food, dissolved oxygen, and spawning and nesting habitat for fish and waterfowl. Aquatic plants can trap excessive nutrients and detoxify chemicals. However, dense growths (over 25% of the surface area) of algae and other water plants can seriously interfere with pond recreation and threaten aquatic life. Water plants can restrict swimming, boating, fishing, and other water sports. Biological controls for aquatic vegetation have received considerable publicity. Several species of fish are herbivorous in that their principal diet is aquatic vegetation. One such species, the grass carp (also known as the white amur or Chinese carp), is being tested in various parts of the country. Hence in this district it is suggested to implement the biological control of aquatic weeds by stocking of Grass Carps in Aquatic Weed Infested water bodies.

Tremendous potential exists in India to augment fish production from freshwater aquaculture resources, which are spread across the length and breadth of the country. With concerted efforts to mobilize farmers to adopt fish farming, application of appropriate technologies for sustainable fish farming and fish seed production and availability of institutional finance, it would be possible to bring in substantial hikes in the annual fish production from the aquaculture sector within a span of 5 years. Hence in this district it suggested to implement the following intervention to enhance the production and growth of fisheries through Introduction of short seasonal fish species in existing farm ponds, Increasing fishing efficiency of inland Fishermen and fish farmers, Direct stocking of advanced fingerlings in irrigation tanks and panchayat tanks, Improvement of hygienic fish marketing by establishing modern fish stall/fish kiosk, Increasing safety at sea by providing life buoys/life jackets, Improvement of hygienic fish handling by providing ice boxes,

Resource enhancement by ranching of seeds in rivers and sea, Larvicolous fish seed production and Organization of fish festival.

4.9.2 Infrastructure and assets

Fish Farming is an age old activity and in practice from ancient times. The successful fish culture requires ploughing of pond, addition of manure, stocking of fish seed; eradication of unwanted aquatic plants and animals, watering the pond; harvesting the crop and marketing of the produce. The fish culture technologies and economics are simple and understandable to the fish farmers. Hence the construction of fish ponds in this district is recommended for its commercial production.

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. Hence it is necessary to install the artificial reefs in inshore areas and establishment of mini lab facilities in government fish farm of this district with budget cost of ₹100.00 lakhs

The handling, processing, and marketing of fish products are essential complementary functions of all food production systems. Marketing of fish products usually provides rural women with their source of income. In rural areas the customers become aware of a pond harvesting by informal contacts and buy their fish at the pond site. Most of the customers are women, who use the fish for home consumption or local marketing. The closer the market is to the farm, the fewer intermediaries and the greater the chance that women become actively involved in marketing aquatic products. Hence it is necessary to establish the modern mobile fish marketing vehicles in this district.

The establishment of domestic markets plays a very crucial role in the development of fisheries sector in the country. Apart from ensuring nutritional and food security, it also helps in minimizing post-harvest losses, increase revenue, enhance employment opportunities and offers high standards of hygiene and sanitation leading to food safety. The importance of domestic marketing can be understood from the fact that only about 15% of the total fish landing is utilized for export of fishery products and the remaining about 85% is distributed through domestic markets. As more and more trade restrictions are being imposed on the fishery product exports, a well-developed domestic marketing system only can ensure the viability of the fisheries sector. Hence it is necessary toestablish the GIFT farms and provision of inputs, increasing fish production in existing fish/shrimp farms by providing aerators and infrastructure and Repair and renovation of Government fish farms .

4.9.3. Capacity Building

Effective extension support is essential for the promotion of Aquaculture in freshwater and brackish water areas. It is necessary to establish the information centres/data dissemination centres in Fishermen villages, animation camps in fisheries villages, seminars, exhibitions and workshop, and awareness centres for linking the fishing villages, marketing centres and the district offices. Hence in this district it is necessary to give training to fish farmers, providing trainers training and exposure visits, Exposure visit to farmers to other states and providing Geo tube seawall and training wall to prevent in Coastal areas.

4.9.4. Budget

The budget requirement for fulfilling the above interventions is₹ **2767.12** lakhs

4.9.5. Implementing agency

Department of Fisheries will be implementing the project

Table 4.24. Budget Requirement for Fisheries

(₹in lakhs)

Sl. No	Fisheries	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
	Enhancement of fisheries															
1	Resource enhancement by ranching of seeds in rivers and sea	Nos	1	All Blocks	0	0.00	5	5.00	5	5.00	0	0.00	0	0.00	10	10.00
2	Larvivorous Fish Seed Production	No's	2	All Blocks	0	0.00	2	4.00	2	4.00	0	0.00	0	0.00	4	8.00
3	Introduction of short seasonal fish species in existing farm ponds	Ha	0.79	All Blocks	0	0.00	2	1.58	2	1.58	2	1.58	2	1.58	8	6.32
4	Installation of Artificial Reefs in The Inshore Areas of Tamil Nadu Coast (Unit)	Nos	25.00	All Blocks	0	0.00	1	25.00	1	25.00	1	25.00	1	25.00	4	100.00
5	Increasing safety at sea by providing life buoy/life jackets	Nos	0.0175	All Blocks	0	0.00	500	8.75	500	8.75	500	8.75	500	8.75	2000	35.00
6	Increasing fishing efficiency of inland fishermen and fish farmers	Nos	0.15	All Blocks	50	7.50	50	7.50	50	7.50	50	7.50	100	15.00	300	45.00
7	Increasing fish production in existing fish/shrimp farms by providing aerators and	Nos	3.35	All Blocks	0	0.00	5	16.75	5	16.75	5	16.75	5	16.75	20	67.00

Sl. No	Fisheries	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
	infrastructure															
8	Improvement of hygienic fish handling by providing ice boxes	Nos	0.065	All Blocks	0	0.00	50	3.25	50	3.25	50	3.25	50	3.25	200	13.00
9	Improvement of hygienic fish marketing by establishing modern fish stall/fish kiosk/	Nos	10	All Blocks	0	0.00	0	0.00	0	0.00	1	10.00	1	10.00	2	20.00
10	Establishment of GIFT farms and provision of inputs	Ha	5.05	All Blocks	0	0.00	2	10.10	2	10.10	2	10.10	2	10.10	8	40.40
11	Direct stocking of advanced fingerlings in irrigation tanks and panchayat tanks	Ha	0.04	All Blocks	0	0.00	1000	40.00	1000	40.00	1000	40.00	1000	40.00	4000	160.00
12	Biological Control of Aquatic Weeds by Stocking of Grass Carps in Aquatic Weed Infested water bodies	Ha	0.02	All Blocks	1000	20.00	0	0.00	0	0.00	0	0.00	0	0.00	1000	20.00
	Creation of infrastructure facilities															
13	Repair and renovation of Government fish farms (unit) 1.GOMUKHI, 2.	Nos	350	All Blocks	2	700.00	0	0.00	0	0.00	0	0.00	0	0.00	2	700.00

Sl. No	Fisheries	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
	THALANGADU															
14	Encouraging fish culture by establishment of fish culture ponds and provision inputs	Ha	2.1	All Blocks	5	10.50	8	16.80	10	21.00	12	25.20	15	31.50	50	105.00
	Capacity building programme															
15	Establishment of modern mobile fish marketing vehicles	Nos	10	All Blocks	0	0.00	0	0.00	0	0.00	0	0.00	1	10.00	1	10.00
16	Exposure visit to farmers to other states	Nos	0.06	All Blocks	0	0.00	10	0.60	10	0.60	10	0.60	10	0.60	40	2.40
17	Organisation of Fish festival	Nos	5	All Blocks	0	0.00	1	5.00	1	5.00	1	5.00	1	5.00	4	20.00
18	Providing Geo tube seawall and training wall to prevent in Coastal areas of Tamil Nadu	Nos	400	All Blocks	2	800.00	0	0.00	0	0.00	0	0.00	0	0.00	2	800.00
19	Providing trainers training and exposure visit to Departmental staff	Nos	0.1	All Blocks	0	0.00	5	0.50	5	0.50	5	0.50	5	0.50	20	2.00
20	Training to fish farmers	Nos	0.03	All Blocks	0	0.00	25	0.75	25	0.75	25	0.75	25	0.75	100	3.00

Sl. No	Fisheries	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
21	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	Nos	300	All Blocks	0	0	0	0	0	0	0	0	2	600	2	600
	Grand Total					**1538.00**		**145.58**		**149.78**		**154.98**		**778.78**		**2767.12**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

4.10 Fisheries Research (TNFU)

Tamil Nadu Fisheries University (TNFU) is the State funded, unitary professional Fisheries University in India imparting education, research and training to enhance fish production and utilization by following the State Agricultural University (SAU) pattern and syllabi. The prominent area of research in the area of aquaculture are: improving the quality of progeny by developing sperm bank, development of techniques for the culture of fin fishes in cages, enhancing the water use efficiency and productivity by bio-floc technology, developing the improved methods of ornamental fish culture and breeding techniques and inventing techniques to prevent and cure fish diseases. Stock assessment of important fishery resources, mapping the fauna and understanding the biology of commercially important and rare species, coastal area and inland waters monitoring for the major pollutants and waste water management are the focus areas of research. Value addition to fish has been a major focus area and technologies for fish pickle, fish noodles and ready to eat products like fish curry, fish puff, fish cutlet and fish burger have been evolved. Quality control wing of fish processing has evolved several rapid techniques for detection of human pathogens. A separate laboratory for quality monitoring will be built to help the industry.

Establishment of Advanced Hatchery Facility for Pangas, *Pangasianodon hypophthalmus* (Sauvage, 1878)

Pangasianodon hypophthalmus is one of the major fish species and one of the largest and most important inland fisheries in the world. (Food and Agriculture Organization of the United Nations).Pangas catfish (*Pangasianodon hypophthalamus*) are popular among catfish producers in India. It is the only catfish species that is widely used in commercial aquaculture across the country. Production of the fish as an ornamental species for the aquarium trade where it is sold at a small size and marketed as the iridescent or mystic shark. Initially, its culture was carried out in Andhra Pradesh and West Bengal in private sector but the Government of India permitted aquaculture of *P. hypophthalmus*in year 2010-2011. Mature fish can reach a maximum standard total length of 130 cm and up to 44 kg in weight. This species is benthopelagic, typically living within the ranges of pH 6.5-7.5 and 22-26°C. Females take at least three years to reach sexual maturity in captivity (being then over 3 kg in weight), while males often mature in their second year. The three most common on growing monoculture systems are earthen ponds, net cages and net pens. The culture of Pangasius (*Pangasianodonhypoththalmus*) has only increased during recent years. Among these species,

Pangasius were legally introduced during the last few years to supplement fish production. Pangasius has been used both for food as well as for ornamental purposes.

Establishment of Native fish Asylum-to protect, restore and river ranch the dwindling species such as *Labeocalbasu*, *L. bata*, *L. fimbriatus*, *Anabas* and other minor carps

Tamil Nadu ranks 8th place in inland fish production in India (1.85 Lakh MTs). The inland fisheries sector has about 3.73 lakh ha. of water spread area with nearly 2.23 lakh inland fisherman directly depending on this sector for their livelihood. Diversification of agricultural activities for increased production, employment and income is well - known. Likewise, aquacultural activities also increased fish production and economical status. Fish seeds and broodstock quality, Monsoon failure affects the inland fish production. Introduction of Gangetic carps (catla, rohu, mrigal) in inland waters affected the minor carps. Hence, minor carps restoration and production must be done to improve TN fish production.

Native fish species form a major component of food consumed by families, especially those living closer to freshwater resources. Some species available and amenable for diversified in freshwater aquaculture are *Labeocabasu*, *L.bata*, *L.gonius*, *L.fimbriatus*, *Puntiussarana*, *Mystusgulio*, *Anabas testudineus*, *Clariasbatrachus*, *H.fossilis*, *Pangasiuspangasius Channamarulius* and *Etroplussuratensis*. These species are a rich source of nutrition for the rural poor either on a seasonal basis or round the year. Small indigenous species enhancing rural food and livelihood security. These native species are considered as low volume and high value fish species.

Interventions

a) Establishment of regional labs for disease diagnosis, water qaulity and aquatic animal health management
b) Awareness to fishers on hygienic handling of fish
c) Creation of awareness among fishers on fish processing technologies
d) Capacity building and skill development programmes on fish processing technologies
e) Production of short films on nutritive value of fish and screening in theatres and television channels
f) Ensuring nutritional security through fish and fishery products
g) Utilization of fish processing waste and by catch

h) Establishment of trap setting vessel to impart eco friendly fish trapping technology among the fishermen of Tamil Nadu
i) Development of mobile gadgets/apps for remote monitoring system for aquaculture farms

Overall budget

The projects on research infrastructure and development will be implemented with a budget out lay of Rs**. 1671.45** lakhs**.**

Project implementing agency

Department of Fisheries will be implementing the project

Table 4.25. Budget requirement for Fisheries Research

(₹in lakhs)

Sl. No	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
i	**Aquatic animal health and management**														
a	Establishment of regional labs for disease diagnosis, water qaulity and aquatic animal health management	150	Villupuram	1	150.00	0	0.00	0	0.00	0	0.00	0	0.00	1	150.00
1	**Harvest and Post harvest**														
i	**fish processing technology**														
a	**Reduction of post harvest losses**														
	Awareness to fishers on hygienic handling of fish	0.005	Villupuram	133	0.67	133	0.67	133	0.67	133	0.67	133	0.67	665	3.35
	Creation of awareness among fishers on fish processing technologies	0.6	Villupuram	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	Villupuram	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	Villupuram	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	Villupuram	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00	1	50.00
c	**Ensuring nutritional security through fish and fishery products**														

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
	supply of preserved ready to eat and ready to cook fish products through public distribution sytems	12.9	Villupuram	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	Villupuram	0	0.00	1	12.90	0	0.00	0	0.00	0	0.00	1	12.90
	Supply chain management to promote consumption of farmed freshwater fishes	64.5	Villupuram	0	0.00	1	64.50	0	0.00	0	0.00	0	0.00	1	64.50
d	**Utilization of fish processing waste and by catch**														
	installation of waste rendering plant at selected fishing harbors and fish markets	130	Villupuram	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	Villupuram	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	Villupuram	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	Villupuram	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	Villupuram	1	300.00	0	0.00	0	0.00	0	0.00	0	0.00	1	300.00
2	**Fisheries Engineering**														
i	**Aquacultural engineering**														
a	**Farm implements**														

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
	Design and development of e interface gadgets for sustainable aquaculture	20	Villupuram	0	0.00	1	20.00	0	0.00	0	0.00	0	0.00	1	20.00
b	**Harvesters**														
	Design and development of synchronised harvester for freshwater aquaculture	30	Villupuram	0	0.00	0	0.00	1	30.00	0	0.00	0	0.00	1	30.00
c	**Automation technologies**														
	Development of mobile gadgets/apps for remote monitoring system for aquaculture farms	15	Villupuram	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	Villupuram	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	Villupuram	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	Villupuram	1	2.00	1	2.00	1	2.00	1	2.00	0	0.00	4	8.00
b	**Processing machines**														
	Design and development of gadgets for fish processing	20	Villupuram	0	0.00	0	0.00	0	0.00	1	20.00	0	0.00	1	20.00
	Grand total				**568.73**		**670.53**		**198.73**		**123.73**		**109.73**		**1671.45**

4.11. Increasing the ground water level

The artificial recharge to ground water aims at augmentation of ground water reservoir by modifying the natural movement of surface water utilizing suitable civil construction techniques. Artificial recharge techniques normally address to following issues - (i) to enhance the sustainable yield in areas where over-development has depleted the aquifer. (ii) Conservation and storage of excess surface water for future requirements, since these requirements often changes within a season or a period. (iii) To improve the quality of existing ground water through dilution. The sub-surface reservoirs are very attractive and technically feasible alternatives for storing surplus monsoon run off. The structures required for recharging ground water reservoirs are of small dimensions and cost effective, such as check dams, percolation tanks, surface spreading basins, pits, subsurface dykes etc. The artificial recharge projects are site specific and even the replication of the techniques from similar areas are to be based on the local hydrogeological and hydrological environments. Hence, to raise the water table level, artificial recharge structures and construction of check dams need to be taken up in canals to increase the storage capacity of the tanks and increasing the ground water table in and around area of check dams and there by crop cultivation area in tank ayacut area can be increased.

Project components

- Construction of an Artificial Recharging structure across in different rivers
- Construction of check dams across the rivers

Budget

It is proposed to incur **₹33.53 crores** over a period of five years

Expected outcome

The project will increase the Ground water table level and carrying capacity of canals during the heavy rain period and increasing the ground water table in and around area of check dams thereby increasing the crop cultivation area.

Implementing agency

Department of Public Works will be implementing the project

Table 4.26. Budget Requirement for PWD Works

(₹in lakhs)

Sl. No.	Intervention	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Construction of an Artificial Recharging structure across muktha river near SF No.87 of Eduttavainatham village of chinnasalemtaluk of villupuram district	Kallakurichi	Ha	3.96	50.51	200.00	0	0.00	0	0.00	0	0.00	0	0.00	50.51	200.00
2	Construction of an artificial recharging structure across Thondiyar river in Melchithamur Village near Vilukkam of GingeeTaluk of Villupuram District	Vallam	Ha	10.8	15.28	165.00	0	0.00	0	0.00	0	0.00	0	0.00	15.28	165.00
3	Construction of an artificial recharging structure across varaganadhi in S.F.No.117 of Elaiyandipattu village(VanurTaluk) and Madurapakkam village(VillupuramTaluk) of Villupuram district	Vanur	Ha	9.53	0	0.00	141.7	1350.00	0	0.00	0	0.00	0	0.00	141.7	1350.00
4	Construction of a check dam across Nariyanodai near K.Kallakurichi village in Ulundurpettaluk of Villupuram District.	Thirunavalur	Ha	9.01	0	0.00	19.43	175.00	0	0.00	0	0.00	0	0.00	19.43	175.00
5	Construction of an anicut across Seshanadi near Sellur village to feed Padur and Kalavanur tanks in UlundurpetTaluk of Villupuram District	Ulundurpet	Ha	1.73	0	0.00	0	0.00	277.9	480.00	0	0.00	0	0.00	277.9	480.00

Sl. No.	Intervention	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
6	Construction of a Recharging structure across Nallavur river near Kiliyanur village in vanurtaluk of villupuram district	Vanur	Ha	19.92	0	0.00	0	0.00	13	259.00	0	0.00	0	0.00	13	259.00
7	Construction of a Recharging structure across Gadilam river in Kilakkumarudur village of Ulundurpet taluk in Villupuram District	Thirunavalur	Ha	4.91	0	0.00	0	0.00	0	0.00	61.13	300.00	0	0.00	61.13	300.00
8	Construction of an anicut cum artificial recharge structure across Pambaiyar river near Vakkur Madura Melpadi village to feed Kappiyampuliyurthangal in Vikravandi taluk of Villupuram district	Vikravandi	Ha	2.56	0	0.00	0	0.00	0	0.00	76.95	197.00	0	0.00	76.95	197.00
9	Construction of an Artificial Recharging structure across Mani nadhi in Pootai village of sankarapuramtaluk of Villupuram district	Sankarapuram	Ha	1.15	0	0.00	0	0.00	0	0.00	0	0.00	101.78	117.00	101.78	117.00
10	Construction of a check dam across Varaganadhi near Pakkam village in GingeeTaluk of Villupuram District	Gingee	Ha	10.68	0	0.00	0	0.00	0	0.00	0	0.00	10.3	110.00	10.3	110.00
	Total					**365.00**		**1525.00**		**739.00**		**497.00**		**227.00**		**3353.00**

4.12. Agriculture Cooperation

Cooperatives all over the world have become an effective and potential instrument of economic development. The Cooperative Movement in Tamil Nadu has witnessed over the decades substantial growth in diverse areas of economy. There is not a single major sphere 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, and price support for agricultural commodities through Cooperative Wholesale stores, Public Distribution system etc., from a small beginning, the Cooperative movement in Tamil Nadu has grown in strength over the years. From Agricultural Banks to Marketing societies and Consumer Cooperatives provide service to the people in various economic activities. Cooperatives also run the Public Distribution system which provides relief to each and every family in the state.

Project components

a) infrastructure development
b) Capital Asset Creation

Budget

It is proposed to incur **₹.738** lakhs over a period of five years

Expected outcome

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

Implementing agency

Department of Agriculture Cooperation will be implementing the project.

Table.4.27 Budget for Cooperation

(₹. in lakhs)

Sl. No	Co-operation	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
			Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Construction of Compound wall	B1,B2,B3,B7, B8,B9,B13, B18,B19	8	69.89	9	90.65	9	111.3	8	71.45	8	75.95	42	419.24
2	Construction of Office Building	B16,B17	1	20.00	1	20.00	0	0.00	0	0.00	0	0.00	2	40.00
3	Renovation of Office Building	B1,B2,B3,B7,B 8,B9,B11,B13, B17,B18,B19	11	86.00	5	33.00	4	33.25	4	45.96	6	33.75	30	231.96
4	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 machine, Conveyer, E-Tender process, Fork Lifter, Gunny Bag Stitching machine, Jewel tester, Pallets, Tarpaulin, Trolley and Printing Press machineries)	All Blocks	2	7.80	2	7.80	2	7.80	3	11.70	3	11.70	12	46.80
	Total			**183.69**		**151.45**		**152.35**		**129.11**		**121.40**		**738.00**

Chinnasalem-B1, Gingee-B2, Kallakurichi-B3, Kanai –B4, Kandamangalam-B5, Koliyanur –B6, Mailam –B7, Marakkanam-B8, Melmalaiyur-B9, Mugiaur –B10, Olakkur-B11, Rishivandiyam –B12, Sangarapuram-B13, Thirukovilur –B14, Thirunavalur-B15, Thiruvennainallur-B16, Thiyagadurgam-B17, Ulundurpet-B18, Vallam-B19, Vanur-B20, Vellimalai-B21, Vikkiravandi-B22

Table 4.28. Budget Abstract for Villupuram District

(₹. in lakhs)

Sl. No	Sectors	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	20909.36	32071.94	30840.23	32649.08	35199.49	151670.10
2	Agriculture Research (TNAU)	31.00	500.00	0.00	50.00	0.00	581.00
3	Horticulture	15185.27	15047.61	15381.41	15720.71	17005.32	78340.32
4	Agricultural Engineering	3233.98	3235.75	2751.36	2739.19	2773.88	14734.16
5	Agricultural Marketing	881.41	299.29	1411.54	294.04	630.04	3516.32
6	Seed Certification and Organic certification	18.36	0.00	13.36	0.00	0.00	31.72
7	Animal Husbandry	3660.75	3737.75	3557.75	3277.75	3167.75	17401.75
8	Dairy Development	1465.00	1570.00	5684.00	8561.00	1673.00	18953.00
9	Fisheries	1538.00	145.58	149.78	154.98	178.78	2167.12
10	Fisheries Research (TNFU)	568.73	670.53	198.73	123.73	109.73	1671.45
11	PWD	365.00	1525.00	739.00	497.00	227.00	3353.00
12	Cooperation	183.69	151.45	152.35	129.11	121.40	738.00
	Grand total	**48040.55**	**58954.9**	**60879.51**	**64196.59**	**61086.39**	**293157.94**

The plan outlay for five years (2017-22) for Villupuram district is given in Table 4.28. Among the different activities, Agriculture sector requires huge financial outlay (**₹.**151670.10 lakhs) of the total plan outlay of ₹. 293157.94 lakhs. Greater emphasis has been given to increase the productive potential of Agricultural crops in Villupuram district.


KARNATAKA
KERALA
SRI LANKA