NATIONAL AGRICULTURE DEVELOPMENT PROGRAMME (NADP)

DISTRICT AGRICULTURE PLAN

THE NILIGIRIS

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

The Nilgiris district is situated in the north western part of the state in Western Ghats. The geographical area of the district is 2,544 square kilometers. It consists of six taluks namely Udhagamandalam, Kundah, Coonoor, Kotagiri, Gudalur and Pandalur. The up plateau at an altitude of 6,500 feet consists of four Taluks namely Udhagamandalam, Coonoor, Kotagiri and Kundah while Gudalur Taluk is the oldest plateau situated at altitude of 3000 feet. There are four panchayat unions in the district. The four Municipalities are Udhagamandalam, Coonoor, Gudalur and Nelliyalam. There are 11 special village Panchayats in this district. Wellington is the only cantonment in this District. The unique feature of the Nilgiris district is that about 56 per cent of the total area of the district is under forest. The population of the district according to 2011 census is 735071, of which 360170 are males and 374901 are females. The male literacy rate which is 82.14 (Rural 78.57; Urban 89.67) is higher than the female literacy rate of 65.46 (Rural 58.75; Urban 79.92).

The main soil type is lateritic red loam, the pH ranges from 3.9 to 7.5. Due to the receipt of adequate rainfall both during South West and North East monsoons and congenial agro-climatic conditions, foreign exchange earning crops like Tea and Coffee are grown on a large scale. Rainfall in the district varies considerably and ranges from 1063 to 2368.6 mm per annum, depending upon the altitude and topology of the place. The district has more advantages for more precipitation in the year of 2014-15 from normal rainfall. It has 2101.2 mm with more than for average of normal rainfall 1701.23 mm.The district comes under the influence of the South-West monsoon and North-East monsoon.

Plantation crops *viz.* Tea and Coffee occupy the major share among the all the crops. They are cultivated in an area of about 64084 ha. Next to this is the vegetable crop which accounts for an area of 6263 ha. Sub-tropical fruit crops and other non-food crops constitute 1069 ha and 1097 ha respectively. Flowers, medicinal plants, cereals and oil seeds are cultivated in some packets of the district with altogether area coverage of 565 ha.

The District Agricultural Plan prepared for the Nilgiris district identified various interventions/strategies to achieve a higher growth trajectory in agriculture and allied sectors. The major interventions suggested in different sectors are establishment of micro propagation unit and supply of disease free seed tubers of potato, promoting carrot, chow chow, beans and peas production, area expansion of exotic vegetables, promotion of sub-tropical and temperate fruit cultivation, organic tea cultivation, free distribution of cattle,

supply of fodder grass, supply of chaff cutter to the farmers, supply of milking machine to the farmers, biological control of Aquatic weeds, direct stocking of advanced fingerlings in irrigation tanks, supply of implements, construction of water harvesting structure, strengthening of Horticultural Research Station, post harvest infrastructure for Carrot, solar fencing, establishment of Value Addition Units, creation of a common cold storage facilities for storing vegetables and flowers and purchase of cold chain reefer vans.

Consolidated budget abstract for Nilgiris District

(₹. In lakhs)

Sl. No	Components	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	0.00	0.00	0.00	0.00	0.00	0.00
2	Agricultural Research (TNAU)	0.00	0.00	0.00	0.00	0.00	0.00
3	Horticulture	1928.98	1943.98	1943.98	1943.98	1943.98	9704.88
4	Agricultural Engineering	236.83	368.56	201.75	156.76	180.86	1144.74
5	Agricultural Marketing	127.00	542.00	221.00	32.00	39.00	961.00
6	Seed Certification & Organic Certification	**5.00**	**0.00**	**0.00**	**0.00**	**0.00**	**5.00**
7	Animal Husbandry	1440.55	1641.55	356.55	431.55	246.55	4116.75
8	Animal Science Research (TANUVAS)	0.00	0.00	0.00	0.00	0.00	0.00
9	Dairy Development	614.75	594.75	1889.75	794.75	569.75	4463.75
10	Fisheries	1.55	1.55	1.15	0.75	0.75	5.75
11	Fisheries Research (TNFU)	0.26	90.56	50.26	300.26	0.26	441.60
12	Water Resource Organization (PWD)	303.00	50.00	275.00	25.00	160.00	813.00
13	Civil Supplies & Co-Operation	2103.00	610.20	1079.07	2455.86	705.35	6953.48
	Grand total	**6760.92**	**5843.15**	**6018.51**	**6140.91**	**3846.50**	**28609.95**

The Total budget requirements (**Rs. 28609.95 lakhs**) for implementing these interventions in The Nilgiris district.

CHAPTER I

INTRODUCTION

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

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

Objectives of RKVY

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

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

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

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

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

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

District and State Agriculture Plans

As per the recent guidelines issued by the Government of India under Remunerative Approaches for Agriculture and Allied sector Rejuvenation

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

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

- The several states have already prepared Comprehensive District and State Agriculture plans for 12th Plan period. These plans have to be revised and updated appropriately for implementing RKVY-RAFTAAR during 14th Finance Commission keeping in view modification proposed for the plan period and emerging needs of the State.

- The District Agriculture Plan (DAP) shall not be however the usual aggregation of existing schemes but would aim at moving towards projecting the requirements for development of Agriculture and allied sectors of the district and for the State a whole.

- These plans would also present the vision for Agriculture and allied sectors within the overall development perspective of the district and further State as a whole.

- The District Agriculture Plans and the State level plan would also present their financial requirements in addition to sources of financing the agriculture development plans in a comprehensive way.

- The District Agriculture Plan will include animal husbandry and fishery development, minor irrigation projects, rural development works, agricultural marketing schemes and etc. keeping in view the natural resources and technological possibilities in each district.

- District level potential linked credit plans (PLP) already prepared by the National Bank for Agriculture and Rural Development (NABARD) and Strategic Research and Extension Plans (SREP) developed under the Agricultural Technology Management Agency (ATMA) etc. may be referred for revision of DAPs.

- It should also be ensured that the strategies for convergences with other programs as well as the role assigned to the Panchayati Raj Institutions (PRIs) are appropriately incorporated in DAPs.

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

The Process

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

Revision and Updation of DAP and SAP in Tamil Nadu

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

Methodology followed

The revision of the District Agricultural Plan of The Nilgiris 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.

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CHAPTER II

PROFILE OF THE DISTRICT

The Nilgiris district which forms part of Tamil Nadu, in Sanskrit the Nilgiris means “Blue mountains” and in Tamil “Neelamalai”. The Nilgiris district is situated at an elevation of 900 to 2636 meters above MSL. Approximately 65% of the geographical area of this district lies at an altitude of above 1800-2500 meters above MSL and the remaining 35% at lower altitude. The climate is temperate to sub-tropical. The average annual rainfall ranges from 950 to 1550 mm.

The Nilgiris district is situated in the north western part of the state and Western Ghats. It differs considerably from its neighboring districts in respect of agro-climatic conditions. The Nilgiris district is surrounded by Coimbatore and Periyar districts, Kerala state and Karnataka state on the eastern, western and the northern side respectively. The district is a summer resort for the tourists from the entire world. Udhagamandalam the capital of the Nilgiris has been once the venue of Tamil Nadu Legislative Assembly.

2.1 Area, Location and Geographical features

The Geographical area of the district is 2,544 square kilometers. It consists of six taluks namely Udhagamandalam, Kundah, Coonoor, Kotagiri, Gudalur and Pandalur. The up plateau at an altitude of 6,500 feet consists of four Taluks namely Udhagamandalam, Coonoor, Kotagiri and Kundah while Gudalur Taluk which is the oldest plateau is at altitude of 3000 feet. There are four panchayat unions in the district.The fourmunicipalities are Udhagamandalam, Coonoor, Gudalur and Nelliyalam. There are 11 special village panchayats in this district. Wellington is the only cantonment in thisDistrict.The unique feature of the Nilgiris district is that about 56% of the total area of the district is under forest.

The Nilgiris is a tiny district on the Western Ghats located between $11^0$10 and $11^0$45 N latitude and $76^0$14 and $77^0$2 E longitude. The topography of this district is rolling and steep. About 60% of the cultivable land falls under the slope ranging from 10 to 33%. Nilgiris, being basically a Horticultural District, the entire economy depends on the success and failure of horticulture crops like potato, cabbage, tea, coffee, spices and fruits. The total geographical area is 2, 54,381 ha.

2.2 Administrative Structure of the Nilgiris district

The administrative structure of the district is furnished in the Table 2.1. The district comprises six taluks; *viz.,* Ootacamund, Kundah, Coonoor, Kotagiri, Gudalur and Pandalur. These are divided among four Panchayat Unions; *viz.,* Udhagamandalam, Coonoor, Kotagiri and Gudalur, besides four Municipalities, Wellington Cantonment and Aruvankadu Township. The District consists of 54 revenue villages and 21 town panchayat. There are two revenue divisions here, Coonoor and Gudalur. For local concerns the Nilgiris also has 54 village panchayats and 4 municipalities. There are 4 blocks in the district *viz.,* Udhagamandalam, Coonoor, Gudalur and Kotagiri.

Table 2.1 Administrative structure of the district

Sl.No	Name of the Blocks	Profile of the district
1.	Udhagamandalam	Revenue Division - 2
2.	Coonoor	Municipalities - 4
3.	Gudalur	Panchayat Unions - 4
4.	Kotagiri	Village Panchayats - 54
		Revenue Villages - 54
		Town Panchayat- 21

Udhagamandalam Block

Udhagamandalam block is located at an elevation ranging from 950 m to 2200 m from MSL. The maximum temperature ranges from 16.6 to 28°C and the minimum temperature ranges from 0° to 9°C during the winter months of November to February. The source of irrigation mainly depends on the summer showers, South West and North East monsoons.

The average annual rainfall ranges from 900 mm to 2000 mm of which about 30% is received during the South West monsoon period. The incessant rains throughout the seasons leads to the formation of rivers like Bavani, Moyar, Kundha, Pykara and various other streams supplement water for drinking and irrigation. Pykara, Moyar and Kundha rivers contribute for the hydro-electric projects enhancing the socio-economic status of the state.

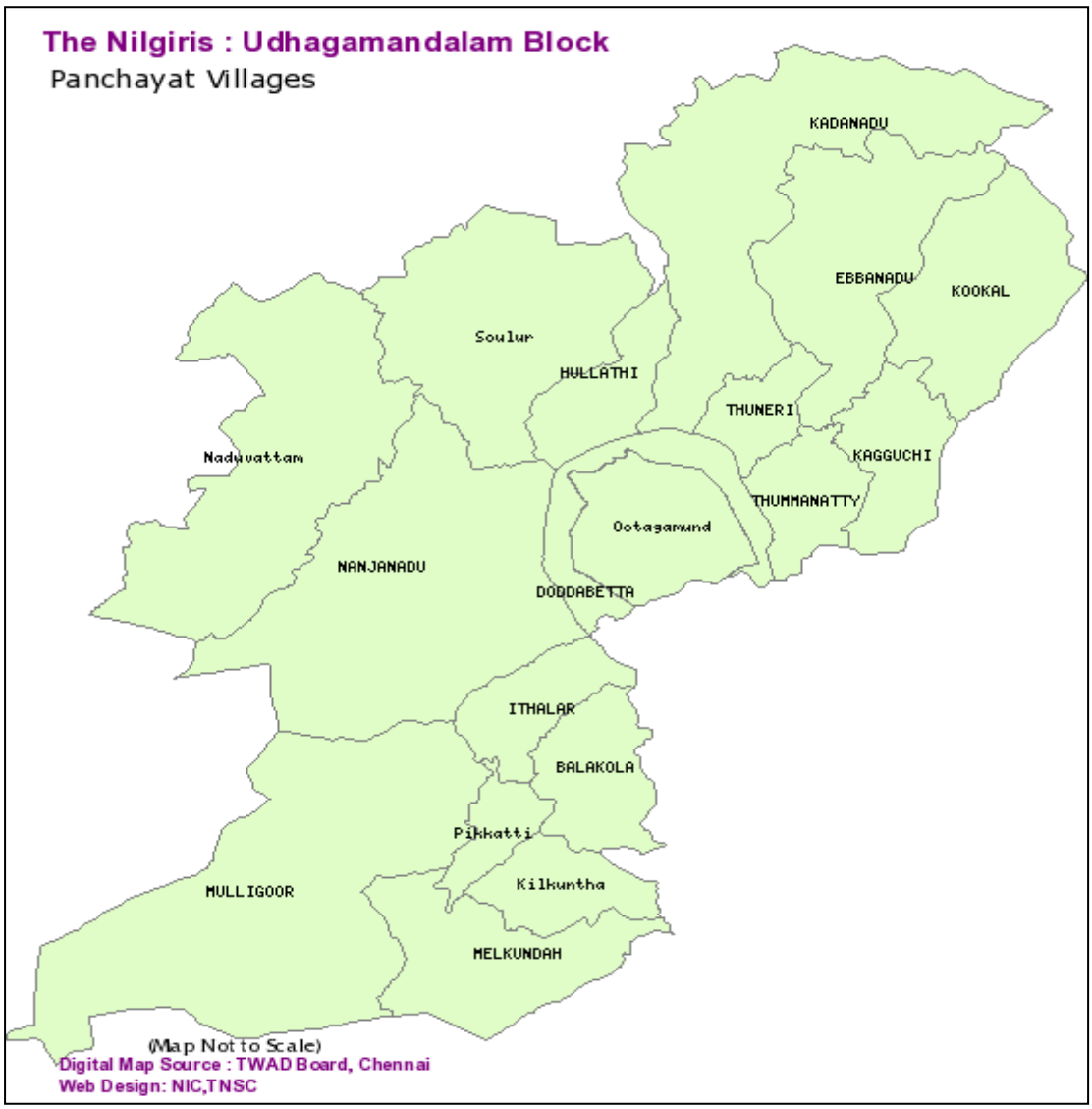

Fig. 1 Map Showing the Udhagamandalam block of the Nilgiris District

There are three distinct agro climatic regions.

- The Thuneri firka which is a rain shadow area.
- The Kundha firka which receives moderate rainfall.
- Udhagamandalam urban area which receives heavy rainfall.

The predominant soils of this block are lateritic loam of kaolinite origin. The fertility status of the soil is medium to high with limitation of nutrition retention capacity due to its loose and friable structure and topography. The soil reaction is acidic and the pH ranges from 3.8 to 6.2. Due to this acidic condition most of the applied phosphorus is fixed in the soil and not readily available to the crops.

Coonoor Block

Coonoor block is situated in eastern part of the Nilgiris District with elevation ranging from 4000 feet to 6000 feet above mean sea level. The average rainfall ranges from 1200 mm to 1500 mm. It receives rain mostly in the North Eastern Monsoon. The temperature ranges from 20°C to 28°C in summer and from 0°C to 15° during winter. Slight ground frost is noticed during December and January. The relative humidity ranges from 85% to 100%. Wells continue to be the major source of irrigation. Plantation crops like tea and coffee, hill vegetables like potato, cabbage and carrot and temperate fruits like plum, pear, peach and mandarin orange are being grown in the block.

Fig. 2 Map Showing the coonoor block of the Nilgiris District

KotagiriBlock

Kotagiri block comes under two taluks in the Nilgiris. It comprises 14 revenue villages in Kotagiri taluk and Kukal Revenue Village in Ooty taluk. It is surrounded by Erode district in the North and East, Coonoor and Ooty Taluks in the west and Coimbatore district in the South.

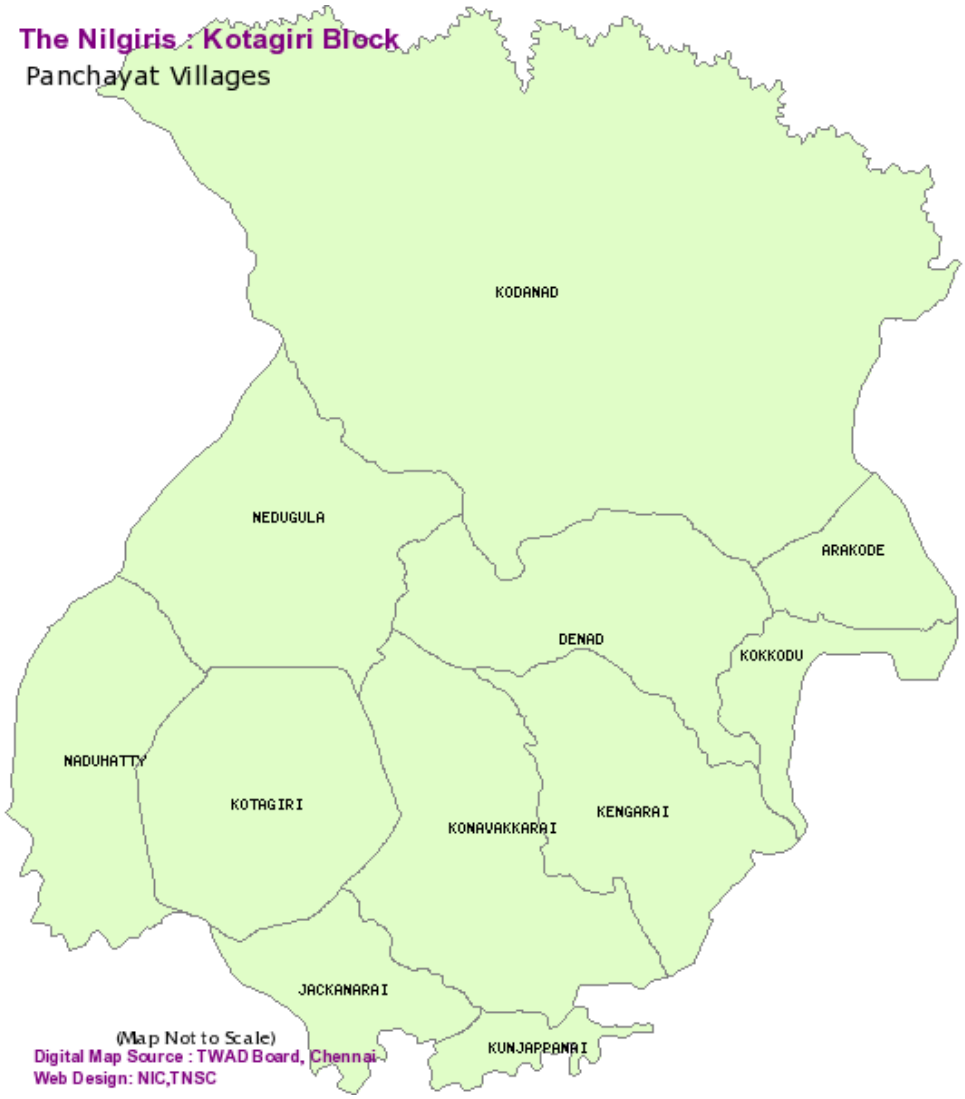

Fig. 3 Map Showing the Kotagiri block of the Nilgiris District

The average rainfall of this sub division is 1210.5 mm in 75 rainy days. The maximum temperature ranges from 10°C to 30°C and the minimum temperature ranges from 2°C to 14°C. The main soil type is lateritic red loam, the pH ranges from 3.9 to 7.5. Due to the receipt of adequate rainfall both during South West and North East monsoons and congenial agro-climatic conditions, foreign exchange earning crops like tea and

coffee are grown on a large scale. The main crops cultivated in this tract are tea, coffee and fruits like pear, mandarin orange and hill vegetables like potato, cabbage, carrot, beans and minor vegetables like beetroot, turnips and knolkhol. Thengumarahada village forms part of Kotagiri Taluk. Due to the tropical climate prevailing there, crops like paddy, groundnut, soya bean and marigold are cultivated. Spice crops like pepper is being introduced in this sub division.

Gudalur Block

Gudalur block forms a part of Nilgiris District meeting on the Western Ghatsat a distance of 50 km from Ooty on the way to Mysore and Kozhikode. It is mainly a hilly region with flat lands enjoying a salubrious climate of sub tropic during most part of the year. The elevation is from 950 to 1500 m. The total geographical area of Gudalur taluk is 72,171 hectares of which 53.0% under forest and uncultivable land and 56.0% cultivable area.

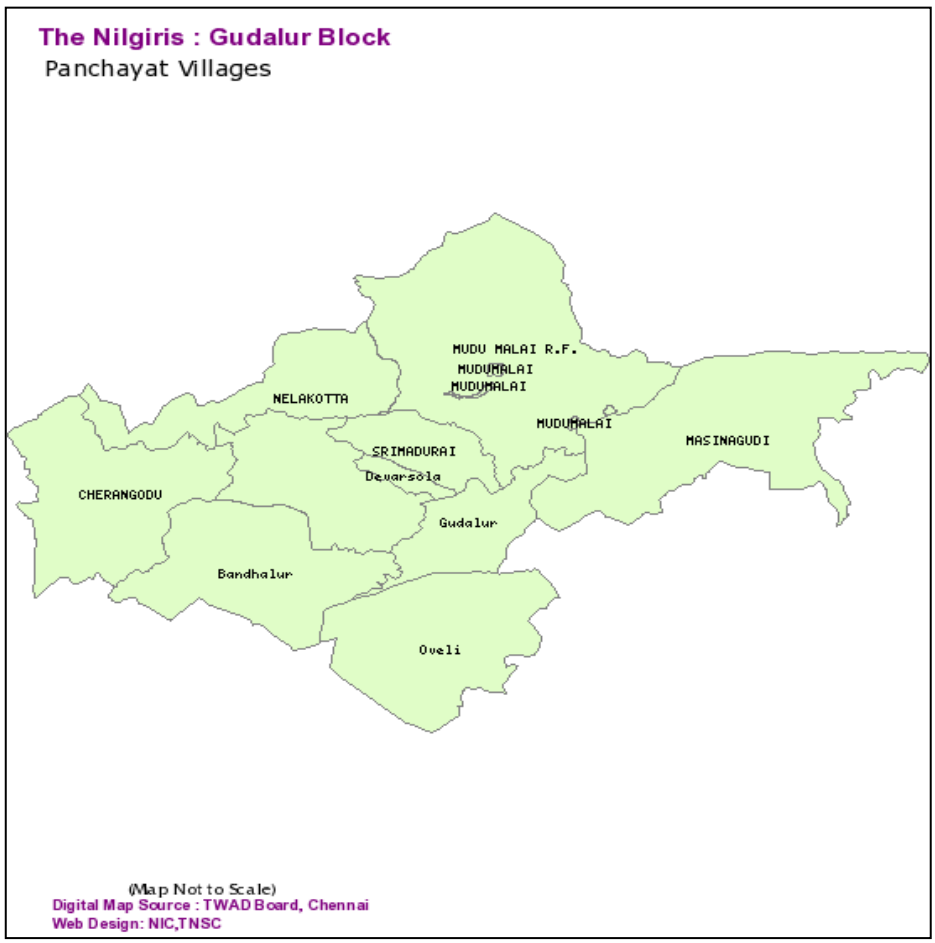

Fig. 4 Map Showing the Gudalur block of the Nilgiris District

Out of the total cultivated area, 65.7% is under perennial and 14.3% is under annuals. The normal rainfall is 2300 mm per annum. While 75% of the rain is received during the South west monsoon, contribution of North east monsoon is only 15% to the total of rainfall and 8% of the rains are received during the hot weather and 2% during the winter.

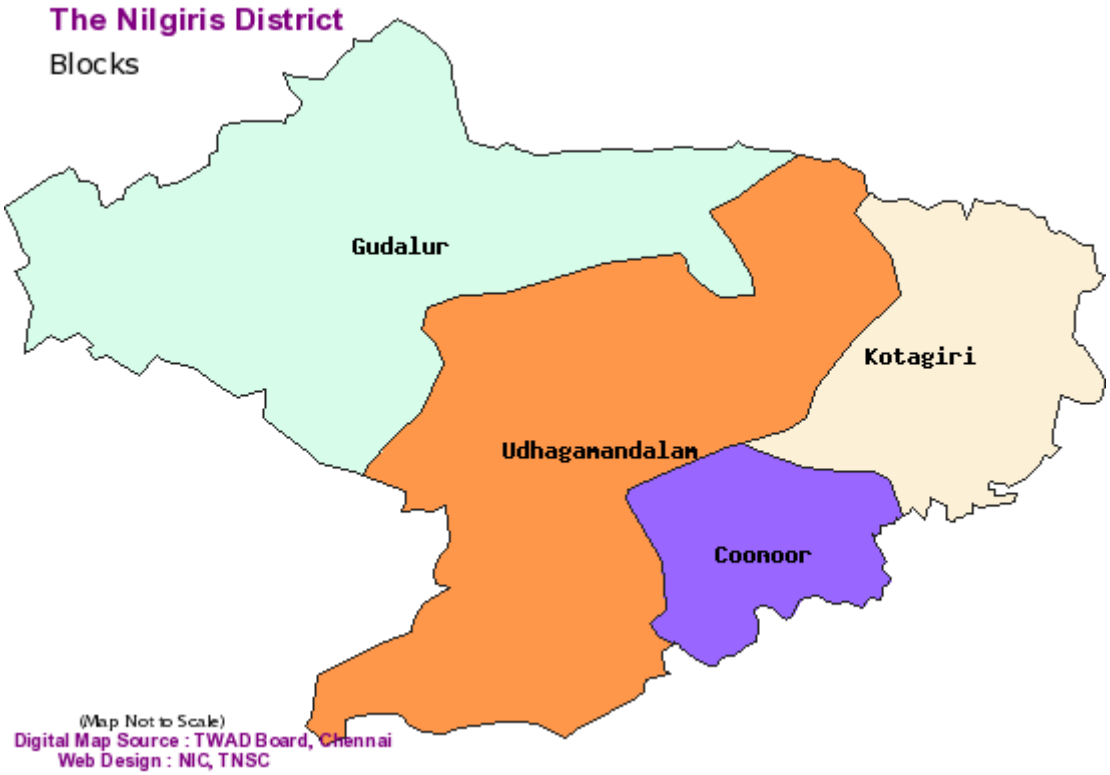

Fig. 5 Map Showing the blocks of the Nilgiris District

2.3 Demographic profile

2.3.1 Population

The total population in the blocks is given in the Table 2.2.

The block wise population of the district according to 2011 census is 3,10,591, of which 1,51,144 are males and 1,59,447 are females. The block wise SC and ST population is 91,446 and 22,767 respectively.

Table 2.2 Total population of the district (block wise)

Sl. No.	Name of block	No. of Village	Total population	Total Male	Total Female	Total SC	SC Male	SC Female	Total ST	ST Male	ST Female
1	Udhagamandalam	13	1,08,054	52,468	55,586	29,820	14,738	15,082	3,015	1,490	1,525
2	Coonoor	6	37,983	18,346	19,637	16,995	8,282	8,713	944	482	462
3	Kotagiri	11	66,094	32,157	33,937	18,713	9,173	9,540	6,197	3,045	3,152
4	Gudalur	5	98,460	48,173	50,287	25,918	12,786	13,132	12,611	6,159	6,452
	Grand Total	**35**	**3,10,591**	**1,51,144**	**1,59,447**	**91,446**	**44,979**	**46,467**	**22,767**	**11,176**	**11,591**

Source: Census of India, Directorate of Census Operations, 2011

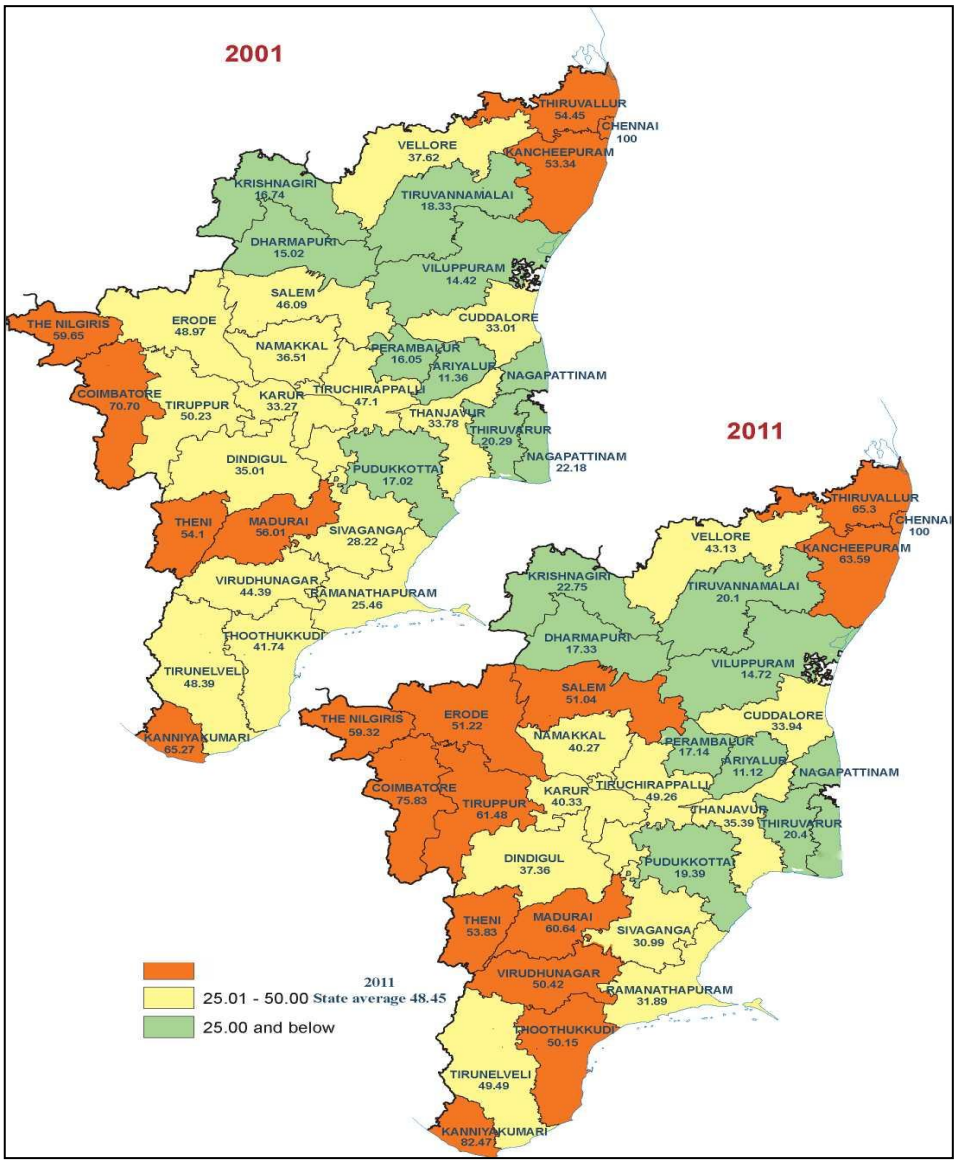

Fig. 6 Map showing the difference in population (2001 & 2011)

Table 2.3 Population in the district (2011)

Description	2011	2001
Actual Population	735,394	762,141
Male	360,143	378,351
Female	375,251	383,790
Population Growth	-3.51%	7.31%
Area Sq. Km	2,549	2,549
Density/km^2	287	299
Proportion to Tamil Nadu Population	1.02%	1.22%
Sex Ratio (Per 1000)	1042	1014
Child Sex Ratio (0-6 Age)	985	979
Average Literacy	85.20	80.01
Male Literacy	91.72	88.54
Female Literacy	78.98	71.64
Total Child Population (0-6 Age)	66,799	85,860
Male Population (0-6 Age)	33,648	43,383
Female Population (0-6 Age)	33,151	42,477
Literates	569,647	541,099
Male Literates	299,447	296,573
Female Literates	270,200	244,526
Child Proportion (0-6 Age)	9.08%	11.27%
Boys Proportion (0-6 Age)	9.34%	11.47%
Girls Proportion (0-6 Age)	8.83%	11.07%

Source: Census (2011), Directorate of Census Operations, Tamil Nadu

In 2011, The Nilgiris had population of 735,394 of which male and female were 360,143 and 375,251 respectively (Table 2.3). In 2001 census, The Nilgiris had a population of 762,141 of which males were 378,351 and remaining 383,790 were females. The Nilgiris District population constituted 1.02 percent of total Maharashtra population. In 2001 census, this figure for The Nilgiris District was at 1.22 percent of Maharashtra population.

There was change of -3.51 percent in the population compared to population as per 2001. In the previous census of India 2001, The Nilgiris District recorded increase of 7.31 percent to its population compared to 1991.

2.3.2 Literacy level

Table 2.4 Block wise literacy rate in the district (2009-10)

Sl. No	Name of the block	Total Literacy Rate		
		Male	Female	Total
1	Udhagamandalam	78921	62932	141853
2	Coonoor	72696	61164	133860
3	Kotagiri	43887	35073	78960
4	Gudalur	36507	31001	67608

Source: District profile, The Nilgiris (2010-11)

The literacy rate of the State as per the provisional Population Totals of census 2011 is 73.88. In the rural areas the literacy rate is 68.74 and in urban areas it is 84.75.

The male literacy rate which is 82.14 (Rural 78.57; Urban 89.67) is higher than the female literacy rate of 65.46 (Rural 58.75; Urban 79.92). It is significant to note that the literacy rate for the female in the district has to be increased in the coming years (Table 2.5)

Table 2.5 Literates and literacy rate in the district (2011)

Literates	Absolute		
	Total	Rural	Urban
Persons	422281	232011	190170
Males	221550.8	174008.3	47542.5
Females	200630.3	58002.75	142627.5

Source: Census of India, Director of Census Operations Tamil Nadu (2011)

2.3.3 Working population

The population and labour force in the Nilgiris District is given in the Table 2.6 below

Table 2.6 Populations by broad Industrial categories of Workers in Nilgiris District

S. No	Industrial Category	Nilgiris District		Tamil Nadu	
		Persons	% to total workers	Persons	% to total workers
1.	Total Main Workers	310064	90.30	23684611	85.00
2.	Marginal Workers	33321	9.70	4127036	15.00
	a)Cultivators	11410	3.32	5114384	18.00
	b)Agricultural laborer's	38775	11.29	8665020	31.00
	c)Household Industry manufacturing, processing, servicing and repairs	1656	0.48	1458546	5.00
	d) Other Workers	160927	46.86	12573697	45.00
3.	**Total Workers**	**343387**	**100.00**	**27811647**	**100.00**
4.	Non Workers	418754	0.00	34299192	0.00
5.	**Total Population**	**762141**	**0.00**	**62110839**	**0.00**

2.4 Topography

In Nilgiris District the topography is rolling and steep. About 60% of the cultivableand falls under the slopes ranging from 16 to 35%. The entire district is hilly and is divided into natural zones *viz.,* the Nilgiris plateau and the Wynad tablel and.Soils have been defined as a thin layer of earth's crust which serves as a natural medium for the

growth of plants. The soil formation may be classified into four varieties *viz.,*alluvial soil, laterite soil, black soil, and red soil. The district is prone to landslides and soil erosion during heavy rains. The major types of soil in the district are sandy loam, red loamy soil, and black soil seen in the dam and riverbed areas.Due to its altitudes, the climate in this district remains to the Maximum of 21^0 Cto 25^0 C and the minimum of 10^0 Cto 12^0 C during the summer. During the winter the maximum temperature ranges from 16^0C to 21^0 C and minimum temperature is 2^0 C.

2.4.1 Soil type

The main soil type is lateritic red loam, the pH ranges from 3.9 to 7.5. Due to the receipt of adequate rainfall both during South West and North East monsoons and congenial agro-climatic conditions, foreign exchange earning crops like Tea and Coffee are grown on a large scale. The districts predominant soil type is Laterite soil with a pH ranging from 4.00-6.50. There are eleven soil series encountered in the Nilgiris district and most of which occur as association with them. They are given below in Table 2.7 – 2.15 with their corresponding symbol, extent in hectare and in percent. The information's on fertility status, soil series of individual bocks are presented in the table.

Table 2.7 Soil series of Nilgiris district

Sl.No	Soil series	Symbol	Extent	
			Ha	%
1.	Millithenu series	Mtu	15229	5.97
2.	Nagalli series	Ngl	680	0.27
3.	Kaumpalam series	Kpm	439	0.17
4.	Hallimoyar	Hmr	390	0.15
5.	Kaumpalam+Nelliyalam	Kpm+Nym	42550	16.73
6.	Karumpalam+Millithenu	Kpm+Mtu	28371	11.15
7.	Karumpalam+Terremia	Kpm+Trm	17014	6.69
8.	Milithenu+Kaumpalam	Mtu+Kpm	10660	4.19
9.	Thalakundah+Valathottam	Tkd+Vtm	3971	1.56
10.	Kuchimuchi+Puthurvayal	Kmi+Pvl	3884	1.53
11.	Milithenu+Terremia	Mtu+Trm	3107	1.22
12.	Hallimoyar + Terremia	Hmr+Trm	2590	1.02
13.	Terremia+Karumpalam	Trm+Kpm	2460	0.97
14.	Attavalai+Terremia	Atv+Trm	2070	0.81
15.	Nelliyalam +Nagalli	Nym+Ngl	1839	0.72
16.	Nagalli+Nelliyalam	Ngl+Nym	1594	0.63
17.	Attavalai+Kaumpalam	Atr+Kpm	1030	0.40
18.	Forest	Atr+Kpm	116502	45.82
		Total	**254380**	**100.00**

Source: District Soil Atlas

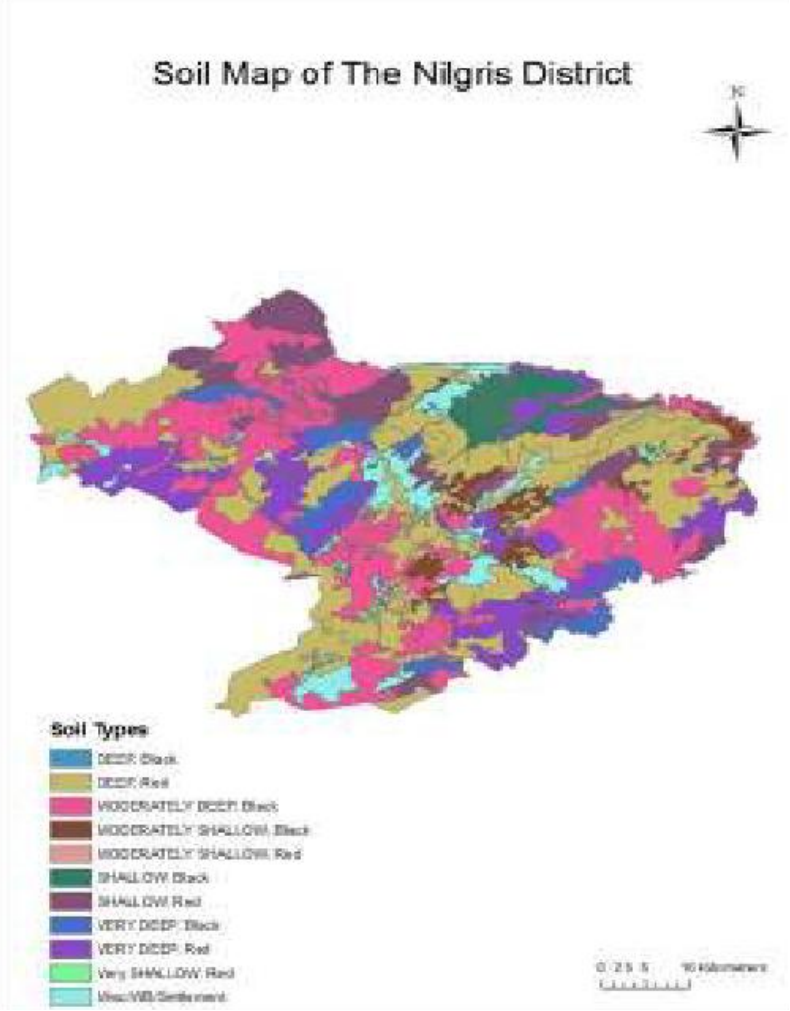

Fig.7 Map showing the soil types in the district

Table 2.8 Soil types of Udhagamandalam Block

Soil series	Extent	Percentage
Milithenu	5229	12.72
Karumpalam+Milithenu	8310	15.29
Thalakundah+Valathottam	2210	1.85
Karumpalam	439	0.35
Forest	83576	69.79
Total	**19764**	**100.00**

Table2.9 Village wise soil fertility status of Udhagamandalam Block

Name of the village	Fertility status (kg/ac)		
	Nitrogen	Phosphorus	Potassium
Masinagudi	Medium	High	Medium
Mulligor	High	High	Medium
Kilkundah	High	High	Medium
Melkundah	High	High	High
Balacola	High	High	Medium
Bikkatty	High	High	High
Ithalar	High	High	High
Nanjanad	High	High	High
Udhagamandalam	High	High	High
Thummanatty	High	High	High
Kagguchi	High	High	High
Kukal	High	High	High
Thuneri	High	High	High
Kadanad	High	High	High
Hullalli	High	High	High
Sholur	High	Medium	Medium
Naduvattam	High	Medium	Medium
Kinnakorai	High	High	High

Table 2.10 Soil types of Coonoor block

Soil series	Extent	Percentage
Karumpalam+Terremia	9456	41.57
MIlithenu+ kaumpalam	3640	16
Terremia +karumpalam	2250	9.89
Karumpalam +milithenu	1744	7.67
Attavalai+terremia	581	2.55
Hallimoyar	229	1.01
Forest and Hills	4881	21.31
Total	**22779**	**100**

Table2.11Village wise fertility status of Coonoor block

Name of the village	Fertility status (kg/ac)		
	Nitrogen	Phosphorus	Potassium
Helur	High	High	High
Hulical	High	High	High
Burliar	High	Medium	Medium
Yedapalli	High	High	Medium
Coonoor	High	High	Medium
Hubbahalai	High	High	High
Jagathala	High	High	High
Ketti	High	High	High
Adigavatly	High	High	High

Table 2.12 Soil types of Kotagiri Block

Soil series	Extent	Percentage
Karumpalam+Milithenu	5809	14.65
Karumpalam+Terremia	5213	13.14
Hallimoyar+Terremia	2493	6.28
Milithenu+Karumpalam	1845	4.65
Milithenu+Terremia	1471	3.71
Attavalai+terremia	1496	3.77
Attavalai+Kaumpalam	1059	2.67
Hallimoyar	75	0.19
Forest	20204	50.94
Total	**39665**	**100**

Table 2.13 Village wise soil fertility status of Kotagiri Block

Name of the village	Fertility status (kg/ac)		
	Nitrogen	Phosphorus	Potassium
Naduhatty	High	High	High
Kotagiri	High	High	High
Jakkanarai	High	High	High
Kangan	High	High	High
Kadinamalai	High	High	Medium

Name of the village	Fertility status (kg/ac)		
	Nitrogen	Phosphorus	Potassium
Arakodu	High	High	Medium
Denad	High	High	High
Nandipuram	High	High	High
Thengumarada	High	Medium	Medium
Kodanad	High	High	High
Nedugula	High	High	High
Konakkarai	High	High	High

Table 2.14 Soil types of Gudalur block

Soil series	Extent	Percentage
Valathottam	680	0.95
Naglli+ nelliyalam	1554	2.10
Nelliyalam+Nagalli	1838	2.55
Kuchimuchi+ Puthurvayal	3884	5.40
Karumpalam +Nelliyalam	42550	59
Forest	21666	30
Total	**72208**	**100**

Table 2.15 Village wise fertility status of Gudalur block

Name of the village	Fertility status (kg/ac)		
	Nitrogen	Phosphorus	Potassium
Erumad	High	Medium	Low
Churangod	High	Medium	Low
Nelliyalam	High	Low	Low
Munnadu	High	Low	Medium
Devala	High	Medium	Medium
O' Valley	High	Medium	Medium
Gudalur	High	Low	Low
Mudumalai	High	Medium	Medium
Srimadurai	High	Low	Low
Cherumulli	High	Low	Low
Padantharai	High	Low	Low
Nellakkottai	High	Low	Low

2.5 Climatic condition and Rainfall

The average annual rainfall ranges from 950 to 1550 mm. The Nilgiris district occupies a unique position as a hill station in the sense that this hill ranges, though situated in the tropical belt, enjoys temperate climate because of its altitude. The district has different climatic condition such as Tropical, Sub-tropical and Temperate. The district experiences an average minimum and maximum temperature of 2^0 C and 32^0 C. The entire district is a hilly region with a minimum and maximum height of 800 meters and 2595 meters above mean sea level respectively.

Rainfall in the district varies considerably and ranges from 1522.7 to 2101.2 mm per annum, depending upon the altitude and topology of the place. The district comes under the influence of the South-West monsoon (1013.3 mm) and followed by North-East monsoon (580.9 mm). The lowest quantity of rainfall received was recorded during the winter season (1.5 mm). The detail of quantity of rainfall received is presented in the Table 2.16.

Table 2.16 Month wise / season wise rainfall distribution in Nilgiris District

Season / Month	2014-15	
	Normal(mm)	Actual(mm)
South West Monsoon		
June	169.8	97.1
July	260.8	328.6
August	180.8	295.7
September	148.4	291.9
Total	**759.8 (48.94)**	**1013.3 (48.22)**
North East Monsoon		
October	217.9	348.7
November	181.2	137.4
December	79.1	94.8
Total	**478.2 (31.40)**	**580.9 (27.65)**
Winter Season		
January	23.1	1.2
February	26.2	0.3
Total	**49.3 (3.24)**	**1.5 (0.07)**
Hot Weather		
March	35.6	137.3
April	82.4	140.5
May	117.3	227.7
Total	**235.3 (15.15)**	**505.5 (24.06)**
Annual rainfall	**1522.7 (100.00)**	**2101.2 (100.00)**

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

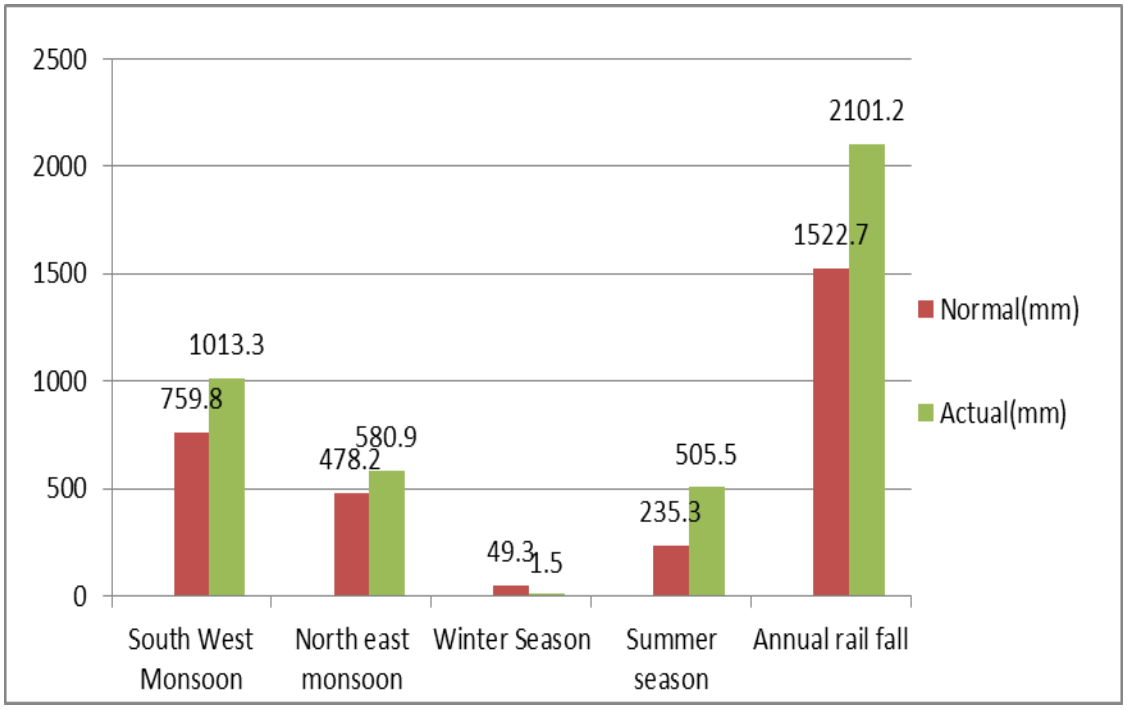

Fig. 8 Season wise Average Rainfall (2014-15)

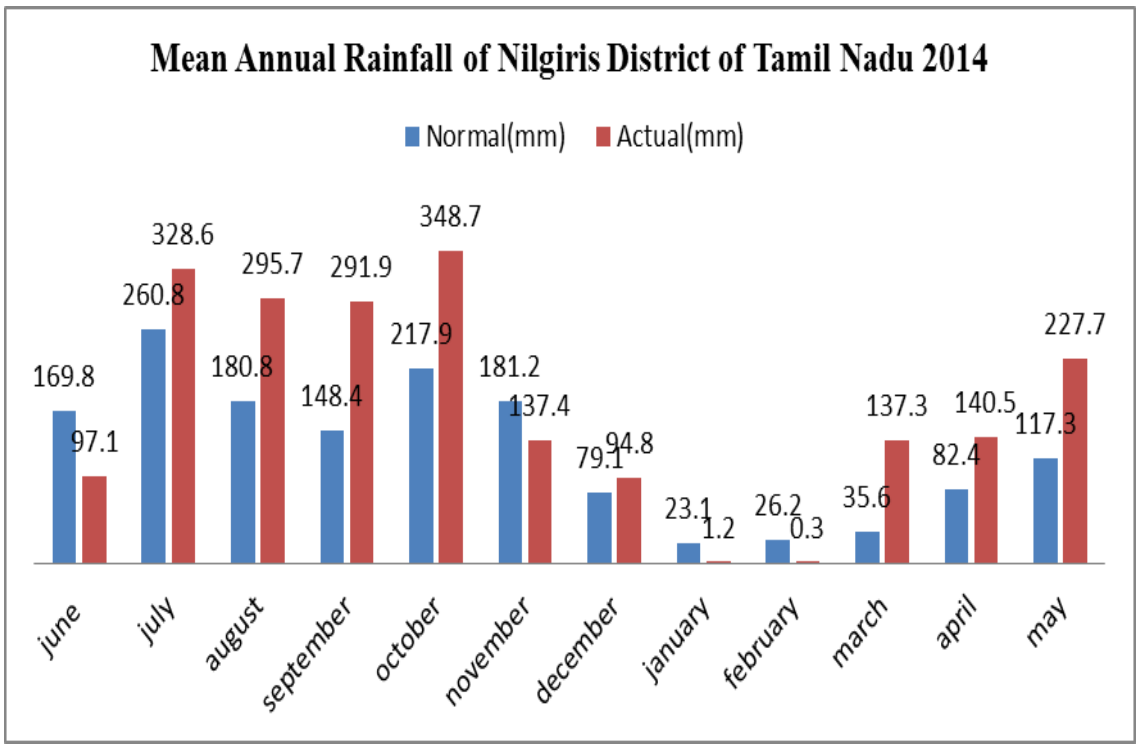

Fig 8 a. Mean Annual Rainfall of Nilgiris District of Tamil Nadu

2.6 Land

2.6.1 Land and its types

The nine fold classification of land use pattern is given in Table below. The total geographical area of the district is 254484.94 hectares of which the net sown area constituted less than one third (29.76 per cent) whereas the forests covered 56.00 per cent of the total area. As per the National Forest Policy – 1988, the area under forest cover should be one third of the total geographical area in order to maintain the ecological balance. The forest area in Nilgiris district is far better than the national goal of achieving the minimum area under forest and the district is in good ecological balance.

2.6.2 Land use pattern

The land use pattern among the different blocks of Nilgiris district is presented in the Table 2.17. Among the different blocks, Udhagamandalam block possesses the maximum area coverage under forest of about 80634 ha, followed by Gudalur (37631 ha) and Kotagiri (20203 ha). The net cultivated area is highest in Gudalur (28300 ha) and next is Udhagamandalam block (21276 ha). The land put to non-agricultural uses is highest in Udhagamandalam block (3640 ha).

Table 2.17 Land Use Pattern in Nilgiris District (Block wise)

Sl. No.	Classification	Udhagai	Coonoor	Kotagiri	Gudalur	Total (ha)
1	Forest	80634.00	4107.08	20203.62	37631.99	142576.69
2	Barren and Uncultivable land	1761.00	562.00	694.72	357.00	3374.72
3	Land put in Non-Agricultural use	3640.00	2764.15	1169.01	2403.00	9976.16
4	Cultivable Waste	973.14	28.13	501.03	216.68	1718.98
5	Permanent pastures and other Grazing Lands	2132.00	923.02	1660.96	362.00	5077.98
6	Miscellaneous trees crops and grows not included in the net area sown	2253.00	600.37	414.08	553.00	3820.45
7	Current fallow lands	5627.31	1014.12	1704.72	792.59	9138.74
8	Other fallow lands	1467.23	38.00	0.00	1555.08	3060.31
9	Net - Cultivated Area	21276.32	12846.56	13317.06	28300.97	75740.91
10	Total Geographical area	**119764.00**	**22883.43**	**39665.20**	**72172.31**	**254484.94**

Source: Commodity Potential Report (2013), Directorate of CARDS, TNAU, Coimbatore-03

Almost 85 percent of the area is under the forest and agricultural activities are predominant in this district. Plantation crops like tea and coffee are the major crops which covered most of the agricultural area. Among the four blocks Coonoor has the highest agricultural activities with 56.14 percent and followed by Gudalur with 39.21 percent, Kotagiri with 33.57 percent and Udhagamandalam with 17.76 percent of net cultivable area, corresponding to its block total geographical area. Udhagamandalam has the least agricultural activities than other blocks. It is noticed that most of the tourist and other commercial activities are in the district headquarters. The share of district area under cultivable waste, current fallow and other fallow accounted for about 5.47 per cent of the total area and this would reveal that implementation of land reclamation, strengthening of irrigation facilities and so on through schemes by various departments increases the net sown area or area under forest.

As indicated in the Table 2.18, about 56.03 per cent of the area is under forest (142577 ha) and 29.76 per cent is net sown area (75741 ha). The Cultivable Waste is very less of about 0.68 per cent.

Table 2.18 Land Use Pattern in the district (2014-15)

Sl.No	Particulars	Area (ha)	Per cent
1	Forest	142577	56.03
2	Barren and Uncultivable uses	3375	1.33
3	Land put to Non-Agricultural uses	9977	3.92
4	Cultivable Waste	1719	0.68
5	Permanent pastures and other Grazing Land	5078	2.00
6	Land Under Miscellaneous Tree Crops and Groves not included in Net Area Sown	3820	1.50
7	Current Fallow	9139	3.59
8	Other Fallow Land	3059	1.20
9	Net Area Sown	75741	29.76
10	Total Geographical Area	254485	100.00
11	Forest	142577	56.03

Source: Season and Crop Report (2014-15)

Table 2.19 Land Use Pattern of Nilgiris District (2014-15) & Compound Growth Rates (2005-06 to 2014-15) per annum

Sl.No	Classification	Area (ha)	Percent	CGR (%)
1	Forest	142577	56.03	-0.02
2	Barren and Uncultivable uses	3375	1.33	0.57
3	Land put to Non-Agricultural uses	9977	3.92	0.50
4	Cultivable Waste	1719	0.68	-3.97
5	Permanent pastures and other Grazing Land	5078	2.00	0.12
6	Land Under Miscellaneous Tree Crops and Groves not included in Net Area Sown	3820	1.50	1.25
7	Current Fallow	9139	3.59	7.18
8	Other Fallow Land	3059	1.20	-8.14
9	Net Area Sown	75741	29.76	-0.28
10	Total Geographical Area	254485	100.00	0.00
11	Area Sown More Than Once	3.0	0.00	35.90
12	Total Cropped Area	75744		-0.29
13	Irrigated Area	364		--

The compound growth rate analysis revealed that the forest area showed a decreasing trend (0.02 %) over the year. The cultivable land is also decreasing at the rate of 3.97 per cent and other fallow land is decreasing at 8.0 per cent over the decade.

2.6.3 Land Holdings Pattern

The number and extent of operational land holdings are given in Table 2.20. As could be seen from table the distribution of land holdings in Nilgiris district is high among the marginal and small farmers category. Big farmers, scheduled castes and scheduled tribes are in small contribution

Table 2.20 Distribution of operational land holdings

Particulars	Udhagai		Coonoor		Kotagiri		Gudalur	
	No.	%	No.	%	No.	%	No.	%
Marginal Farmers	11377	63.26	5294	72.88	8910	80.30	4564	32.43
Small Farmers	5884	38.72	1411	19.42	1775	16.00	8476	60.22
Big Farmers	723	4.03	559	7.69	410	3.70	1035	7.35
Total Farmers	17984	100	7264	100.00	11095	100.00	14075	100.00
S.C.Farmers	3187	17.72	847	11.66	1042	9.39	4588	32.60
S.T. Farmers	783	4.35	178	2.45	608	5.48	1999	14.20
Other Farmers	14014	77.93	6239	85.89	9445	85.13	7488	53.20
Total Farmers	**17984**	**100.00**	**7264**	**100.00**	**11095**	**100.00**	**14075**	**100.00**

Source: Commodity Potential Report (2013), Directorate of CARDS, TNAU, Coimbatore-03

2.7 Sources of Irrigation

The source of irrigation mainly depends on the summer showers, South West and North East monsoons. From the Table 2.21, it is inferred that the gross and net irrigated area is declined by irrigating through canals.

Table 2.21 Area irrigated by different sources of water supply and growth rates

Sl.No	Area irrigated	Net Area Irrigated	Gross Area Irrigated
1	Canals	-24.21	-24.21
2	Tanks	0.00	0.00
3	Tube wells	0.00	0.00
4	Ordinary wells	-4.34	-4.32
5	Other sources	-21.80	-21.80
	Total	**-7.79**	**-7.78**

Source: Season and Crop Report (2014-15)

Table 2.22 Distribution of net area irrigated by sources in percentage (2011)

District	Canals		Tanks		Wells		Others	
	% to the State	% to all Sources in the district	% to the State	% to all Sources in the district	% to the State	% to all Sources in the district	% to the State	% to all Sources in the district
The Nilgiris	0.00	0.00	0.00	0.00	0.00	86.30	0.60	13.70

Source: Season and Crop Report (2014-15)

Gross area irrigated includes the net area irrigated and the area irrigated more than once. Around the district, well irrigation accounts for 86.30 per cent to all sources in the district. Others sources contributes to 13.70 per cent in the district. The irrigation trend is furnished in the Table 2.22.

Table 2.23 Irrigation by different sources in Nilgiris district during 2014-15

Sl.No	Sources	Gross area irrigated (ha)	Net area irrigated (ha)
1	Dug wells/Open wells	422	422
2	Tube wells/Bore wells	0	0
3	Tanks	0	0
4	Canals	0	0
5	Other sources	-	-
	Total	**422**	**422**

Source: Season and Crop Report (2014-15)

From the Table 2.23, it is observed that 100 per cent of irrigation is done through dug wells or open wells and covered an area of about 422.00 ha during 2014-15.

2.8 Cropping pattern

2.8.1 Major crops grown

The following Table 2.24 shows the district wise Cropping intensity during 2011 census in Tamil Nadu.

Table 2.24 District contribution to net area sown in ha (2014-15)

District	Geographical area	Net Area Sown	% of net area sown to		Cropping intensity
			Geographical area	State total	
The Nilgiris	254485	75741	29.76	1.6	1.00

Source: Season and crop report, Govt. of Tamil Nadu 2014-15

Cropping intensity refers to the ratio between the gross area sown and the net area sown. The cropping intensity for the district during 2014-15 is 1.00.

The block wise area under major crops in the Nilgiris district is furnished in the Table 2.25. Plantation crops like Tea and Coffee occupies the major share among the all the crops. It is cultivated in an area of about 64084 ha next to this is the vegetable crops which accounts for an area of 6263 ha. Sub-tropical fruit crops and other non-food crops constitute 1069 ha and 1097 ha respectively. Flowers, medicinal plants, cereals and oil seeds are cultivated in some packets of the district with altogether area coverage of 565 ha.

Among the different blocks, Gudalur block constituted largest cultivated area of about 28300 ha followed by Udhagai block (21276 ha). Coonoor and Kotagiri constituted 12846 and 13317 ha respectively. Plantation crops like tea and coffee are the predominant crop of the different blocks in the district. Vegetable occupies the second place in area.

Table 2.25 Area under crops in different blocks of the Nilgiris district

Sl. No	Name of the Crops	Udhagai	Coonoor	Kotagiri	Gudalur	Total (ha)
1	Vegetables	5385.82	490.07	260.39	127.12	**6263.40**
2	Fruits	1.90	38.64	44.08	985.05	**1069.67**
3	Spices and Condiments	145.86	113.80	31.22	2372.20	**2663.08**
4	Flowers	8.12	33.34	36.39	5.3	**83.15**
5	Medicinal Plants	6.10	1.08	0.80	2.20	**10.18**
6	Plantation Crops	15029.02	12163.68	12915.86	23975.54	**64084.10**
	Field Crops					
7	I) Cereals	0.00	4.30	5.22	394.35	**403.87**
8	II) Oil Seeds	15.40	0.96	0.89	49.16	**66.41**
	III) Sugar Crops	0.00	0.00	0.00	0	**0.00**
	IV) Pulses	0.00	0.00	0.00	0.00	**0.00**
9	Other Non-Food Crops	684.10	0.69	22.21	390.05	**1097.05**
	Total Cultivated Area	**21276.32**	**12846.56**	**13317.06**	**28300.97**	**75740.91**

Source: Commodity potential Report (2013), Directorate of CARDS, TNAU, Coimbatore -03

The area under major food crops in the district is presented in the Table 2.26. Among the food crops, Paddy is the predominant crop cultivated in an area of 499 ha next to this is the pulse crops; Ragi is cultivated in 4 ha. The majority of the crops are cultivated under rain fed (471 ha) and the area under irrigated condition is found to be less (32 ha).

Fig.9 Major Crops grown in the Nilgiris district

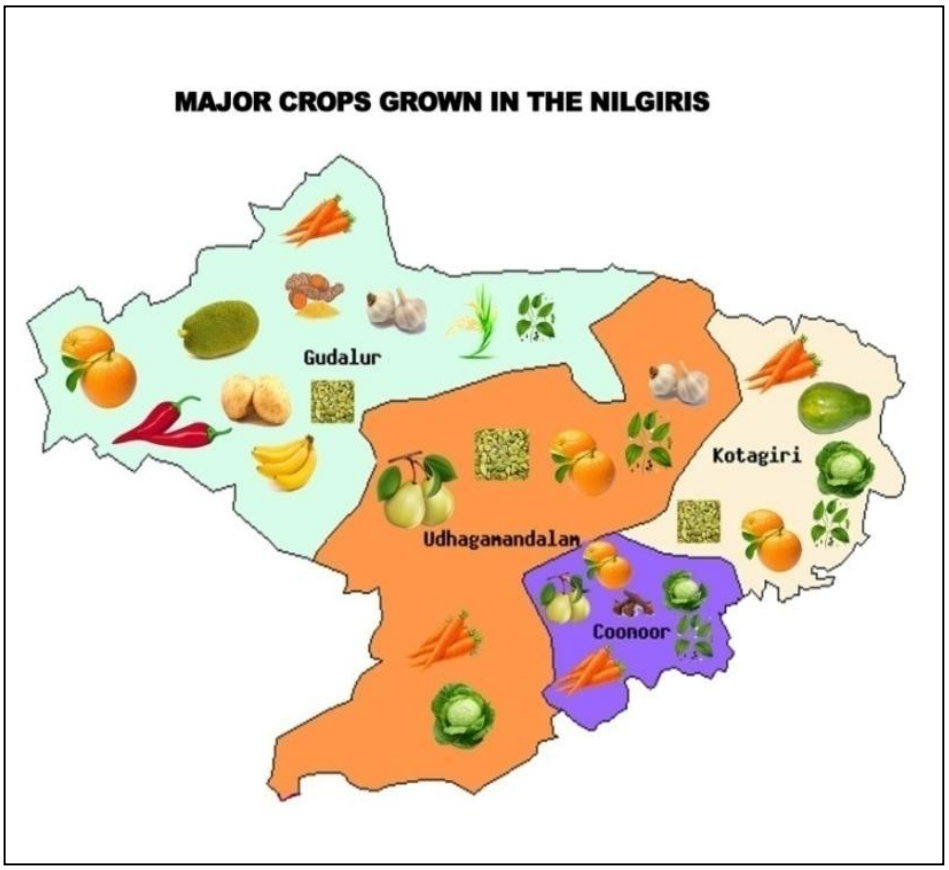

Table 2.26 Area under major food crops in ha (2014-15)

Crop	Kar /Kuruvai / Sornavari (Apr-July)			Samba / Thaladi / Pishanam (Aug-Nov)			Navarai /Kodai (Dec-March)			(Total)		
	irrigated	Unirrigated	Total	irrigated	Unirrigated	Total	irrigated	Unirrigated	Total	irrigated	Unirrigated	Total
Paddy	32	467	499	0	0	0	0	0	0	32	467	499
Wheat	0	0	0	0	0	0	0	0	0	0	0	0
Cholam	0	0	0	0	0	0	0	0	0	0	0	0
Cumbu	0	0		0	0	0	0	0	0	0	0	0
Ragi	0	4	4	0	0	0	0	0	0	0	4	4
Maize	0	0	0	0	0	0	0	0	0	0	0	
Panivaragu	0	0	0	0	0	0	0	0	0	0	0	0
Green gram	0	0	0	0	0	0	0	0	0	0	0	0
Total										**32**	**471**	**503**

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

Table 2.27 Area under major horticultural crops in ha (2014-15)

Crop	Irrigated (in ha)	Unirrigated (in ha)	Total (in ha)
A. Spice and Plantation crops			
Arecanut	0	332	332
Cardamom	0	251	251
Chillies	0	23	23
Garlic	22	43	65
Ginger	0	828	828
Pepper	0	1358	1358
Nutmeg	0	18	18
Cloves & Cinnamon	0	13	13
Turmeric	0	7	7
Total	**22**	**2873**	**2895**
B. Fruit crops			
Banana	0	1064	1064
Mango	0	22	22
Jack fruit	0	97	97
Guava	0	42	42
Pomegranate	0	1	1
Apple	0	2	2
Plums	0	2	2
Pear	0	8	8
Mangosteen	0	1	1
Strawberry	0	5	5
Kamala orange	0	1	1
Orange	0	50	50
Lemon	0	9	9
Amla			
Total	**0**		**1245**

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

The area under major horticultural crops is given in the Table 2.27. The spice and fruit crops constitute an area of 1245 ha in the district. Among the spice, pepper is the predominant crop cultivated in 1358 ha under rain fed conditions. Ginger is the rhizomatous crops grown in 828 ha area. Among the fruits, banana is grown in largest area of about 1064 ha and next to which is the jack (97 ha), orange (50 ha) and guava (42 ha) cultivated in few area.

The triennium ending average area for the major crops (2014-15) is furnished in the Table 2.27 a. Tea is the predominant crop which occupies 77 per cent of the area with coverage of 56071 ha and next to which is the coffee which accounts for 10 per cent of area. Among the vegetables, carrot occupies 3.0 per cent of the cropping area and other crops account for nearly 17.00 per cent of the total cultivated area.

Table 2.27 a. Area under major crops in ha (2014-15 and Triennium ending 2014-15)

Sl. No	Crops	2014-15	%	Triennium ending 2014-15	%
1	Paddy	399	0.55	433	0.60
2	Banana	883	1.22	958	1.32
3	Potato	1786	2.47	1406	1.94
4	Tapioca	55	0.08	69	0.10
5	Carrot	2433	3.36	2432	3.35
6	Beet root	163	0.23	365	0.50
7	Cabbage	640	0.88	1048	1.44
8	Ginger	407	0.56	595	0.82
9	Cardamom	1036	1.43	773	1.06
10	Pepper	960	1.33	1192	1.64
11	Tea	56320	77.82	56071	77.20
12	Coffee	7291	10.07	7288	10.03
	Total	**72373**	**100.00**	**72631**	**100.00**

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

Table 2.27 b. Area, production and productivity of vegetable crops (2014-15)

Sl.NO	Crop	Udhagai			Coonoor			Kotagiri			Gudalur			Total		
		A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Potato	1409.8	30310.70	21.5	101.79	2117.23	20.8	35.32	732.89	20.75	0.30	6.03	20.10	1547.21	32166.50	20.79
2	Cabbage	333.14	21071.11	63.25	19.31	1177.91	61.0	89.45	6082.60	68.0	0.00	0.00	0.00	441.90	28316.95	64.08
3	Carrot	2209.88	70716.16	32.0	353.64	9901.92	28.0	93.01	2604.28	28.0	0.00	0.00	0.00	2656.53	77916.02	29.33
4	Beans	582.39	4804.72	8.25	32.29	258.32	8.00	58.75	478.81	8.15	13.50	108.00	8.00	686.93	5564.13	8.10
5	Beetroot	398.20	9556.80	24.0	6.06	127.26	21.0	9.10	204.75	22.5	0.00	0.00	0.00	413.36	9300.60	22.50
6	Radish	163.85	3794.77	23.16	1.10	22.00	20.0	0.00	0.00	0.00	0.00	0.00	0.00	164.95	3559.62	21.58
7	Cauliflower	66.00	1650.00	25.0	4.50	111.15	24.7	0.40	8.80	22.00	0.00	0.00	0.00	70.90	1694.51	23.90
8	Turnip	417.10	9593.30	23.0	6.19	145.47	23.50	0.92	18.40	20.00	0.00	0.00	0.00	424.21	9404.74	22.17
9	Peas	29.60	276.76	9.35	1.49	14.01	9.40	1.00	9.00	9.00	0.00	0.00	0.00	32.09	296.83	9.25
10	Knol-khol	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	Tapioca	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	57.36	1950.24	34.00	57.36	1950.24	34.00
12	Yam	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	16.33	506.23	31.00	16.33	506.23	31.00
13	Sweet Potato	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	Chow chow	10.00	230.00	23.0	16.69	417.25	25.0	3.33	69.93	21.00	0.00	0.00	0.00	30.02	690.46	23.00
15	Brinjal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	12.50	12.50	1.00	12.50	12.50
16	Greens	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	Bittergourd	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.00	150.00	10.00	15.00	150.00	10.00
18	Colacasia	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.35	12.49	9.25	1.35	12.49	9.25
19	Other Vegetables	36.00	432.00	12.00	0.00	0.00	0.00	0.80	8.00	10.00	3.70	45.14	12.20	40.50	461.70	11.40
	Total	**5655.96**	**152436.31**	**24.05**	**543.06**	**14292.51**	**24.14**	**292.08**	**10217.46**	**22.94**	**108.54**	**137.05**	**17.13**	**6599.64**	**172003.52**	**22.05**

A- Area, P-Production and Y-Yield

Source: O/o of the Joint Director of Horticulture, The Nilgiris

Table 2.27 c. Area, production and productivity of fruit crops (2014-15)

Sl.No.	Crop	Udhagai			Coonoor			Kotagiri			Gudalur			Total		
		A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Banana	1.30	32.50	25.00	1.00	24.00	24.00	2.64	81.84	31.00	617.06	21597.10	35.00	622.00	21735.44	28.75
2	Orange	0.00	0.00	0.00	6.80	12.24	1.80	43.04	79.62	1.85	14.07	25.33	1.80	63.91	117.19	1.82
3	Jack	0.00	0.00	0.00	2.85	44.60	15.65	33.29	506.01	15.20	71.57	1288.26	18.00	107.71	1838.87	16.28
4	Guava	0.40	2.20	5.50	0.10	0.50	5.00	26.62	135.76	5.10	9.63	57.78	6.00	36.75	196.24	5.40
5	Mango	0.80	3.20	4.00	0.07	0.28	4.00	0.20	0.80	4.00	21.88	102.84	4.70	22.95	107.12	4.17
6	Strawberry	0.48	4.32	9.00	10.21	93.93	9.20	0.00	0.00	0.00	0.00	0.00	0.00	10.69	98.25	9.10
7	Lemon	0.00	0.00	0.00	0.25	0.78	3.10	1.98	5.94	3.00	1.60	4.80	3.00	3.83	11.52	3.30
8	Plum	0.00	0.00	0.00	1.66	13.28	8.00	0.00	0.00	0.00	0.00	0.00	0.00	1.66	13.28	8.00
9	Pear	0.00	0.00	0.00	2.76	33.12	12.00	2.61	31.32	12.00	0.00	0.00	0.00	5.37	64.44	12.00
10	Peach	0.00	0.00	0.00	0.03	0.18	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.18	6.00
11	Apple	0.00	0.00	0.00	1.60	9.60	6.00	0.00	0.00	0.00	0.00	0.00	0.00	1.60	9.60	6.00
12	Mangosteen	0.00	0.00	0.00	0.80	2.80	3.50	0.00	0.00	0.00	0.00	0.00	0.00	0.80	2.80	3.50
13	Durian	0.00	0.00	0.00	0.40	1.08	2.70	0.00	0.00	0.00	0.00	0.00	0.00	0.40	1.08	2.70
14	Custard apple	0.00	0.00	0.00	0.20	2.40	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	2.40	12.00
15	Papaya	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	Other fruits	0.00		0.00	1.37	15.34	11.20	0.60	6.00	10.00	0.63	6.30	10.00	2.60	27.64	10.40
	Total	**2.98**	**42.22**	**10.87**	**30.10**	**254.13**	**8.28**	**110.98**	**847.29**	**10.26**	**736.44**	**23082.40**	**11.21**	**880.50**	**24226.05**	**8.63**

Source: O/o of the Joint Director of Horticulture, The Nilgiris

Table 2.27 d. Area, production and productivity of Spices and Condiments (2014-15)

Sl.No	Crop	Udhagai			Coonoor			Kotagiri			Gudalur			Total		
		A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Pepper	0.00	0.00	0.00	12.97	2.46	0.19	9.77	1.95	0.20	1046.00	219.66	0.21	1068.74	224.08	0.20
2	Cardamom	0.00	0.00	0.00	1.43	0.13	0.09	7.41	0.67	0.09	970.42	97.04	0.10	979.26	97.84	0.09
3	Ginger	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	282.75	4241.25	15.00	282.75	4241.25	15.00
4	Garlic	119.00	833.00	7.00	47.35	321.98	6.80	22.40	156.80	7.00	0.00	0.00	0.00	188.75	1311.78	6.93
5	Nut-meg	0.00	0.00	0.00	20.20	20.20	1.00	0.10	0.10	1.00	0.00	0.00	0.00	20.30	20.30	1.00
6	Vanilla	0.00	0.00	0.00	0.81	0.97	1.20	0.00	0.00	0.00	52.00	78.00	1.50	52.81	78.97	1.35
7	Cloves	0.00	0.00	0.00	12.90	11.61	0.90	0.18	0.16	0.90	0.80	0.72	0.90	13.88	12.49	0.90
8	Chillies	21.00	13.65	0.65	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.65	0.65	22.00	14.30	0.65
9	Turmeric	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.33	91.98	6.00	15.33	91.98	6.00
	Total	**140.00**	**846.65**	**7.65**	**95.66**	**357.36**	**10.18**	**39.86**	**159.68**	**9.19**	**2368.30**	**4729.30**	**24.36**	**2643.82**	**6092.99**	**3.57**

Source: O/o of the Joint Director of Horticulture, The Nilgiris

Table 2.27 e. Area, production and productivity of Flowers (2014-15)

Sl.No.	Crop	Udhagai			Coonoor			Kotagiri			Gudalur			Total		
		A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Rose	11.00	165.00	15.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.00	165.00	15.00
2	Carnation	23.00	287.50	12.50	23.70	284.40	12.00	12.01	144.12	12.00	0.00	0.00	0.00	58.71	716.02	12.17
3	BOP	0.00	0.00	0.00	13.40	24.12	1.80	11.76	19.99	1.70	0.00	0.00	0.00	25.16	44.11	1.75
4	Anthurium	0.00	0.00	0.00	4.05	51.44	12.70	0.00	0.00	0.00	1.40	17.85	12.75	5.45	69.29	12.72
5	Gerbera	8.81	202.63	23.00	0.00	0.00	0.00	0.10	2.10	21.00	0.00	0.00	0.00	8.91	204.73	22.00
6	Lillium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	Other Flowers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**42.81**	**655.13**	**16.83**	**41.15**	**359.96**	**8.83**	**23.87**	**166.21**	**11.57**	**1.40**	**17.85**	**12.75**	**109.23**	**1199.15**	**12.73**

Table 2.27 f. Area, production and productivity of Medicinal Plants (2014-15)

Sl.No.	Crop	Udhagai			Coonoor			Kotagiri			Gudalur			Total		
		A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Lemon grass	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	Geranium	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	Rosemary	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	2.40	12.00	0.20	2.40	12.00
4	Thyme	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Citiodora	0.00	0.00	0.00	1.10	27.50	25.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	27.50	25.00
6	Others	2.00	24.00	12.00	0.00	0.00	0.00	0.00	0.00	0.00	1.09	10.90	10.00	3.09	34.90	12.00
	Total	**2.00**	**24.00**	**12.00**	**1.10**	**27.50**	**25.00**	**0.00**	**0.00**	**0.00**	**1.29**	**13.30**	**11.00**	**4.39**	**64.80**	**16.33**

Table 2.27 g. Area, production and productivity of Plantation Crops (2014-15)

Sl. No.	CROP	Udhagai			Coonoor			Kotagiri			Gudalur			Total		
		A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Tea	14477.20	138981.12	9.60	11644.15	113530.46	9.75	11907.14	115499.26	9.70	17392.13	169051.50	9.72	55420.62	537062.34	9.69
2	Coffee	613.30	398.65	0.65	499.06	359.32	0.72	836.95	585.87	0.70	5906.48	4252.67	0.72	7855.79	5596.50	0.70
3	Rubber	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	67.59	40.55	0.60	67.59	40.55	0.60
4	Cocoa	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.00	12.00	1.00	12.00	12.00	1.00
5	Arecanut	0.00	0.00	0.00	1.72	10.32	6.00	1.21	7.26	6.00	307.34	2182.11	7.10	310.27	2199.69	19.10
6	Cashew	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	**15090.50**	**139379.77**	**5.12**	**12144.93**	**113900.11**	**5.49**	**12745.30**	**116092.38**	**5.47**	**23685.54**	**175538.84**	**3.83**	**63666.27**	**544911.09**	**6.22**

Table 2.27 h. Area, production and productivity of Food Crops (2014-15)

Sl.No.	CROP	Udhagai			Coonoor			Kotagiri			Gudalur			Total		
		A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Paddy	0.00	0.00	0.00	0.00	0.00	0.00	9.00	33.30	3.70	318.60	1146.96	3.60	327.60	1180.26	3.65
2	Wheat	0.00	0.00	0.00	6.00	36.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	36.00	6.00
3	Samai	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	Tenai	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	Ragi	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	Cholam	0.00	0.00	0.00	6.00	16.20	2.70	0.00	0.00	0.00	0.00	0.00	0.00	6.00	16.20	2.70
	Total	**0.00**	**0.00**	**0.00**	**12.00**	**52.20**	**4.35**	**9.00**	**33.30**	**3.70**	**318.60**	**1146.96**	**3.60**	**339.60**	**1232.46**	**4.12**

Table 2.27 i. Area, production and productivity of Oil seeds (2014-15)

Sl.No.	Crop	Udhagai			Coonoor			Kotagiri			Gudalur			Total		
		A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Groundnut	0.00	0.00	0.00	0.00	0.00	0.00	3.78	4.91	1.30	0.00	0.00	0.00	3.78	4.91	1.30
2	Coconut	15.40	107.80	7.00	0.61	4.27	7.00	0.50	3.75	7.50	38.41	288.08	7.50	54.92	403.90	7.25
3	Mustard	0.10	0.03	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.03	0.30
	Total	**15.50**	**107.83**	**3.65**	**0.61**	**4.27**	**7.00**	**4.28**	**8.66**	**4.40**	**38.41**	**288.08**	**7.50**	**58.80**	**408.84**	**8.85**

Table 2.27 j. Area, production and productivity of Sugar crops (2014-15)

Sl.No.	Crop	Udhagai			Coonoor			Kotagiri			Gudalur			Total		
		A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Sugarcane	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	330.00	110.00	3.00	330.00	110.00
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**3.00**	**330.00**	**110.00**	**3.00**	**330.00**	**110.00**

Table 2.27 k. Area, production and productivity of Pulses (2014-15)

Sl.No.	Crop	Udhagai			Coonoor			Kotagiri			Gudalur			Total		
		A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	Green gram	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.70	0.70	1.00	0.70	0.70
	Total	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**1.00**	**0.70**	**0.70**	**1.00**	**0.70**	**0.70**

Table 2.27 l. Area, production and productivity of Other Non -Food Crops (2014-15)

Sl.NO	Crop	Udhagai			Coonoor			Kotagiri			Gudalur			Total		
		A	P	Y	A	P	Y	A	P	Y	A	P	Y	A	P	Y
1	**Other Non - Food Crops**	240.91			0.10			147.48			233.81			622.30		

Note: Flowers Lakhs in stems Medicinal & Aromatic plants Herbage T/Ha

Source: G.Return report 2013-2014

2.9 Distribution of Chemical Fertilizers

If suitable biodynamic organic farming systems are developed for the Nilgiris District, it is a great boon to the farmers since the system reduces the use of pesticide and chemical fertilizers to the soil ecosystem which in turn reduces the cost of cultivation.

Due to non-availability of cattle manure, the farmers have to do indiscriminate application of chemical fertilizers, pesticides and weedicides leading to the soil becoming unproductive in many areas.

Table 2.28 Distribution of nitrogen, phosphorous and potash in the district

(Lakh tonnes)

	2011-12	2012-13	2013-14
Nitrogen	0.04	0.03	0.04
Phosphorous	0.02	0.01	0.01
Potash	0.03	0.02	0.04

Source: Department of Agriculture, Chennai -05

2.10 Agricultural Engineering - Machineries and Implements

The number of agricultural implements and machineries in Nilgiris district are given in Table 2.29 given below.

Table 2.29 Agricultural Implements and machinery in the district

Sl. No	Items	In Numbers	
1	**Ploughs**		
	a) Wooden	4	5
	b) Iron	2	2
	Total	**6**	**7**
2	**Water pumps for Irrigation Purpose**		
	a) Worked by Oil Engine	1806	1876
	b) Worked by Electric Power	368	398
	Total	**2174**	**2274**
3	**Tractors**		
	a) Government	11	12
	b) Private	41	45
	Total	**52**	**57**
4	**Sugarcane Crushers**		
	a) Worked by Power	Nil	Nil
	b) Worked by Bullocks	Nil	Nil
	Total	**Nil**	**Nil**
5	**Oil Ghanis**		
	a) 5Kg and above	Nil	Nil
	b) Less than 5 Kg.	Nil	Nil
	Total	**Nil**	**Nil**

2.11 Agricultural Marketing and Regulated Markets

As of now there is no regulated markets in the Nilgiris district and four number of farmers markets are located at Ooty with 35 tonnes / day capacity Coonoor with 20 tonnes/day capacity Gudalur with 6 tonnes/ day capacity and Kotagiri with three tonnes/day capacity. There is only one cooperative society in this district called NCMS-Ooty (Nilgiris Co-op Marketing Society), through which vegetables are marketed outside the district. Apart from that there is another cooperative society which is being operated in Mettupalayam (NCMS-Mettupalayam.) for the benefit of Nilgiris vegetable growers.

Marketing Infrastructure

The Marketing facilities available in the district for agricultural commodities are listed out in the Table 2.30

Table 2.30 Marketing Infrastructures

Sl.No.	Particulars	No. units	Department / Agency
1	Drying yard	40	Department of Agricultural Engineering
2	Storage godown	27	-
3	Cold storage for Floriculture	2	Department of Horticulture
4	Uzhavar sandhai	4	Department of Agricultural marketing & Agri Business
5	Regulated markets	Nil	-
6	Carrot washing machines	25	Private establishments
7	Marketing complex	1	Department of Agricultural marketing & Agri Business
8	Agro based and Agri-based processing industries	25	Department of Agriculture
9	Small scale	2	Department of Agriculture
10	Medium scale	134	
11	Large scale	28	
12	Number of weekly markets / shandies	5	Department of Agriculture & Horticulture
13	Number of permanent markets and Central Markets	5	Department of Agriculture & Horticulture
14	Number of Co-operative Marketing society	2	Department of Agricultural marketing & Processing

Source: Commodity Potential Report (2013), Directorate of CARDS, TNAU, Coimbatore -03

Marketing infrastructure-present status

- Four numbers of Farmers market located at Ooty (~35 tons/day), Coonoor (~20 tons/day), Gudalur (~6 tons/day) and Kotagiri (~3tons/day).
- Marketing through NCMS-Ooty (Nilgiris Co-op Marketing Society) and NCMS-Mettupalayam.
- There are 25 nos. of carrot washing units (private) available and one number of fruit processing unit.
- 166 Tea processing factories (23 – Govt. and 143-private), 24 Nos. of Coffee grinding units and one number of pepper processing units are functioning.

2.12 Storage Facilities

Cold storage is an essential aspect of floriculture and it is rather impossible to compete in the world floriculture market without having cold chain facilities. Planting materials especially bulbs require cold storage for the resting period and the cut flowers require cold storage for keeping them fresh for certain period. It is not economical to have a cold storage for smaller farms. At present, the florists of Nilgiris have to be depending on the commercial cold storage facilities at Mettupalayam, which is not logistically well located. The cold storage facilities have to be encouraged either by co-operative societies like Nilgiris Co-operative marketing societies or by the private agencies in Nilgiris.

Moreover the fruits produced in Nilgiris are comparatively hard and crisp with good shelf-life up to 4 days in normal storage conditions and 5 to 6 days in home refrigerator.

- Storage godown for vegetables and spices especially for ginger and pepper
- Cold storages for vegetables, fruits and mushrooms.

Commercial refrigerated truck services

Government can encourage either government or private organization to operate refrigerated, commercial goods vehicles for perishables from Ooty to Bangalore. There is enough potential for the load for the return journey from Bangalore to Ooty. Plenty of apples, oranges, floriculture planting materials, seeds, ornamental rose plants and vegetables are being transported from Bangalore to Ooty regularly.

2.13 Sericulture

Sericulture is also under operation as an additional occupation in agriculture. Kotagiri block is more concentrated with the production of cocoons 13134 kg followed by Gudalur with 2147 kg and Coonoor with 1644 kg.

Table 2.31 Sericulture development in the district

Sl. No	Name of the Block	Area under Mulberry (in acres)	Production of cocoons (in kg)	Value (in Rs.)
1	Udhagamandalam	0.00	0.00	0.00
	Kssdi	2.05	30	3000
2	Coonoor	23.00	1644	193072
3	Kotagiri	62.00	13134	1386283
4	Gudalur	26.85	2147	265934
	Total	**113.9**	**16955**	**1848289**

Source: Commodity Potential Report (2013), Directorate of CARDS, TNAU, Coimbatore

2.14 Animal Husbandry and Dairy Development

Animal Husbandry Department provides timely and effective health coverage to the livestock and poultry population of the State for augmenting their production and productivity. Veterinary services are provided through the wide network of Veterinary Institutions and sub-centres located in all the districts. The services provided include health cover, disease diagnosis, disease prevention, and disease control, breeding support and imparting training to farmers. While Veterinary services are provided by the professional work force, minor veterinary services and first aid are provided through Para veterinarians.

2.14.1 Livestock population, Poultry and Fisheries

The sholas were used for grazing cattle. The livestock population inside the Nilgiris Biosphere Reserve is very low but the population in the periphery is very high. The livestock's include cattle (50768 No's), buffaloes (4271 No's), goats (37393 No's) and sheep (4643 No's). The poultry populations in the district are about 120560numbers of which 94515 are from backyard poultry and 26045 from farm poultry. The details are furnished in the Table 2.32.

Table 2.32 Livestock population in the district (2014-15)

Sl.No.	Particulars	Population
1	Cattle	50768
2	Buffaloes	4271
3	Sheep	4643
4	Goats	37393
5	Horses and ponies	108
6	Donkeys	216
7	Camels	0
8	Pigs	393
	Total Livestock	**97792**
9	Elephants	0
10	Dogs	14765
11	Rabbits	2051
	Poultry	
12	Back yard Poultry	94515
13	Farm Poultry	26045
	Total Poultry	**120560**

Source: 12th Livestock Census, 2012

Table 2.33 Breedable population in the district

Sl. No	Breed able population	Population (in Numbers)	Total population
1	**Cattle**		
a	Exotic and cross breeds	13738	17020
b	Indigenous	3282	
2	**Buffaloes**		
a	Murrah	56	535
b	Other graded	0	
c	Toda	251	
d	Non description	228	
	Total population		**17555**

Source: Census Report (2011-12)

The total breed able population in the district is about 17020 numbers of which 13738 numbers are exotic and cross breeds. The total buffalo's breeds are about 535 numbers. The details on breedable population are given in the Table 2.33.

The block wise livestock population in the district is furnished in the Table 2.34. Among the different blocks, Gudalur registered the highest livestock population (88383.0 No's). Of which cattle constitute 14023 numbers, buffalo (12 No's), sheep (676 No's), Goat (15345 No's) and Poultry (58276 No's). This is followed by Udhagamandalam block which constitutes population of 34935 No's and Coonoor block (22288 No's) respectively.

Table 2.34 Livestock population in the district (2013-14)

Livestock population	B1	B2	B3	B4
Cattle	15926	4043	14023	5270
Buffalo	1678	112	12	350
Sheep	2396	0	676	595
Goat	2439	6926	15345	3075
Pigs	0	2	0	0
Poultry	12373	11205	58276	8639
Others	123	0	51	0
Total	**34935.00**	**22288.00**	**88383.00**	**17929.00**

B1- Udhagamandalam, B2 - Coonoor; B3 - Gudalur; B4 – Kotagiri
Source: TANUVAS, Chennai

2.14.2 Veterinary institutions and hospitals

With the goal of sustaining and further improving the production of livestock products, the Animal Husbandry Department provides comprehensive veterinary assistance and health cover to all livestock and poultry across the district through a network of 26 Veterinary Institutions and 13 Veterinary Sub- Centres.

Veterinary Polyclinics function round the clock, providing specialized services in gynecology, surgery and medicine. They are headed by Clinician in the rank of Assistant Director, who is assisted by Veterinary Assistant Surgeons. Veterinary Clinical Centres are headed by Clinician who is assisted by Veterinary Assistant Surgeons.Veterinary Hospitals are headed by Veterinary Surgeons and assisted by either Veterinary Assistant Surgeons or Senior Veterinary Livestock Supervisors or both. Inpatient facilities are also available in these Centres.

The Veterinary Dispensary which is the basic structural and functional unit of the Department is manned by Veterinary Assistant Surgeons. Treatment to ailing animals, Artificial Insemination, treatment of infertility cases, Preventive Vaccination for diseases, Deworming, Castration, extension services and training to farmers are the activities carried out in these Veterinary Institutions.

Mobile Veterinary Units function in the Department with the aim of providing doorstep delivery of veterinary health services to livestock reared in remote areas. At present, three Mobile Veterinary Units are functioning in the district.

Sub-Centres, manned by Livestock Inspectors, provide first-aid to ailing animals besides, performing minor veterinary services artificial insemination, pregnancy verification, vaccination, deworming etc., under the guidance of the Veterinary Assistant Surgeons. At present, 13 Sub-Centres are functioning in the district. With the implementation of cross breeding programme and various other schemes by the

department, livestock farming has become economically viable and remunerative to a large number of rural households in the State.

Table 2.35 Veterinary and hospitals in the district (2012-13)

Sl. No	Veterinary Institutions	Numbers
1	Divisions	2
2	Union Panchayats	4
3	Polyclinics	-
4	Clinical centres	1
5	Hospitals	2
6	dispensaries	19
7	Rural Veterinary dispensaries	4
8	Mobile units	3
9	Sub centres	13
10	Visiting sub centres	2
11	Livestock Farms	1
12	Frozen Semen Production Stations	1
13	CBFD	1

Source: Statistical Handbook (2013), Department of Animal Husbandry and Veterinary Services, Chennai – 600 006

2.14.3 Dairy development

Dairy sector is important not only as the producer of highly nutritious food products, but also for the sustenance of poor farmers and over all prosperity of the farming community. The Animal Husbandry Sector provides necessary back-up support for the Dairy Development activities in Nilgiris District. Solutions to improve the economic status of the milk producers are being arrived at, by the Government *viz.,* timely payment to the producers, remunerative price, subsidy schemes and inputs like breeding facilities, cattle feed etc., From the Table 2.36, for the recent development of dairy sector, there were 105 societies and the members of the societies are about 4821 who were pouring through different centres. The milk collected are processed and stored in a chilling centre located in the district with a capacity of 50000 liters per day.

Table 2.36 Union wise Societies, members and handling capacity

Name of the union	No. of Societies	No. of pouring members	Year of commencement	No. of Chilling centres	Licensed capacity including Dairy (in LPD)
The Nilgiris	105	4821	1982	1	50000

Source: Dairy development, Policy Note (2013-14)

Table 2.37 Product production in the district unions

Name of the union	SMP (in MT)	Butter (inMT)	Ghee (inMT)	Khova (in kg)	Ice cream (inLitres)
The Nilgiris	--	--	46	6418	2100

Source: Dairy development, Policy Note (2013-14)

The products developed through the dairy were about 46 MT of Ghee, 6418 kg of khova and 2100 litres of ice creams in the district. The details are furnished in the Table 2.37.

Table 2.38 Milk production in the districts (2011)

Name of the union	Milk ('000 Tonnes)	
	2011-12	2012-13
The Nilgiris	89.60	48.90

Source: Director of Animal Husbandry and Veterinary Services, Chennai-6

The total includes cow's milk and buffaloes. During 2011-12, about 89600 tonnes of milk were produced while in 2012-13 it was reduced to 48900 tonnes. The addition of the each breed constitutes the total milk production in the district and it is presented in the Table 2.38.

2.14.4 Egg production

Poultry sector plays a pivotal role among the sub-sectors in potentiating the role of animal husbandry in the process of rural economic development of the district. Poultry egg and meat are important sources of high quality proteins, minerals and vitamins to balance the human diet. The poultry keeping has evinced great interest among poultry farmers. There is a good potential for export of eggs, egg products and frozen chicken meat from our State to Gulf countries, Russia etc. Further, due to the changes in consumption behavior of the people in the state towards desi chicken and desi eggs, there is great scope for the development of backyard poultry. The egg production in the district is furnished in the Table 2.39. There are about 17.90 lakhs eggs were produced during 2011-12 and 18.90 lakhs during 2012-13. The major share was from the desi breeds.

Table 2.39 Egg production in the district (2011)

Name of the union	Egg (Lakhs)	
	2011-12	2012-13
The Nilgiris	17.90 Desi – 17.922 lakh no's Improved – 0.0 lakhs no's	18.30

Source: Director of Animal Husbandry and Veterinary Services, Chennai-6

2.15 Fisheries

The present geographical distribution of fish species in the Western Ghats along these ranges suggests the likely migratory routes of cold water fish.102 species belonging to 39 genera and 14 families are known from the uplands of the Western Ghats. Most of them are of small size and are captured by subsistence fisher folk. Various species of cyprinids of the genera Labeo, Cirrhinus, Puntius and Tor contribute to commercial catches in the rivers and their principal tributaries, lakes and reservoirs. Tor is an important sport fish, especially in the Cauvery. The exotic fish in the Western Ghats are *Cyprinuscarpio, Carassius carassius, Tincatinca, tilapia Oreochromis mossambicus* and the rainbow trout *Oncorhynchus mykiss* (golden and ordinary strains).

The inland fish production in the district is furnished in the Table 2.40. The district accounts for about 13.65 tonnes of inland fish during 2011-12.

Table 2.40 Fish production in the district (2011)

Name of the union	Inland (Tonnes)		Marine (Tonnes)		
	2011-12	2012-13	2011-12	2012-13	2013-14
The Nilgiris	13.65	--	--	--	--

Source: Director of Animal Husbandry and Veterinary Services, Chennai-6

2.16 Banking and Insurance

The Nilgiris has a good Banking Infrastructure and this has contributed to the Economic development of the district. In this district also, branches have been opened in all the identified un-banked centers. Government and Private Banks are present in the district for the welfare of native people. The banks like State Bank of India, State Bank of Travancore, Andhra bank, Canara bank etc., and private banks include South Indian bank, Catholic Syrian bank, Karur Vysya Bank, UTI bank etc. The details of bank deposits, CDR ratio and sector wise credit details are furnished in the Table 2.41.

Table 2.41 Banking sectors in the district (2014-15)

Sl. No	Banks	Deposits (in lakhs)	Advance (in lakhs)	Credit Deposit Ratio (%)	Sector wise credit details
	1. Government Banks				
1	State bank of India	71528	38818	55	0
2	State Bank of Travancore	6641	2304	65	0
3	Andhra Bank	2393	342	49	0
4	Bank of Baroda	1806	1163	29	0
5	Bank of India	7138	1837	121	0
6	Canara Bank	83467	27818	98	0
7	Central Bank of India	20951	6151	131	0

Sl. No	Banks	Deposits (in lakhs)	Advance (in lakhs)	Credit Deposit Ratio (%)	Sector wise credit details
8	Corporation Bank	4418	480	75	0
9	Indian Bank	41672	8695	52	0
10	Indian Overseas Bank	7492	3730	95	0
11	Syndicate Bank	48000	15100	95	0
12	Union Bank of India	14781	5912	160	0
13	UCO Bank	17578	4154	154	0
14	United Bank of India	1458	490	388	0
15	Vijaya Bank	18561	1972	72	0
16	Oriental Bank of Commerce	2006	250	51	0
17	Punjab National Bank	5446	1018	98	0
	2. Private Bank				
18	Catholic Syrian Bank Ltd	5181	540	22	0
19	KarurVysya Bank Ltd	2428	1540	61	0
20	South Indian Bank Ltd	7724	4516	59	0
21	TAICO Bank Ltd	2229	2299	207	0
22	NDCC Bank Ltd	40750	75645	164	0
23	TNSARD Bank Ltd	0	0	0	0
24	UTI	8582	227	22	0
25	Karnataka Bank	2049	501	323	0
26	ICICI	1958	1274	84	0
27	Indus Ind Bank	2124	106	38	0

Source: The Lead District Manager, Canara Bank, Ooty

With a view to insulate the farmers against the loss occurred due to natural calamities, large scale outbreak of pests and diseases and to ensure credit worthiness for the ensuing season, the Agricultural Insurance Company of India Limited implements the National Agricultural Insurance Scheme in the State. The unit of insurance under the scheme is block depending on the area under the crop notified. Timely availability of credit at reasonable rates especially to small and marginal farmers is crucial for agricultural growth. Public sector banks, co-operative banks and regional rural banks play an important role in meeting the entire crop loans needs in the State. The total number of policies issued, sum assured, number of beneficiaries etc., are furnished in the Table 2.42.

Table 2.42 Insurance schemes in the district (2014-15)

Sl. No.	Name of the Insurance	No. of branches	Policies issued	Sumassured (in cr)	No. of beneficiaries	Amount paid as compensation (in cr)
1	Rural Postal Life Insurance	170	3763	31223	3763	-
2	Life Insurance Corporation of India	3	30456	2468	-	-
A	New India Assurance	2	550	0.048	-	-

Sl. No.	Name of the Insurance	No. of branches	Policies issued	Sumassured (in cr)	No. of beneficiaries	Amount paid as compensation (in cr)
B	United India Insurance Co. Ltd	4	29061	1.704	951	1.58
C	National Insurance Company Ltd	1	4153	1.177	0	6.501
D	Oriental Insurance Company	1	293	2.93	293	-

Source: District handbook (2008-09), The Nilgiris

2.17 Co-operation

Co-operatives play an important role in the socio-economic development of the people of our country. The cooperation department is mainly concerned with agricultural cred6it, market agricultural produce, distribute fertilizers and essential commodities and with the legal framework which governs the functioning of all cooperatives in the district. The objective of the department is therefore to enable all the cooperatives that come within its fold to deliver services to the satisfaction of their members and public, to facilitate the functioning and the growth of all cooperatives. The different sector of cooperatives is primary land development banks, urban banks, weaver and industrial cooperatives, Khadi & village industries etc. The details on cooperative societies present in the district are presented in the Table 2.43.

Table 2.43 Cooperative societies in the district

Sl.No.	Co-operative societies	Number
1	Primary Land Development Banks	4
2	Co-operative Apex Banks (TBSC)	0
3	District Central Co-operative Banks Branches	0
4	Urban Banks (including Branches)	2
5	Primary Agricultural Credit Societies	74
6	Housing Co-operative Societies	7
7	Employment Co-operative Societies (thrift/credit)	41
8	Lift Irrigation societies	0
9	Weavers Co-operative societies	0
10	Industrial Co-operative societies `	20
11	Khadi & Village Industries	0
12	Primary Co-operative stores	17
13	Co-operative sugar mills	0
14	Co-operative marketing societies'	2
15	Other Co-operative societies	0
A	Whole stores	2
B	Lamp, Masinagudi	1
C	Land Colonization Society (KapalaPaniar Society)	1
D	Co-op district union	1

Sl.No.	Co-operative societies	Number
E	Co-op press	1
F	Students Co-op stores	57

Source: District hand book (2009-10)

2.18 Industries

Nilgiris has only a few industries. Perhaps the only industry which is widespread is tea. The tea factories which number more than 750 are spread out in the district. The tea leaves are plucked from the tea bushes are processed and packed in these factories. Manufacture of wooden tea chests is done in these factories as an ancillary industry. The district has a scope for the following activities in the all the blocks. They are tea industry, homemade chocolate industries, bakeries, food processing and value added industries, paper bags, plates, cloth bags etc., (Table 2.44).

Table 2.44 Industrial opportunities in the district

Sl. No.	Name of the block	Activities that are possible based on locally available raw materials
1	Ooty	Tea, Homemade Chocolates, Bakery
2	Coonoor	Tea, Food processing such as value added products
3	Kotagiri	Tea, Food processing such as value added products, Vegetables & fruits
4	Gudalur	Tea, spices, Bakery, Areca leaf plates, paper cups, plates, bags, cloth bags

Source: MSME Report, 2012

The medium and large scale industries are from floriculture, dehydrated vegetables, flavored tea, wooden furniture & fixtures, eucalyptus oil, herbal products, honey packaging & processing, mushroom processing, hotel industry, textiles, woolen garments. The other industries which have scope in the district are herbal hair oil industry, mixed fertilizers, science equipment's, wooden furniture's, field brushes, distillation of essential oil bearing plants, hair oil etc., The details on medium and large scale industries are presented in the Table 2.45.

Table 2.45 Medium & Large Scale Industries / Public Sector undertakings

Sl. No	Name & Address of the unit	Line of Activities	Capacity	No. of Persons employed
1	Rallis India Ltd., Ooty	Gelatine, Phosphery	2250 MT 7000 MT	328
2	The Nilgiris District Co-op. Milk Producers Union Ltd., Ooty.	Milk Butter Ghee Cheese	98.54 Lakh Lit 62.95 MT 45.30 MT 33.80 MT	297
3	Nestle India Ltd., Gudalur, The Nilgiris	Instant Tea	314 MT	83

Source: MSME Report, 2012

CHAPTER III

DEVELOPMENT OF AGRICULTURE AND ALLIED SECTORS

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

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

ii. Yield gap analysis for the major crops

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 15 year time series data from 1980-81 to 2011-12.

The compound growth rate was calculated for area, production and productivity for major crops using following formulae. The CGR measures the annual growth of any variable over a period of time and it is expressed in percentage.

$$Y_t = ab^t$$

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

The logarithmic form of the above equation is : ln Y = ln a + t ln b (or Log Yt = Log a + t log b

Where,

Y	=	Time series data of Area, Production & Yield of crop
t	=	Number of years varies from the value 1,2,3…n
a	=	Intercept or constant coefficient
b	=	Regression coefficient of t
r	=	Compound Growth Rate

The value of b is computed by using OLS method. Further the value of CGR in percentage was worked out using the formula: CGR = [Antilog b-1] × 100.

Average of area, production and productivity of major crops grown in the districts is given in the Table 3.1. From the table, it is inferred that Tea, Coffee, Carrot**,** Potato, Pepper, Cabbage and banana are the major crops cultivated in the district.

On an average (triennium ending average 2011-12) the district showed a cabbage output of 51923 tonnes in an area of 1048 ha with average yield of 50674 kg/ha. Tea is grown in an area of 56071. Carrot is the other major horticultural crop grown in an area of 2432 ha. Other crops like paddy, banana, ginger and cardamom are also grown in certain areas and made significant contributions to the farming community in terms of production, yield and income.

Table 3.1 Area, production and yield of major crops in Nilgiris district

(Triennium average ending 2014-15)

Sl. No.	Crops	Area	%	Production	Productivity
1	Paddy	216	0.30	1153	4387
2	Banana	752	1.05	33943	N.A.
3	Potato	1320	1.85	38580	29073
4	Tapioca	65	0.09	2128	32180
5	Carrot	2653	3.71	N.A	N.A
6	Beet root	386	0.54	N.A	N.A
7	Cabbage	401	0.56	31209	48350
8	Ginger	286	0.40	3134	6649
9	Cardamon	973	1.36	93	62
10	Pepper	1044	1.46	187	169
11	Tea	55579	77.73	N.A	N.A
12	Coffee	7824	10.94	N.A	N.A
	Total	**71500**	**100.00**		

N.A denotes Not Available

The Compound growth rates are shown in Table 3.2.

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

Sl.No.	Crops	CGR during 2005-06 to 2014-15 (%)		
		Area	Production	Productivity
1	Paddy	-40.59	-36.97	6.86
2	Banana	-3.22	-5.49	N.A
3	Potato	-2.30	5.85	8.33
4	Tapioca	1.77	-0.57	-2.28
5	Carrot	0.29	N.A	N.A
6	Beet root	31.40	N.A	N.A
7	Cabbage	-23.06	-22.01	1.36
8	Ginger	-15.96	-32.21	-19.33
9	Cardamom	-2.42	-2.47	N.A
10	Pepper	-6.48	-6.01	-2.14
11	Tea	-0.05	N.A	N.A
12	Coffee	1.03	N.A	N.A

The compound growth rate analysis revealed that except paddy, all other crops were showing increasing trend in the area. Paddy exhibited declining trend in area and production. Though the important crops like potato, tapioca, cabbage, ginger, cardamom and pepper showed positive trend on area, the production declines. This gap can be reduced by introduction of high yielding new varieties suitable for specific location.

The productivity of paddy and banana gets increased with decrease in area as well as production.

Finally, crops are grouped into four categories based on their trend pattern in compound growth rate. These results are presented in Table 3.3.

Table 3.3 Trend pattern based on Compound Growth Rate

Sl. No.	Crop Name	Area	Production	Productivity
1.	Tea	+	-	+
2.	Ginger			
3.	Carrot			
4.	Cabbage			
5.	Turnip			
6.	Radish			
7.	Coffee	-	+	+
8.	Cardamom			
9.	Pepper			
10.	Beetroot			
11.	Knolkhol			
12.	Garlic	-	-	+
13.	Potato			
14.	Paddy			
15.	Beans	+	+	-
16.	Cauliflower			
17.	Banana			
18.	Tapioca	-	-	-

+ = *Positive Trend***-**= *Negative Trend*

Tea, carrot, turnip and radish are in positive trend for area, production and productivity. In case of coffee, cardamom, pepper, Beetroot and knol khol the area is declined over the years but their production and productivity is increased. Garlic, potato and paddy are decreased in area and production and their productivity is increased with intense agriculture and introduction of new hybrids. Beans, cauliflower and banana are increased in area and production. But their corresponding productivity is decreased. Tapioca has shown decreased trend in all three categories such as area, production and productivity.

3.2 Projection on area, production and yield by 2023

Using the secondary data on area, yield and production of the major potential crops, the projected area, yield and production for these crops for the year 2022-23 were estimated and the results are shown in the following table. The planned efforts are utmost necessary to sustain the areas, production and productivity under these crops so

as to enhance the agricultural production by means of raising the productivities of these crops. Projected area, production and productivity for 2023 based on the current trend is given in the Table 3.4.

Table 3.4 Projected area, production and Productivity

Sl. No.	Crop Name	Area (Ha.)	Production (Tonnes)	Productivity (Tonnes/Ha.)
1	Tea	56573.69	534481.20	9.45
2	Coffee	7606.40	5377.51	0.71
3	Carrot	2274.00	62094.00	27.31
4	Potato	1709.00	38128.00	22.31
5	Cardamom	804.00	108.00	0.14
6	Pepper	1809.00	454.00	0.25
7	Banana	639.00	24328.00	38.10
8	Cabbage	972.00	68109.00	70.10
9	Beans	496.00	5170.00	10.42
10	Ginger	545.00	9673.00	17.74
11	Paddy	939.43	3248.67	3.46
12	Turnip	95.02	2161.38	22.75
13	Garlic	102.00	628.00	6.16
14	Beet root	181.00	4205.00	23.21
15	Radish	111.00	2618.00	23.50
16	Tapioca	72.00	2268.00	31.58
17	Cauliflower	14.00	334.00	24.70
18	Knolkhol	5.84	131.73	22.57

The area, production and yield were projected using CGR for the year' sup to 2015-16 and the results are furnished in the Table 3.5.

The major crops grown in the district are paddy, banana, potato, tapioca, carrot, beet root, cabbage, ginger, cardamom, pepper and plantation crops like tea and coffee. These crops account for the major share in the crop production in the district. Therefore, these twelve crops were focused as potential crops of the district and the scope for further expansion of their potentiality in terms of production has been explored.

From the Table 3.5, it could be inferred about the current pattern of changes (Growth rates) in the area, production and yield. The area under tea plantation in 2011-12 is around 56071 ha while in 2015-16 it is increased to 141445 ha with a gain of 85374 ha. The production and yield trend are not available. The increase in area indicates the increase in production and yield. The next potential crop is the coffee, it is grown in an area of 7288 ha (Triennium average ending 2011-12). During 2015-16, the

crop has potential of increase in area around 3260 ha with increase in production and yield.

The crops like ragi, ground nut and coconut showed a larger reduction of area over the period of time from the existing area. Reduction in area might be due to reduction in rainfall over the years of time. The increase in drought prone areas in the district leads to decrease in the area of cultivation of major crops. All these crops are high water requirement crops, so the necessity of large quantity of water arises ultimately resulting in reduction in the cropping area.

Most of the potential crops in the district showed an increasing trend in area except few crops like paddy and beet root. These two crops showed declining trend. Though there is increase in area, the crops like potato, tapioca, cabbage, ginger, cardamom and pepper showed decreasing trend in production. In order to sustain the overall production of major crops in the district, there is a need to arrest further decline in area and adequate measures should be taken to increase the productivity of the crops.

Alternatively, the crops like paddy, banana, potato, tapioca, carrot, ginger and cabbage showed the increasing trend in the area over the year. The carrot cultivation in the district is increased to about 5238 ha in 2015-16 from the existing carrot cultivation area in the district. The yield trend also showed a positive sign, it indicates that the increase in area will increase the production and ultimately the yield. Though, the production and productivity has been increased over the period, there are certain yield gaps, which can be overcome by the advanced production technologies evolved during the recent times.

Table 3.5 Projected Area, Production and Yield based for the major potential crops identified

Description	Paddy			Banana			Potato			Tapioca		
	Area	Pdn.	Yield	Area	Pdn.	Yield	Area	Pdn.	Yield	Area	Pdn.	Yield
Compound Growth Rate (%)	-15.134	-14.900	0.279	13.570	18.289	4.155	8.338	-3.352	1.906	4.297	-3.328	-0.464
Triennium Average ending 2011-12	433	1610	3734	958	41937	43797	1406	35864	25509	69	2392	34860
2012-13	369	1357	3676	1360	70486	51836	1547	32251	26252	68	2172	36048
2013-14	313	1155	3686	1544	83378	53990	1676	31170	26753	71	2100	35881
2014-15	266	983	3696	1754	98627	56233	1816	30125	27263	74	2030	35714
2015-16	226	837	3707	1992	116665	58570	1967	29115	27783	77	1962	35548

Description	Carrot			Beetroot			Cabbage			Ginger		
	Area	Pdn.	Yield	Area	Pdn.	Yield	Area	Pdn.	Yield	Area	Pdn.	Yield
Compound Growth Rate (%)	22.095	NA	NA	10.905	NA	NA	3.364	-0.697	-3.928	3.605	-1.038	-3.767
Triennium Average ending 2011-12	2432	NA	NA	365	NA	NA	1048	51923	50674	595	7736	12313
2012-13	4214	NA	NA	242	NA	NA	1165	52993	45493	661	6788	12873
2013-14	5145	NA	NA	269	NA	NA	1204	52624	43706	685	6718	12388
2014-15	6282	NA	NA	298	NA	NA	1245	52257	41989	709	6648	11921
2015-16	7670	NA	NA	330	NA	NA	1286	51893	40339	735	6579	11472

Description	Cardamom			Pepper			Tea			Coffee		
	Area	Pdn.	Yield	Area	Pdn.	Yield	Area	Pdn.	Yield	Area	Pdn.	Yield
Compound Growth Rate (%)	7.576	-4.742	0.000	7.011	-7.569	-0.985	21.243	NA	NA	15.353	NA	NA
Triennium Average ending 2011-12	773	72	93	1192	209	175	56071	NA	NA	7288	NA	NA
2012-13	744	56	93	1554	216	177	79362	NA	NA	9144	NA	NA
2013-14	801	53	93	1663	200	175	96221	NA	NA	10548	NA	NA
2014-15	862	51	93	1780	185	173	116662	NA	NA	12168	NA	NA
2015-16	927	48	93	1904	171	171	141445	NA	NA	14036	NA	NA

Area in Hectares; Production in Tonnes; Yield in Kg/ ha

3.3 Projected crop output based on potential yield

Based on the potential yield the corresponding projected yield was calculated and given in the table 3.6. To ensure attaining this output we have to concentrate on introducing the new technologies and hybrids. Apart from that, marketing infrastructural requirements should also be given focus for attaining this projected value.

Table 3.6 Projected output for 2023

Sl.No.	Crop Name	Projected output for 2023 (t/ha)
1	Tea	1414345.59
2	Coffee	19016.05
3	Carrot	68210.18
4	Potato	64093.60
5	Cardamom	192.86
6	Pepper	5448.00
7	Banana	25544.56
8	Cabbage	72869.83
9	Beans	5952.79
10	Ginger	9814.77
11	Paddy	4697.15
12	Turnip	2375.50
13	Garlic	1019.48
14	Beet root	5434.22
15	Raddish	3342.13
16	Tapioca	2873.07
17	Cauliflower	405.67
18	Knolkhol	145.89

3.4 Yield gap analysis

The yield gaps for these selected crops were much wider, ranging from 50 kgs in cardamom to 14000 kgs in Banana .Therefore, the best option for raising the production is to take efforts in bridging the existing yield gaps in a situation where the scope for increasing the area under the crops is very limited. Due to its hilly terrain nature of this district increasing the area of crop is big task. 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 locational advantage by way of production and supply of vegetables, fruits and flowers required to meet the growing demands.

Table 3.7 Yield gap analysis for major crop

Sl. No.	Crop Name	Variety	Potential Yield (t/ha) (A)	Progressive Yield (t/ha) (B)	Average Yield (t/ha) (C)	Yield Gap(t/ha)		
						I (A-B)	II (B-C)	III (A-C)
1	Tea	Athray (B/6/61)	25.00	12.50	9.50	12.50	3.00	15.50
2	Coffee	Selection - 795	2.50	1.00	0.70	1.50	0.30	1.80
3	Carrot	Clause F1	30.00	28.00	25.00	2.00	3.00	5.00
4	Potato	KufriJothi	37.50	33.75	21.78	3.75	11.97	15.72
5	Cardamom	Nallani	0.25	0.20	0.15	0.05	0.05	0.10
6	Pepper	Panniyur 1	3.00	2.00	1.50	1.00	0.50	1.50
7	Banana	Nenthran	40.00	39.00	25.00	1.00	14.00	15.00
8	Cabbage	Quizer	75.00	70.00	69.00	5.00	1.00	6.00
9	Beans	ArkaKomal	12.00	10.00	8.00	2.00	2.00	4.00
10	Ginger	Rio-de-Janeiro	18.00	17.00	16.32	1.00	0.68	1.68
11	Paddy	ADT43	5.00	4.13	3.44	0.87	0.69	1.56
12	Turnip	Purple top white globe	20.00	15.00	12.34	5.00	2.66	7.66
13	Garlic	Mettupalayam Local	10.00	10.00	6.05	0.00	3.95	3.95
14	Beet root	Ruby Queen	30.00	24.00	22.76	6.00	1.24	7.24
15	Radish	Nilgiri red	30.00	26.00	23.53	4.00	2.47	6.47
16	Tapioca	Mulluvadi	40.00	35.00	34.55	5.00	0.45	5.45
17	Cauliflower	Snow Mystique	30.00	28.00	25.81	2.00	2.19	4.19
18	Knolkhol	White Vienna	20.00	15.00	13.44	5.00	1.56	6.56

Table 3.8 Milk yield gaps of different animals in the blocks (2013-14)

Blocks	Milk yield	Cows		Buffalo	
		Local	Cross breed	Local	Cross breed
B1	**Potential**		15 kg	4	
	Actual	0	7 to 10 kg	2-2.5	
	Reason for low yield	Non availability of fodder especially in winter and summer		Nil	
B2	**Potential**		15 kg		
	Actual		7 to 10 kg		
	Reason for low yield	Non availability of fodder especially in winter and summer		Nil	
B3	**Potential**		12 to 15 kg		
	Actual		8 to 10 kg		
	Reason for low yield	Non availability of fodder especially in winter and summer		Nil	

Blocks	Milk yield	Cows		Buffalo	
		Local	Cross breed	Local	Cross breed
B4	**Potential**		10 kg		
	Actual		8 to 10 kg		
	Reason for low yield	Non availability of fodder especially in winter and summer			

B1- Udhagamandalam, B2 - Coonoor; B3 - Gudalur; B4 –Kotagiri

The yield gaps in milk production are furnished in the Table 3.8. The cross breed has huge potential of milk productivity of about 50 per cent. The milk production can be increased by making adequate supply of fodder during summer and winter.

3.5 Technological interventions and strategies to reduce the yield gaps

Introduction and development of new varieties and innovative production technologies are of prime importance to maximize the production and productivity, with zero residual toxicity and the potential available is enormous for horticulture development. Cultivation of these hilly horticulture crops is now modernized with improved high tech methods. These hi-tech methods or improved technologies should be disseminated to the farmers then and there.

The improved cultural operations of few hill horticulture crops suitable for the Nilgiris conditions are given in table 3.9.

Table 3.9 Technological interventions and strategies to reduce the yield gaps in Nilgiris district

Prioritized problems in these crops/ enterprise	Title of intervention	Technology options	Proposed Intervention
Crop: Tea Lack/updation of knowledge on new high yield tea clones	Assessment of high yielding tea clones and varieties	**High yielding varieties** suitable for the region Pandian (UPASI-10), Sundaram (UPASI-3), Golconda (UPASI-8), Jayaram (UPASI-2), Evergreen (UPASI-1), Athrey (UPASI-9), Brookeland (UPASI-6), BSS 1, BSS 2, BSS 3, BSS 4, BSS 5	On Farm Field Trial, Field Demonstration, clones Multiplication and Supply to the farmers, training etc.,
Lack of knowledge on selection of tea clones for specific location (For eg., Drought prone, wind prone, frost prone etc.,)	Demonstrations/ Trainings	**Drought prone areas -** UPASI-2, UPASI-9, ATK-1, TRI-2025, UPASI-20, UPASI-26, UPASI BSS-1 and BSS-2 clones are recommended **Wind prone areas -** Clones like UPASI-2, UPASI-10, C–1, CR–6017 and UPASI-26 are recommended. **Frost prone areas -**C–1, CR-6017,	Through training and demonstration, clones supply at subsidized rate

Prioritized problems in these crops/ enterprise	Title of intervention	Technology options	Proposed Intervention
Maintenance of adequate plant population to achieve better yield	Assessment of suitable planting technique for commercial cultivation	UPASI-15, UPASI-16 and UPASI-19 **New planting / replanting of tea clones -** UPASI-3, UPASI-8, UPASI-17, UPASI-25, UPASI-28, TRF-1, TRF-4, TRI-2023, TRI-2024 and TRI-2026. **Single Hedge System:** Planted at the spacing of 1.20 x 0.75 m accommodating 10,800 plants/ha. **Double Hedge System:** Planted at the spacing of 1.35 x 0.75 x 0.75 m accommodating 13,200 plants/ha.	Maintenance of adequate plant population to achieve better yield
Lack of exposure of rejuvenation of old tea plantations	Demonstration and training	**Rejuvenation pruning:** The whole bush should be cut near the ground level less than 30 cm with a view to rejuvenate the bushes. **Hard pruning:** Formation pruning of young tea at 30 to 45 cm (12" to 18") for proper spread of bushes. **Medium pruning:** To check the bush growing to an inconvenient height this type of pruning is done in order to stimulate new wood and to maintain the foliage at lower levels less than 60 cm. **Light pruning:** Pruning depends on the previous history of the bush raising the height of medium pruning by an inch or less to manageable heights for plucking (less than 65 cm). **Skiffing:** This is the lightest of all pruning methods. Remove the top 5 - 8 cm new growth to obtain a uniform level of pruning surface (more than 65 cm).	Field demonstrations, exposure visits, Training
Not practicing the standard norms of harvesting and lack of awareness on production cycle interval.	Through trainings and demonstrations	Plucking commences when the tea bush is 3 years old. The plucking of extreme tip of the growing branch consists of an unopened bud together with two leaves is popularly known as “Two leaves and a bud” while fine plucking is anything less than this.	Training and demonstrations, Supply of tea harvesters at potential blocks
Pests and diseases like red spider mite, tea mosquito bug blister blight and weeds are widely prevalent. The culturaloperations and the	Assessment of efficacy of pesticides and bio control agents	**Red spider mite** Spray Azadirachtin 1.0% EC (neembased)2.0 ml/lit or Profenofos 50 % EC2.0 ml/lit or Spiromesifen 22.9 % SC1.0 ml/lit. **Tea mosquito bug** Removal of alternate hosts like neem, cashew, guava in the surroundings.	Training and demonstrations, Supply of sticky traps in subsidized rate to control sucking pests

Prioritized problems in these crops/ enterprise	Title of intervention	Technology options	Proposed Intervention
recommended cultivation technology are also not being properly undertaken by the farmers. All these lead to a decline in yield.		When the infestation is lesser: Spraying of any one of the following: • Imidacloprid (0.6 ml/l) • Thiamethoxan (0.6 g /l) • oProfenophos (2 ml/l). **Blister blight** Spray Hexaconazole 200 ml + Copper oxychloride 210 g/ha at 5 days interval/ha. (or)Spray 210 g of Copper oxychloride and Nickel chloride per ha at 5 days interval from June – September, 11 days intervals in October and November (or)Copperoxychloride 210 g + 200 ml Propiconazole/ha at 10 days interval.	
Crop: Rice Non availability of suitable varieties for flood prone area Crop failure or heavy yield reduction due to water logging situation& pest, diseases	Assessment of suitable paddy variety for Nilgiris district	**Season -** *Samba (Jul-Aug),* **High Yielding Varieties -** CO 43, ADT(R) 46, ADT 39, CORH 4	Seed multiplication, OFT, Field demonstrations and Training
Uniform seed germination and to withstand stress	Training /demonstrations Production of Bio fertilizers	•Seed up gradation using egg floatation technique to remove ill filled and immature seed (with salt water of 1.13 specific gravity. •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)	Training /demonstrations Production of Bio fertilizers at TNAU Centres
Traditional system of cultivation in these areas yield less	Assessment of SRI technique in Hill stations	•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, Seed supply at subsidy, Seed multiplication at larger area

CHAPTER IV

DISTRICT PLAN

4.1 HORTICULTURE

4.1.1 Production Growth

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

Area expansion of Horticultural crops

a. Fruit Crops

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

b. Vegetable crops

Vegetables are the store houses of most of the vitamins and minerals and also proteins. In order to ensure continuous supply of fresh vegetables to the burgeoning urban markets, it is absolutely necessary to create forward linkages from rural to urban areas. This will also ensure assured income to farmers in the rural areas adjoining the cities. Cultivation of vegetables, formation of farmer clusters, formation of farmers society, collection centers,

reefer vans, retail outlets, mobile stores are the components to be promoted for increasing the productivity and marketing of vegetables.

c. Flower crops

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

d. Spice crops

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

e. Plantation crops

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

Improving Infrastructural facilities for production

To increase the income of the horticultural farmers, support for the establishment of pandals, trellies, staking and propping polygreen houses, (tubular structure) have to be provided. Vegetables like bitter gourd, snake gourd, ribbed gourd, pandal avarai, pole beans, tomato, gherkin, cucumber, squash and in fruits grapes, musk melons and in spices pepper etc could be cultivated under pandal cultivation. Similarly, crops like peas, musk

melon, pole beans, tomatoes, ivy gourd could be raised in trellies. High value vegetables like capsicum, beans and flowers like carnation, roses etc could be raised in poly houses.

Maintenance of Plantation

The existing fruit trees have to be maintained properly until they attain fruit bearing stage and thereafter up to economically profitable bearing stage. This calls for proper maintenance of fruit trees with appropriate intercultural operations periodically. Regular maintenance of orchards / fruit trees would enhance the production / productivity as well.

Area expansion by Precision Farming Technology

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

Area expansion by high density planting

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

Area expansion by Normal Planting

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

Protected cultivation

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

to enhance productivity. It is proposed to adopt high density planting in mango, guava and sapota in select districts of the State by providing subsidy.

Organic farming

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

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

Post-Harvest Management

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

Marketing Interventions

Interventions to build the marketing system are essential such that marketing expenses should be shifted as an expense towards an investment. It's important that interactions between farmers and market intermediaries should match the image of marketing portrays.

Capacity building

Capacity building of Horticultural Officers and Farmers

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

Bee Keeping

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

areas. Of late, it has been recognized that it has the potential to develop as a prime agri-horticultural and forest-based industry. Honey production is a lucrative business and it generates employment.

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

Mechanization in cultivation of horticultural crops

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

Micro Irrigation, Water harvesting and Management

With increasing demand on water from various sectors, the availability of water is under severe stress. Agriculture sector is the largest use of water. While irrigation projects (Major and medium) have contributed to the development of water resources, conventional methods of irrigation are inefficient and lead to wastage of water. It has been recognized that the use of modern irrigation methods like drip and sprinkler irrigation are the ways for the efficient use of surface as well as ground water resources.

Majority of fruit trees / orchards are under rainfed cultivation. It is advisable to bring a minimum percentage of the area under irrigation by providing and strengthening the water harvesting system. This includes provision of drip irrigation facilities wherever possible, recharge of defunct bore wells, provision of pipes and protected distribution system, provision of water lifting devices, Insitu water conservation and the like.

Special Interventions

Production Enhancement through Precision Farming

Farmers have experienced fruitful results of technology especially during the past five years. Hence further increase in the production of horticultural crops would be possible both by increasing area and productivity by adopting advanced technologies like precision farming, high density planting, protected cultivation, shade net nursery, integrated pest management and integrated nutrient management. Besides increasing infrastructure and mechanization facilities, productivity enhancement is considered by area expansion and resorting to high tech cultivation practices. Annual crops like vegetables, flowers, spices, medicinal plants and one year long season crops like banana, tapioca, turmeric and annual moringa could be considered for expansion by precision farming technology and providing assistance for inputs like water soluble fertilizers, hybrid/ high yielding vegetable seeds, plant protection chemicals etc., with subsidy.

Pandal / Trellis cultivation, Propping / Support / Staking

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

Banana Bunch Sleeve

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

Agro Ecosystem Analysis (AESA) based IPM

The IPM has been evolving over the decades to address the deleterious impacts of synthetic chemical pesticides on environment ultimately affecting the interests of the farmers. The economic threshold level (ETL) was the basis for several decades but in modern IPM (FAO 2002) emphasis is given to AESA where farmers take decisions based on larger range of field observations. Decision making in pest management requires a thorough analysis of the agro-ecosystem. Farmer has to learn how to observe the crop, how to analyze the field situation and how to make proper decisions for their crop management. This process is called the AESA. In AESA based IPM emphasis is given to natural enemies, plant compensation ability, abiotic factors and P: D ratio.

Control of coconut Red Palm weevil

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

Promotion of Roof top Garden / Potager garden

The traditional kitchen garden, also known as a potager is a space separate from the rest of the residential garden i.e. the ornamental plants and lawn areas. Most vegetable gardens are still miniature versions of old family farm plots, but the kitchen garden is different not only in its history, but also its design. The kitchen garden may serve as the central feature of an ornamental, all-season landscape, or it may be little more than a humble vegetable plot. It is a source of herbs, vegetables and fruits, but it is often also a structured garden space with a design based on repetitive geometric patterns. The kitchen garden has year-round visual appeal and can incorporate permanent perennials or woody shrub plantings around (or among) the annuals.

There are many types of vegetable gardens. The potager, a garden where vegetables, herbs and flowers are grown together, has become more popular than the more traditional rows or blocks.

Some popular culinary herbs in temperate climates are to a large extent still the same as in the medieval period. Herbs often have multiple uses. For example, mint may be used for cooking, tea, and pest control.

Perimetro Vegetable Cluster Development Programme

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

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

Establishing Centre of Excellence for different crops

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

Computerization and Governance

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

Research on Crop Diversification

Crop Diversification refers to a shift from the regional dominance of one crop to regional production of a number of crops, to meet ever increasing demand of cereals,

pulses, vegetables, fruits, oilseeds, fibres, fodder, grasses etc. It aims to improve soil health and to maintain dynamic equilibrium of the agro-ecosystem. In the instant case, crop diversification is intended to promote technological innovations for sustainable agriculture and enable farmers to choose crop alternatives for increased productivity and income.

Tissue Culture Unit

Plant tissue culture is a collection of techniques used to maintain or grow plant cells, tissues or organs under sterile conditions on a nutrient culture medium of known composition. Plant tissue culture is widely used to produce clones of a plant in a method known as micro propagation.

Plant tissue culture relies on the fact that many plant cells have the ability to regenerate a whole plant (totipotency). Single cells, plant cells without cell walls (protoplasts), pieces of leaves, stems or roots can often be used to generate a new plant on culture media given the required nutrients and plant hormones. Although some growers and nurseries have their own labs for propagating plants by the technique of tissue culture, additional number of laboratories need to be created to provide custom propagation services and commercially viable plants to propagate in a laboratory.

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 everyday consumption. They have created a space in a common man’s kitchen. Also, current trend of consumption conveys the opportunity that lies in the area of mushroom exports.

Rainfed Area Development Programme (RADP)

Rainfed areas assume special significance in terms of ecology, agricultural productivity and livelihood for millions of rural households in India.

To ensure agriculture growth in the rainfed areas, the Government of India launched a new scheme “Rainfed Area Development Programme (RADP)” in the year 2011-12 as a sub-scheme under Rashtriya Krishi Vikas Yojana (RKVY).

It aims at improving quality of life of farmers especially, small and marginal farmers by offering a complete package of activities to maximize farm returns. RADP focuses on Integrated Farming System (IFS) for enhancing productivity and minimizing risks associated with climatic variabilities.

Infrastructure Development

Mushroom production

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

Supporting structures for vegetable production

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

a. Staking, trellis and propping

Though most vegetables grow on their own, plants with vining and sprawling growth or with brittle stems and heavy fruits need support. Peas, cucumbers, pole beans, tomatoes, squash, eggplants and peppers benefit from trellising, caging or staking. The trick to heavy harvests knows which vegetable support system works best for each plant. Trellising, which involves tying plant stems to vertical structures with garden twine or plant ties, allows you to fit more plants in the garden. It is the preferred support method for peas, indeterminate vine-type tomatoes, pole and runner beans, cucumbers and smaller squash varieties.

b. Pandal structure

Pandal vegetables, being short duration crops, fit very well in the intensive cropping system. It offers viable option for the growers to get increased income per unit area. It

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

District Horticulture Information and Training Centre

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

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

Community Seed Bank

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

Modernization of State Horticulture Farms

In Tamil Nadu, there are 52 State Horticulture Farms including six parks and garden. The prime objectives of these farms are to produce pedigree planting materials of fruits, flowers, spices and vegetables. The quality planting materials produced in these farms are distributed to the farmers directly and through various schemes of the department. The parks and garden serve as study centre to the students apart from educating the public on Eco preservation.

It is programmed to expand the production of planting materials of various kinds of fruits viz., mango, guava, sapota and flowers like rose, jasmine and ornamental plants and avenue trees by modernizing the nurseries, developing the farms as demonstration centres for the latest techniques in horticulture, enhancing the productivity and augmenting farm mechanization for increasing the efficiency. It is aimed to enhance the productivity levels of orchard crops by 30 per cent and increase the production level of planting materials by 25 per cent.

Crop Insurance

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

Horticultural mechanization

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

Micro irrigation in horticultural crops

Micro-irrigation will generally use less than half the volume of water required by the more traditional ‘watering’ systems such as sprinkler irrigation. Lower pressures used mean less energy for pumping while precise placement of more exact water volumes enhances and improves water management. Micro Irrigation system scales down requirement of labour and takes care of application of fertilizers.

Conducting Field Days / Shows and Farmer's mela

Regular training programmes on relevant topics for Upgradation of knowledge and skill of extension functionaries of development department and farmers are essential. Apart from this, exhibition, horticulture show, Farmers' Mela, Field Days in farmer's field and Frontline Demonstrations to demonstrate technologies are to be regularly conducted.

Budget

The total cost of the project for 5 years is estimated as Rs. **9704.88** lakhs.

Implementing Agency

The projects will be implemented by the Department of Horticulture

Table 4.1 Budget for strengthening of Horticulture

(₹. in lakhs)

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
A	**Production Growth**															
I	**Area expansion of fruit crops**															
1	TC Banana & TC Pineapple	Ha	1.25	B2	50	62.50	50	62.50	50	62.50	50	62.50	50	62.50	250	312.50
2	Normal Planting in lime / lemons	Ha	0.6	All Blocks	50	30.00	50	30.00	50	30.00	50	30.00	50	30.00	250	150.00
3	Normal planting in Avacado	Ha	0.6	B2	10	6.00	10	6.00	10	6.00	10	6.00	10	6.00	50	30.00
4	Commercial production of choice fruits (Kiwi, Mangoosteen, Rambutan, Fig, Date palm, Durian, Carambola, Dragon fruit,Passion Fruit, Kiwi, Grapes, Strawberry, etc.,)	Ha	1.25	B2	10	12.50	10	12.50	10	12.50	10	12.50	10	12.50	50	62.50
II	**Area expansion of vegetable crops**															
5	Peas & Beans	Ha	0.5	B1 & B3	50	25.00	50	25.00	50	25.00	50	25.00	50	25.00	250	125.00

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.
6	Cauliflower	Ha	0.5	All Blocks except B2	20	10.00	20	10.00	20	10.00	20	10.00	20	10.00	100	50.00
7	Cabbage	Ha	0.5	B3 & B4	100	50.00	100	50.00	100	50.00	100	50.00	100	50.00	500	250.00
8	Potato	Ha	0.5	All Blocks except B2	100	50.00	100	50.00	100	50.00	100	50.00	100	50.00	500	250.00
9	Caroot	Ha	0.5	All Blocks except B3	500	250.00	500	250.00	500	250.00	500	250.00	500	250.00	2500	1250.00
10	Chowchow	Ha	0.5	B1 and B3	20	10.00	20	10.00	20	10.00	20	10.00	20	10.00	100	50.00
11	Radish	Ha	0.5	All Blocks except B2	20	10.00	20	10.00	20	10.00	20	10.00	20	10.00	100	50.00
12	Beetroot	Ha	0.5	All Blocks except B2	50	25.00	50	25.00	50	25.00	50	25.00	50	25.00	250	125.00
13	Tapioca	Ha	0.5	B2	10	5.00	10	5.00	10	5.00	10	5.00	10	5.00	50	25.00
14	Cultivation of hybrid Vegetables under protected structures	1000 Sq.m	1.4	B3	5	7.00	5	7.00	5	7.00	5	7.00	5	7.00	25	35.00
III	**Area expansion of Medicinal and Aromatic plants**															

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.
15	Rosemary	Ha	1	B4	5	5.00	5	5.00	5	5.00	5	5.00	5	5.00	25	25.00
IV	**Area expansion of Spices crops**															
16	Seed and Rhizomatic spices (Coriander, Turmeric, Ginger, Dry Chilly, Cumin, Fennel, Fenu greek, Dil, Cardamom etc.,)	Ha	0.3	B2	100	30.00	100	30.00	100	30.00	100	30.00	100	30.00	500	150.00
17	Perennial spices (Pepper, Curry leaf, All spice, Cinnamon, Clove, Tamarind, Nut meg etc.,)	Ha	0.5	B2	150	75.00	150	75.00	150	75.00	150	75.00	150	75.00	750	375.00
18	Bulbous spices Garlic	Ha	0.5	B1 & B4	125	62.50	125	62.50	125	62.50	125	62.50	125	62.50	625	312.50
V	**Area expansion of Flower crops**															
19	Cost of planting material & cultivation of carnation & Gerbera under poly house / Shade net	1000 Sq.m	6.1	All Blocks except B2	10	61.00	10	61.00	10	61.00	10	61.00	10	61.00	50	305.00

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.
	house															
20	Cost of planting material & cultivation of Rose, Lilium, under poly house / Shade net house	1000 Sq.m	4.26	B3 & B4	10	42.60	10	42.60	10	42.60	10	42.60	10	42.60	50	213.00
VI	**Area expansion /Gap filling of Plantation crops**															
21	Arecanut	Ha	0.5	B2	10	5.00	10	5.00	10	5.00	10	5.00	10	5.00	50	25.00
VII	**Rejuvenation/I NM-IPM/Mulching/ Anti bird net**															
22	INM/IPM for Horticultural crops	Ha	0.04	All Blocks	100	4.00	100	4.00	100	4.00	100	4.00	100	4.00	500	20.00
23	Anti Bird net	1000 Sq.m	0.35	All Blocks except B2	20	7.00	20	7.00	20	7.00	20	7.00	20	7.00	100	35.00
VIII	**Pollination Support through Bee Keeping**															
24	Bee hive & Colony	No	0.04	All Blocks except	100	4.00	100	4.00	100	4.00	100	4.00	100	4.00	500	20.00

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.
				B2												
25	Honey Extractor	No	0.2	All Blocks except B2	5	1.00	5	1.00	5	1.00	5	1.00	5	1.00	25	5.00
IX	**Organic Farming**															
26	Organic farming and PGS certification in 50 acre cluster	1 cluster	14.95	B1 & B2	2	29.90	2	29.90	2	29.90	2	29.90	2	29.90	10	149.50
27	HDPE Vermibed	No	0.16	B2 & B3	15	2.40	15	2.40	15	2.40	15	2.40	15	2.40	75	12.00
X	**Rainfed Area development**															
28	Moisture stress management - Minimum irrigation gurantee by PUSA hydrogel	Ha	0.1	All Blocks	100	10.00	100	10.00	100	10.00	100	10.00	100	10.00	500	50.00
B	**Infra structures and Assets creation**															
1	Poly Green House	1000 Sq.m	9.35	All Blocks except B2	10	93.50	10	93.50	10	93.50	10	93.50	10	93.50	50	467.50
2	Shadenet	1000 Sq.m	7.1	B2	10	71.00	10	71.00	10	71.00	10	71.00	10	71.00	50	355.00
II	**Mushroom production**															
3	Mushroom production and compost making	1 No.	20	B3	2	40.00	2	40.00	2	40.00	2	40.00	2	40.00	10	200.00

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
4	Cottage mushroom unit	1 No.	1	All Blocks except B2	10	10.00	10	10.00	10	10.00	10	10.00	10	10.00	50	50.00
III	**Vermicompost unit**															
5	Permanent Vermicompost Unit	600 cu.ft	1	B2	10	10.00	10	10.00	10	10.00	10	10.00	10	10.00	50	50.00
IV	**Supporting structures for Horticulture crop production**															
6	Permanent Pandhal structure	Ha	4	B1 & B3	10	40.00	10	40.00	10	40.00	10	40.00	10	40.00	50	200.00
V	**District Horticulture information and training centre**															
VI	**Community seed bank**															
C	**Special interventions**															
7	Farm deficiency correction	Ha	0.04	All Blocks	1000	40.00	1000	40.00	1000	40.00	1000	40.00	1000	40.00	5000	200.00
8	Promotion of Roof top Garden/ Potager garden Kit	No	0.005	All Blocks	500	2.50	500	2.50	500	2.50	500	2.50	500	2.50	2500	12.50
9	Promotion of Roof top Garden/	No	0.0735	All Blocks	500	36.75	500	36.75	500	36.75	500	36.75	500	36.75	2500	183.75

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.
	Potager garden Kit with shadenet															
10	AESA based IPM in fruits and vegetables Pheramone trap	Ha	0.04	All Blocks except B2	100	4.00	100	4.00	100	4.00	100	4.00	100	4.00	500	20.00
11	AESA Based IPM in fruits and vegetables Yellow sticky trap	Ha	0.04	All Blocks except B2	100	4.00	100	4.00	100	4.00	100	4.00	100	4.00	500	20.00
12	AESA Based IPM in fruits and vegetables Light trap	Ha	0.08	All Blocks except B2	100	8.00	100	8.00	100	8.00	100	8.00	100	8.00	500	40.00
D	**Post Harvest Management**															
13	Pack house (9m X 6m)	1 No	4	All Blocks except B2	5	20.00	5	20.00	5	20.00	5	20.00	5	20.00	25	100.00
14	Drying yard	1 No	5	All Blocks except B1	5	25.00	5	25.00	5	25.00	5	25.00	5	25.00	25	125.00
15	Refer van/collection vehicle	1 No	26	B3	1	26.00	1	26.00	1	26.00	1	26.00	1	26.00	5	130.00
E	**Development of Farms, Nurseries and Parks**															
16	Developmental activities in new/ exsisting state	No	25	All Blocks except	13	325.00	13	325.00	13	325.00	13	325.00	13	325.00	65	1625.00

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.
	Horticultural farm, Keelapalur			B3												
F	**Mechanization - Machineries, Equipments & Tools**															
17	Power tiller/Tractor/Minitractor	Nos	1	All Blocks	10	10.00	10	10.00	10	10.00	10	10.00	10	10.00	50	50.00
18	Potato planter/Potato harvester / Onion harvester	No	0.3	All Blocks except B2	5	1.50	5	1.50	5	1.50	5	1.50	5	1.50	25	7.50
19	Hand operated sprayer with face mask	Nos	0.025	All Blocks	200	5.00	200	5.00	200	5.00	200	5.00	200	5.00	1000	25.00
20	Plastic crates for vegetable & fruits handling	No of sets containing 10crates	0.075	All Blocks except B2	500	37.50	500	37.50	500	37.50	500	37.50	500	37.50	2500	187.50
21	Oil engine	No	0.15	All Blocks	300	45.00	400	60.00	400	60.00	400	60.00	400	60.00	1900	285.00
22	5 layered Polythene spread sheets for drying horticulture produce	No	0.16	All Blocks	50	8.00	50	8.00	50	8.00	50	8.00	50	8.00	250	40.00
23	Aluminium Ladders for Harvesting	No	0.2	B2 & B3	50	10.00	50	10.00	50	10.00	50	10.00	50	10.00	250	50.00
G	**Water / Irrigation**															

Sl. No.	Interventions	Unit	Unit cost	Blocks covered	2017-2018		2018-2019		2019-2020		2020-2021		2021-2022		Total	
					Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.	Phy.	Fin.
	Management															
24	Sprinkler	No	0.195	All Blocks	400	78.00	400	78.00	400	78.00	400	78.00	400	78.00	2000	390.00
25	Community Tank / On Farm Pond	No	20	B2	2	40.00	2	40.00	2	40.00	2	40.00	2	40.00	10	200.00
H	**Capacity Building**															
26	Training to farmers within the State. 2 days Rs.1000/farmer/ day	No	0.02	All Blocks	500	10.00	500	10.00	500	10.00	500	10.00	500	10.00	2500	50.00
27	Training to farmers outside the state. 30 farmers/Batch	No	0.105	All Blocks	20	2.10	20	2.10	20	2.10	20	2.10	20	2.10	100	10.50
28	Exposure visit to farmers for 5 days. Rs.1000/farmer/ day	No	0.05	All Blocks	20	1.00	20	1.00	20	1.00	20	1.00	20	1.00	100	5.00
29	Training to farmers at HTC	No	0.0025	All Blocks except B2	10	0.03	10	0.03	10	0.03	10	0.03	10	0.03	50	0.13
30	Exposure visit of farmers outside India	No	4	B1 & B4	2	8.00	2	8.00	2	8.00	2	8.00	2	8.00	10	40.00
31	Training to staff outside the state / Batch of 5 members	No	0.04	All Blocks	5	0.20	5	0.20	5	0.20	5	0.20	5	0.20	25	1.00

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.
32	Training to staff outside India	No	6	B3 & B4	2	12.00	2	12.00	2	12.00	2	12.00	2	12.00	10	60.00
33	District level seminar	No	2	B4	1	2.00	1	2.00	1	2.00	1	2.00	1	2.00	5	10.00
34	Computerization & governance	No	1	B4	1	1.00	1	1.00	1	1.00	1	1.00	1	1.00	5	5.00
35	Publicity and Documentation	No	0.5	All Blocks	4	2.00	4	2.00	4	2.00	4	2.00	4	2.00	20	10.00
I	**Crop Insurance and Risk Mitigating schemes**															
36	Crop Insurance	Ha	0.025	All Blocks	100	2.50	100	2.50	100	2.50	100	2.50	100	2.50	500	12.50
	Grand total					**1928.98**		**1943.98**		**1943.98**		**1943.98**		**1943.98**		**9704.88**

Connor - B1, Gudalur - B2, Kothagiri - B3, Udhagai - B4

4.2 AGRICULTURAL ENGINEERING

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

Strategies:

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

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

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

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

Expected outcome

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

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

Budget

The budget requirement for fulfilling the various interventions is ₹ **1144.74** lakh. The details of budget requirement for each intervention across the blocks are shown in Table 4.2.

Implementing agency

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

Table 4.2 Budget Requirement for Agricultural Engineering

(₹ In lakhs)

Sl. No.	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	**Capacity Building**															
2	**Demonstration of Agricultural Machinery**	All Blocks	No's/Ha	0.04	20	0.80	20	0.80	15	0.60	15	0.60	15	0.60	85	3.40
3	**Training of farmers**	B2, B3,B4	No's/Ha	0.04	70	2.80	70	2.80	70	2.80	50	2.00	50	2.00	310	12.40
4	**Training of Rural Youth in workshops**	B2, B3,B4	No's/Ha	0.04	30	1.20	30	1.20	30	1.20	30	1.20	30	1.20	150	6.00
5	Tractor (15-20 PTO HP)	All Blocks	No's/Ha	4	4	16.00	4	16.00	4	16.00	4	16.00	4	16.00	20	80.00
6	Tractor (40-70 PTO HP)	All Blocks	No's/Ha	8.5	6	51.00	6	51.00	3	25.50	3	25.50	3	25.50	21	178.50
7	**Power Tillers**															
8	Power Tiller (8 BHP & above)	All Blocks	No's/Ha	1.75	7	12.25	7	12.25	7	12.25	7	12.25	7	12.25	35	61.25
9	**a. Land Development, tillage and seed bed preparation equipments**															
10	Cultivator	All Blocks	No's/Ha	0.2	2	0.40	2	0.40	2	0.40	2	0.40	2	0.40	10	2.00
11	Rotavator	All Blocks	No's/Ha	0.35	4	1.40	4	1.40	4	1.40	4	1.40	4	1.40	20	7.00

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
12	**b. Sowing Planting, Reaping and Digging Equipments:**															
13	Post Hole Digger	All Blocks	No's/Ha	0.8	2	1.60	2	1.60	2	1.60	2	1.60	2	1.60	10	8.00
14	**c. Intercultivation Equipments**															
15	Power Weeder (engine operated below 2 BHP)	All Blocks	No's/Ha	0.25	4	1.00	4	1.00	4	1.00	4	1.00	4	1.00	20	5.00
16	**e. Harvesting and Threshing equipments**															
17	Brush Cutter	All Blocks	No's/Ha	0.25	70	17.50	70	17.50	70	17.50	70	17.50	70	17.50	350	87.50
18	**Tractor (above 20-35 BHP) driven equipments**															
21	**a.Land Development, tillage and seed bed preparation equipments**															
22	Cultivator	All Blocks	No's/Ha	0.3	6	1.80	6	1.80	3	0.90	3	0.90	3	0.90	21	6.30
23	Rotavator	All Blocks	No's/Ha	0.95	6	5.70	6	5.70	3	2.85	3	2.85	3	2.85	21	19.95
24	**Plant protection 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
25	Manual sprayer: Knapsack/foot operated sprayer	All Blocks	No's/Ha	0.015	215	3.23	215	3.23	215	3.23	215	3.23	215	3.23	1075	16.13
26	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity 8-12 lts)	All Blocks	No's/Ha	0.06	10	0.60	10	0.60	10	0.60	10	0.60	10	0.60	50	3.00
27	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity above 12-16 lts)	All Blocks	No's/Ha	0.08	50	4.00	50	4.00	50	4.00	50	4.00	50	4.00	250	20.00
28	Powered Knapsack Sprayer/Power operated Taiwan sprayer (capacity above 16 lts)	All Blocks	No's/Ha	0.1	25	2.50	25	2.50	25	2.50	25	2.50	25	2.50	125	12.50
29	**Establishment of Farm Machinery Banks for Custom Hiring**	B2, B3,B4	No's/Ha	28	1	28.00	2	56.00	1	28.00	0	0.00	0	0.00	4	112.00
30	**Promotion of Farm Mechanization in Selected Villages**	All Blocks	No's/Ha	11.5	2	23.00	1	11.50	0	0.00	0	0.00	0	0.00	3	34.50

Sl. No.	Interventions	Blocks Covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
31	**Financial assistance for promotion of Mechanized Farming operations**	All Blocks	No's/Ha	0.04	20	0.80	20	0.80	20	0.80	20	0.80	20	0.80	100	4.00
32	**Solar Energy**															
33	**5 hp**	All Blocks	No's/Ha	3.75	14	52.50	14	52.50	10	37.50	10	37.50	12	45.00	60	225.00
34	**Other machineries**															
35	TEA HARVESTER	All Blocks	No's/Ha	0.25	35	8.75	35	8.75	35	8.75	35	8.75	35	8.75	175	43.75
36	**Information Technology (IT) related items**															
37	Computer & its accessories	All Blocks	No's/Ha	0.8	0	0.00	5	4.00	3	2.40	2	1.60	4	3.20	14	11.20
38	Tablet (Tab)	All Blocks	No's/Ha	0.25	0	0.00	19	4.75	5	1.25	0	0.00	0	0.00	24	6.00
39	Xerox machine	B2, B3,B4	No's/Ha	1.5	0	0.00	3	4.50	2	3.00	0	0.00	2	3.00	7	10.50
40	**Self propelled / other power driven Horticultural 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
41	Chain saw/ Wheel barrow/ Mango grader/ planter and other suitable self propelled machineries and equipments for horticulture Crops	All Blocks	No's/Ha	1	0	0.00	20	20.00	20	20.00	10	10.00	20	20.00	70	70.00
42	**Manual Horticultural Equipments**															
43	Aluminium Ladder/ Ladder	All Blocks	No's/Ha	0.2	0	0.00	10	2.00	5	1.00	0	0.00	10	2.00	25	5.00
44	Aluminium pole	All Blocks	No's/Ha	0.03	0	0.00	10	0.30	0	0.00	0	0.00	0	0.00	10	0.30
45	Plucker	All Blocks	No's/Ha	0.02	0	0.00	5	0.10	5	0.10	0	0.00	0	0.00	10	0.20
46	**Post Harvest Equipments for food grains, oil seeds and Horticultural Equipments**															
47	All types of Washing Machines (for all type of Horticulture / Food grain / Oil seed crop)	All Blocks	No's/Ha	1.5	0	0.00	3	4.50	3	4.50	3	4.50	3	4.50	12	18.00

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
48	**Construction of Agricultural Engineering Extension centres (AEECs)**		No's/Ha	75	0	0.00	1	75.00	0	0.00	0	0.00	0	0.00	1	75.00
49	**Training of AED Engineers on " Agricultural Processing" and " Bio-Energy"**	All Blocks	No's/Ha	0.04	0	0.00	2	0.08	3	0.12	2	0.08	2	0.08	9	0.36
	Grand total					**236.83**		**368.56**		**201.75**		**156.76**		**180.86**		**1144.74**

B1-Gudalore, B2-Coonore, B3-Kotagiri, B4-Ooty

4.3 AGRICULTURAL MARKETING

India is an agricultural country and one third population depends on the agricultural sector directly or indirectly. Agriculture remains as the main stray of the Indian economy since times immemorial. Indian agriculture contribution to the national gross domestic product (GDP) is about 25 per cent. With food being the crowning need of mankind, much emphasis has been on commercializing agricultural production. For this reason, adequate production and even distribution of food has of late become a high priority global concern.

Agricultural marketing is mainly the buying and selling of agricultural products. In earlier days when the village economy was more or less self-sufficient the marketing of agricultural products presented no difficulty as the farmer sold his produce to the consumer on a cash or barter basis.

Today's agricultural marketing has to undergo a series of exchanges or transfers from one person to another before it reaches the consumer. There are three marketing functions involved in this, i.e., assembling, preparation for consumption and distribution. Selling on any agricultural produce depends on some couple of factors like the demand of the product at that time, availability of storage etc. The products may be sold directly in the market or it may be stored locally for the time being. Most of the agricultural products in India are sold by farmers in the private sector to moneylenders (to whom the farmer may be indebted) or to village traders. Products are sold in various ways. For example, it might be sold at a weekly village market in the farmer's village or in a neighboring village. If these outlets are not available, then produce might be sold at irregularly held markets in a nearby village or town, or in the mandi.

The Vision of the Department of Agricultural Marketing &Agri Business is to ensure fair price to the farming community who are left behind in the competitive marketing scenario and the mission of achieving this is by enforcing the existing act and rules most effectively and also by devising, implementing new technologies aimed at reducing pre and post-harvest losses through appropriate methods and encourage value addition. Green Revolution initiatives achieved self-sufficiency by increasing food grains production. Simultaneously, several initiatives have been taken to promote agricultural marketing in the state. Agricultural Marketing infrastructure plays a pivotal role in fostering and sustaining the tempo of rural economic development. Marketing is as critical to better performance in agriculture as farming itself.

Agri Business is a process, which starts with a decision to produce a saleable farm commodity and it involves all the aspects relating to pre and post-harvest operations including grading, value addition, packaging, processing and transportation. These operations add value to farm produce. The Department of Agricultural Marketing, which is functioning since 1977, with the main objective of Regulation of Agricultural Marketing, was renamed in the year 2001 as Department of Agricultural Marketing and Agri. Business in order to focus on other activities like Agri Export, Post-Harvest Management, Food Processing, etc.

Drying yard

A market yard is a place where marketing of agricultural produce is performed and it is also a place where agencies related to agricultural marketing are located. Therefore, from the structural point of view the agricultural market yard is different from other market-places. About 5 – 10% of post-harvest losses are occurring in grains. In order to minimize the post-harvest losses in grains, the Department has started construction of drying yards at village level from 1997. Every market is supposed to have a standard layout in which there are adequate infrastructural facilities. One of the main objectives of regulated marketing is to construct a planned market yard, where all the facilities are available.

The well designed market yards, besides providing facilities for storage and sale of agricultural produce, etc., also provide facilities for sale of agricultural inputs, banking and insurance. There are also consumer stores where farmers can buy their requirements, a post office, veterinary dispensary, etc.

Storage godowns

Storage is an important marketing function, which involves holding and preserving goods from the time they are produced until they are needed for consumption. The storage of goods, therefore, from the time of production to the time of consumption, ensures a continuous flow of goods in the market. Storage protects the quality of perishable and semi-perishable products from deterioration. It helps in the stabilization of prices by adjusting demand and supply. Storage is necessary for some period for performance of other marketing functions. Storage provides employment and income through price advantages.

e- learning centre

The importance of e-learning in the process of development cannot be denied and evidence exist that the need to improve agricultural education in the world is in the rise.

Several options can be applied however e-learning has been chosen as a point of discussion due to its potential to bring development in rural and developing areas. E-learning presents effective and efficient means of delivering quality education to farmers. Learners are motivated and enjoy learning whilst teacher can explore a variety of teaching methods that have far reaching and significant impact on learner's performance. E-learning has shown potential to greatly boost agricultural and education sector of developing countries. So there is a need to create an enabling environment for implementation of e-learning in agricultural education. It is recommended that legislative and national frameworks need to be developed to guide both public and private sector, particularly institutions of higher learning.

Uzhavar Sandhais

The first Uzhavar Sandhai was inaugurated in Madurai with 103 Uzhavar sandhai. Based on the success of 103 Uzhavar sandhais and good patronage of public in the succeeding years more number of Uzhavar Sandhai were formed in many places. The Uzhavar Sandhai are maintained by the Market Committees of the Department of Agricultural Marketing and Agribusiness. The objective of the scheme was to promote direct contact between farmers and consumers, through which the former can get full profit without middlemen or brokers. . If well managed, Uzhavar Sandhai can play a big role in boosting the farmer's confidence apart from several other obvious benefits to the consumers.

FPO (Farmer Producer Organization)

To build a prosperous and sustainable agriculture sector by promoting and supporting member-owned producer Organizations, that enable farmers to enhance productivity through efficient, cost-effective and sustainable resource use and realize higher returns for their produce, through collective action supported by the government, and fruitful collaboration with academia, research agencies, civil society and the private sector. The FPO will do the direct marketing after procurement of agricultural produce. This will enable members to save in terms of time, transaction costs, weighment losses, distress sales, price fluctuations, transportation, quality maintenance etc. The FPO will provide various insurance like Crop Insurance, Electric Motors Insurance and Life Insurance.

Exposure visits and Marketing training

Exposure visit (within the state and outside the state) helps to farmers to aware about the diversified cultivation practices in and around the state and to know the different advanced technologies and practices from the other farmers and farms.

Farmers frequently consider marketing as being their major problem. However, while they are able to identify such problems as poor prices, lack of transport and high post-harvest losses, they are often poorly equipped to identify potential solutions. Successful marketing requires learning new skills, new techniques and new ways of obtaining information.

Strategies

The proposed interventions will promote the Agri-business practices and models required to support Agri-business development, allowing the sector to contribute to the economic growth especially in rural areas. New Agri-business practices will be introduced relating to (i) farmers and entrepreneurs engaging service providers to solve specific technology problems (ii) learning to work together in the value-chain (iii) making effective use of market intelligence in decision making and (iv) making investments in supply-chain infrastructure and market places.

Rather than starting from a production point of view, stakeholders are encouraged to start from understanding market requirements and opportunities. The interventions will help stakeholders to access the relevant technologies and knowledge services needed for realizing the identified profit opportunities.

Components

- Promotion of commodity groups and market information through e learning centre in Conoor block
- Construction of Storage godown for commodity groups in all the blocks
- Construction of drying yards in all blocks
- Upgradation of rural shandies and uzhavar shandies in Udhagai and Conoor block
- Strengthening of Regulated Markets in all blocks
- Formation of Farmer Producer Organizations (FPO) in all blocks
- Potato harvester in Udhagai block

- Promotion of cold storage facilities
- Distribution of plastic crates to vegetable commodity group farmers
- Solar drier in all blocks
- Exposure visit (within state & outside state) for commodity group farmers to acquire value addition technologies in all blocks

Budget

It is proposed to incur ₹. **961.00** lakhs over a period of five year.

Expected Outcome

The interventions will promote entrepreneurs by organizing trainings and exposure visits. Farmers are facilitated to use drying yards, storage godowns, Agri business incubation center, Processing Technology marketing center and market provisions to market good quality graded products. It will also avoid distress sale by storing their agricultural produce. It helps them to get loans during storage period and sell it when the market price is high. This will strengthen the economic condition of the farmers as well as habituate them for grading, drying, sorting and storing.

Implementing Agency

Agricultural Marketing and Agri Business Department will implement the programs.

Table 4.3 Budget for strengthening of Agricultural Marketing and Agri-Business

(₹. in lakhs)

Sl. No.	Intervention	Unit (Nos.)	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	Promotion of Commodity Groups and Market Information															
1	e-learning Centre	Nos.	100	B1	1	100.00		0.00		0.00		0.00		0.00	1	100.00
	Strengthening of Uzhavar Sandhai and Regulated Market	Nos.				0.00		0.00		0.00		0.00		0.00	0	0.00
2	Drying Yard	Nos.	4	All Blocks	3	12.00	2	8.00	1	4.00	0	0.00	6	24.00	12	48.00
3	Storage godown	Nos.	25	All Blocks	0	0.00	6	150.00	4	100.00	0	0.00	0	0.00	10	250.00
4	Strengthening of RM	Nos.	50	All Blocks	0	0.00	4	200.00	0	0.00	0	0.00	0	0.00	4	200.00
5	Transaction Shed	Nos.	5	B1	0	0.00	0	0.00	0	0.00	1	5.00	0	0.00	1	5.00
6	Upgradation of Uzhavar Shadhais	Nos.	30	B1, B2	0	0.00	1	30.00	1	30.00	0	0.00	0	0.00	2	60.00
	Formation of FPO / Strengthening of Existing Commodity Groups															
7	FPO	Nos.	10	All Blocks	0	0.00	4	40.00	4	40.00	1	10.00	1	10.00	10	100.00
	Provision of Market Access and Market Activities															

Sl. No.	Intervention	Unit (Nos.)	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
8	Jam & Jelly making unit	Nos.	25	B2		0.00	1	25.00		0.00		0.00		0.00	1	25.00
9	Pack House for cut flowers	Nos.	25	B3		0.00	1	25.00		0.00		0.00		0.00	1	25.00
10	Potato harvester	Nos.	20	B1		0.00		0.00	1	20.00		0.00		0.00	1	20.00
11	Solar Dryer	Nos.	10	All Blocks	1	10.00	3	30.00	1	10.00	0	0.00	0	0.00	5	50.00
12	Essential Oil extraction units	Nos.	10	B1		0.00	1	10.00		0.00		0.00		0.00	1	10.00
13	Exposure Visits - within state	Nos.	1	All Blocks	1	1.00	4	4.00	4	4.00	4	4.00	1	1.00	14	14.00
14	Exposure Visits - outside state - 3 days	Nos.	3	All Blocks		0.00	2	6.00	3	9.00	3	9.00	0	0.00	8	24.00
15	Training on Market led Extension, Agmark grading&Food safety, post harvest technology, Supply Chain Management, Grading-sorting-packing, Market linkages & Exports, Food processing and value addition at district level	Nos.	0.5	All Blocks	8	4.00	8	4.00	8	4.00	8	4.00	8	4.00	40	20.00
	Grand total					**127.00**		**542.00**		**221.00**		**32.00**		**39.00**		**961.00**

B1-Udhagai, B2- Coonoor, B3-Kotagiri, B4-Gudalur

4.4 SEED CERTIFICATION AND ORGANIC CERTIFICATION

Seed is a critical input for long-term sustained growth of agriculture. Timely availability of certified quality seeds with good yield potential continues to be a decisive factor in agricultural production. Farmers in 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 laboratory facilities through supply of Conductivity meter Digital moisture meter
- Strengthening of communication and networking facilities through supply of computer accessories

Expected outcome

Enhancement of communication and networking would promote the quality of seed and organic certification.

Budget

The budget requirement for fulfilling those interventions is ₹ **5.00** Lakhs. The details of budget requirement for each intervention are shown in Table 4.4

Implementing agency

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

Table 4.4 Budget Requirement for Seed certification

(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
II	**Strengthening of communication and networking facilities**															
1.	Computer accessories	All Blocks	No's	0.5	10	5.00	0	0.00	0	0.00	0	0.00	0	0.00	10	5.00
	Total					**5.00**		**0.00**		**0.00**		**0.00**		**0.00**		**5.00**

B1- Udhagai, B2- Coonoor, B3- Gudalur, B4- Kotagiri

4.5 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:

- Increasing the availability of fodder through field level interventions in all blocks
- Increasing the availability of fodder by strengthening farm infrastructure in all blocks
- Livestock breeding management in all blocks
- Livestock health in all blocks
- Improving the livestock productivity in all blocks

- Improving the service delivery at veterinary institutions in all blocks
- Enhancing livestock management in all blocks
- Capacity building in all blocks

Increasing the availability of fodder through field level interventions

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

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

- Distribution of Azolla trays in all blocks
- Fodder plot development in all blocks

Increasing the availability of fodder by strengthening farm infrastructure

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

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

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

- Erection of Transformers in govt. farm in Udhagai block
- Establishment of farm production cover
- Construction of silo pit and overhead tanks in Udhagai block
- Establishment of feed mixing units in Udhagai block
- Installation of rain gun and sprinklers in Udhagai block
- Procurement of agri inputs and implements in Udhagai block

Livestock breeding management

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

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

Livestock industry continues to demonstrate a beneficial impact on rural people by improving their income, employment and consumption and thereby acting as a potential tool in alleviating rural poverty. Artificial insemination (AI) has proven to be very effective for the improvement of the genetic potential of animals for higher production and there is no

surprise why today AI is the back bone of all breeding programmes in India. The replacement of unproductive and ageing animals in the herd and its expansion are very important to maintain the scale of economy of the farm. Augmentation of fertility in repeat breeders and sex-sorted semen are some of the modern scientific tools which have been proposed to be employed for effective breeding management to enhance the livestock fertility and productivity. The following interventions will help to improve livestock breeding management, such as

- CIDR in Udhagai block
- Establishment and distribution of sex-sorted semen facility in Udhagai block
- Establishment of IVF lab in Udhagai block
- Establishment of LN2 and embryo transfer lab in Udhagai block
- Oestrous synchronization in Udhagai block

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

- Animal quarantine facility in govt. farm in Udhagai block

Improving the livestock productivity

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

- Distribution of sheep, goat, buffalo, piggery, poultry units in all blocks
- Establishment of modern poultry, rabbit , piggery, sheep, goat and bull shed in all blocks
- Integrated farming in all blocks
- Establishment of disposal pits in all blocks

Improving the service delivery at veterinary institutions

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

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

Enhancing livestock management

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

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

Capacity building

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

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

1. Establishment of farmers training Centre at Udhagamandalam block
2. Conducting demonstrations camps and campaigns in Gudalur block
3. Creating awareness of livestock management to the farmers through training programmes in Udhagamandalam block

Budget

The budget requirement for fulfilling the various above interventions is ₹ **4116.75** lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.5.

Implementing agency

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

Table 4.5 Budget requirement for Animal Husbandry

(₹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
	Increasing the Availability of Fodder through Field level Interventions															
1	Distrbution of Azolla trays	Nos	0.5	B2	2	1.00	0	0.00	0	0.00	0	0.00	0	0.00	2	1.00
2	Fodder plot development	acre	0.05	All blocks	400	20.00	400	20.00	400	20.00	200	10.00	200	10.00	1600	80.00
	Increasing the Availability of Fodder by Strengthening Farm Infrastructure															
3	Erection of Transformers to improve irrigation facility in Govt.farm	Nos	30	B4	0	0.00	1	30.00	0	0.00	0	0.00	0	0.00	1	30.00
4	Establishment of Farm Protection Cover (Bio-security wall)	km	5	B4	0	0.00	10	50.00	0	0.00	0	0.00	0	0.00	10	50.00
5	Establishment of Feed mixing/ feed block units	Nos	25	B4	0	0.00	1	25.00	0	0.00	0	0.00	0	0.00	1	25.00
6	Construction of silo Pit for livestock farm	Nos	1	B4	2	2.00	2	2.00	2	2.00	2	2.00	2	2.00	10	10.00
7	Construction of Over Head Tanks/ GLR / Pre-fabricated tanks in farm	Nos	20	B4	0	0.00	2	40.00	0	0.00	0	0.00	0	0.00	2	40.00
8	Drip irrigation for livestock farms	acre	0.6	B4	10	6.00	10	6.00	10	6.00	10	6.00	10	6.00	50	30.00
9	Borewell for livestock farms	Nos	8	B4	2	16.00	2	16.00	2	16.00	2	16.00	2	16.00	10	80.00
10	Installation of Raingun in Govt.farm in cultivated areas	acre	0.4	B4	5	2.00	5	2.00	5	2.00	5	2.00	5	2.00	25	10.00
11	Installation of Sprinkler system in fodder cultivated areas in Govt.farm	acre	0.4	B4	2	0.80	2	0.80	2	0.80	2	0.80	2	0.80	10	4.00

Sl. No.	Intervention	Unit	Unit cost	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
12	Procurement of Agri inputs for Farms	acre	0.15	B4	17	2.55	17	2.55	17	2.55	17	2.55	17	2.55	85	12.75
13	Procurement of Agricultural implements (tractor, trailers, harvesters, ploughs, chaff cutter, grass cutter etc)	Pack	50	B4	1	50.00	1	50.00	1	50.00	1	50.00	1	50.00	5	250.00
	Livestock Breeding Management															
14	Establishment of Infrastructure facilities for sex-sorting facility	Nos	300	B4	1	300.00	0	0.00	0	0.00	0	0.00	0	0.00	1	300.00
15	Induction of new Genetic Pool	Nos	3.5	B4	15	52.50	15	52.50	15	52.50	15	52.50	15	52.50	75	262.50
16	Establishment of IVF Lab	Nos	300	B4	0	0.00	1	300.00	0	0.00	0	0.00	0	0.00	1	300.00
17	Establishment of Liquid Nitrogen Plant	Nos	500	B4	1	500.00	1	500.00	0	0.00	0	0.00	0	0.00	2	1000.00
18	Establishment of Embryo Transfer Lab	Nos	100	B4	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	1	100.00
19	Establishment/ Strengthening of Semen Processing Lab	Nos	25	B4	1	25.00	1	25.00	1	25.00	1	25.00	1	25.00	5	125.00
	Livestock Health															
20	Animal Quarantine Facility in Govt.farm to prevent disease outbreak	Nos	50	B4	1	50.00	0	0.00	0	0.00	0	0.00	0	0.00	1	50.00
	Improving the Livestock Productivity															
21	Distibution of Sheep/Goat units -semi intensive system	Unit	0.6	All Blocks	15	9.00	15	9.00	15	9.00	15	9.00	15	9.00	75	45.00
22	Distribution of Buffalo units(5 Buffaloes)	Unit	4.5	All Blocks	5	22.50	5	22.50	5	22.50	5	22.50	5	22.50	25	112.50
23	Integrated farming (Goat+Cattle+Fish+Agriculture /Horticulture)	Unit	2	All Blocks	5	10.00	5	10.00	5	10.00	5	10.00	5	10.00	25	50.00

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
24	Development of Native chicken farms	Farm	1	All Blocks	25	25.00	25	25.00	25	25.00	25	25.00	25	25.00	125	125.00
25	Establishment of disposal pits for poultry unit	Nos	1	B1	1	1.00	0	0.00	0	0.00	0	0.00	0	0.00	1	1.00
26	Establishment of Modern Dairy/ Bull Shed	No	125	All blocks	1	125.00	0	0.00	0	0.00	1	125.00	0	0.00	2	250.00
	Improving the Service Delivery at Veterinary Institutions															
27	Deep freezer facility for Storage of vaccines and Medicines	Nos	10	All Blocks	0	0.00	0	0.00	4	40.00	0	0.00	0	0.00	4	40.00
28	Establishment of Mobile Disease Diagnostic Labs	No	20	B2	1	20.00	0	0.00	0	0.00	0	0.00	0	0.00	1	20.00
29	Establishment of Mobile Veterinary Units	Nos	10	B2, B3	2	20.00	0	0.00	0	0.00	0	0.00	0	0.00	2	20.00
30	Establishment of surgical theatres at veterinary institution	Nos	30	All Blocks	1	30.00	1	30.00	1	30.00	1	30.00	0	0.00	4	120.00
31	Package of Modern Veterinary Diagnostic Aids to Veterinary Institutions such as Computerised X rays, Ultrasound, Diathermy etc.	Nos	30	All Blocks	1	30.00	1	30.00	1	30.00	1	30.00	0	0.00	4	120.00
32	Establishment of Ambulance facility for animals	Nos	80	B4	1	80.00	1	80.00	0	0.00	0	0.00	0	0.00	2	160.00
	Livestock Management															
33	Animal Identification and Traceability	Unit of 1000 animals	0.1	All Blocks	300	30.00	30	3.00	30	3.00	30	3.00	30	3.00	420	42.00
34	Conservation of Indigenous breeds	Pack	10	All Blocks	1	10.00	1	10.00	1	10.00	1	10.00	1	10.00	5	50.00
	Capacity Building															

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
35	Establishment of Farmers training Centre	Nos	200	B4	0	0.00	1	200.00	0	0.00	0	0.00	0	0.00	1	200.00
36	Conducting Demonstrations, Camps and Campaigns	Nos	0.1	B2	1	0.10	1	0.10	1	0.10	1	0.10	1	0.10	5	0.50
37	Creating awarness of livestock management to the farmers through Training Programmes	Nos	0.1	B2	1	0.10	1	0.10	1	0.10	1	0.10	1	0.10	5	0.50
	Grand total					**1440.55**		**1641.55**		**356.55**		**431.55**		**246.55**		**4116.75**

B1- Coonoor, B2-Gudalur, B3-Kothagiri, B4-Ooty

4.6 DAIRY DEVELOPMENT

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

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

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

Strengthening of milk storages and processing units

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

The major interventions are,

1. Milk storage tanks of various capacities in all blocks
2. Milk tankers in all blocks
3. Milk pumps in all blocks
4. Processing equipment’s in all blocks

5. Pasteurizers in all blocks
6. Heaters and chillers in all blocks
7. Washer and conveyors in all blocks
8. Pipes and fittings in all blocks
9. Cleaning equipment's in all blocks
10. Electrical installations (UPS, generators, stabilizers, control panel) in all blocks

Enhancing milk production and milk processing units

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

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

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

Capacity building

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

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

Marketing structures

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

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

Quality control

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

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

Processing and value addition

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

1. Skim milk powder plant in all blocks
2. Dairy processing plants in all blocks
3. Water and effluent treatment plants in all blocks
4. Steam raisning plant in all blocks
5. Fat handling and other dairy equipment's in all blocks

Development for dairy sector

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

1. Construction of dairy farm and skim milk powder plant in all blocks

2. BMC building in all blocks
3. Cattle feed plants in all blocks
4. Ware house for dairy products in all blocks
5. Ice cream manufacturing buildings. in all blocks

Budget

The budget requirement for fulfilling the various above interventions is ₹ **4463.75** Lakhs. The details of budget requirement for each intervention across the blocks are shown in Table 4.6.

Implementing agency

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

Table 4.6 Budget Requirement for Dairy Development

(₹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
	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	0	0.00	4	100.00
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	20	5.00	20	5.00	20	5.00	20	5.00	20	5.00	100	25.00
5	SS pipes and fittings	All blocks	1	5	1	5.00	1	5.00	1	5.00	1	5.00	1	5.00	5	25.00
6	Solar system for water heating	All blocks	1	2	3	6.00	3	6.00	3	6.00	3	6.00	3	6.00	15	30.00
7	Packing Machineries for milk, Butter, Ghee, SMP and Other Milk products	All blocks	1	18	1	18.00	1	18.00	1	18.00	1	18.00	1	18.00	5	90.00
8	Plate Heat type Chillers and pasteurizers	All blocks	1	10	1	10.00	1	10.00	1	10.00	1	10.00	1	10.00	5	50.00
9	Milk Pumps of Vaious capacities	All blocks	1	0.5	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
10	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
11	Cleaning In Place equipments with	All blocks	1	75	0	0.00	0	0.00	1	75.00	0	0.00	0	0.00	1	75.00

Sl. No.	Intervention	Blocks covered	Unit	Unit cost	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
					Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	accessories															
	Procurement and Input															
12	Veterinary Medicine	All blocks	1	2	5	10.00	5	10.00	5	10.00	5	10.00	5	10.00	25	50.00
13	Two wheeler for AI technician	All blocks	1	0.5	10	5.00	10	5.00	10	5.00	10	5.00	10	5.00	50	25.00
14	Fodder seed materials	All blocks	1	0.25	10	2.50	10	2.50	10	2.50	10	2.50	10	2.50	50	12.50
15	Fodder development equipments like chaff cutter, Mower etc.,	All blocks	1	0.2	20	4.00	20	4.00	20	4.00	20	4.00	20	4.00	100	20.00
16	Bulk Milk coolers 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
17	Milk cans	All blocks	1	0.035	300	10.50	300	10.50	300	10.50	300	10.50	300	10.50	1500	52.50
18	Electronic weighing scales of various capacities.	All blocks	1	0.3	10	3.00	10	3.00	10	3.00	10	3.00	10	3.00	50	15.00
19	Electronic milk testing equipments	All blocks	1	1.25	10	12.50	10	12.50	10	12.50	10	12.50	10	12.50	50	62.50
20	Milking machine	All blocks	1	0.8	5	4.00	5	4.00	5	4.00	5	4.00	5	4.00	25	20.00
21	Cow shed	All blocks	1	5	10	50.00	10	50.00	10	50.00	10	50.00	10	50.00	50	250.00
22	Society Buildings	All blocks	1	20	5	100.00	5	100.00	5	100.00	5	100.00	5	100.00	25	500.00
23	Cryogenic containers	All blocks	1	0.35	15	5.25	15	5.25	15	5.25	15	5.25	15	5.25	75	26.25
24	Equipments for Artificial Insemination	All blocks	1	0.5	5	2.50	5	2.50	5	2.50	5	2.50	5	2.50	25	12.50
	Capacity building															

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
25	Training of personnel of MPCS, Union and Federation.	All blocks	1	0.05	200	10.00	200	10.00	200	10.00	200	10.00	200	10.00	1000	50.00
26	Infertility Camps	All blocks	1	0.2	100	20.00	100	20.00	100	20.00	100	20.00	100	20.00	500	100.00
	Marketing															
27	Parlour structures	All blocks	1	5	10	50.00	10	50.00	10	50.00	10	50.00	10	50.00	50	250.00
28	Milk product storage cabinets	All blocks	1	0.3	200	60.00	200	60.00	200	60.00	200	60.00	200	60.00	1000	300.00
29	Product Billing systems	All blocks	1	0.3	50	15.00	50	15.00	50	15.00	50	15.00	50	15.00	250	75.00
	Quality control															
30	Adulteration detection equipments	All blocks	1	4	1	4.00	1	4.00	1	4.00	1	4.00	1	4.00	5	20.00
31	Milk testing equipment and Laboratory.	All blocks	1	5	1	5.00	1	5.00	1	5.00	1	5.00	1	5.00	5	25.00
	Processing															
32	Refrigeration Plants	All blocks	1	500	0	0.00	0	0.00	1	500.00	0	0.00	0	0.00	1	500.00
33	Water Treatment Plants. Reverse Osmosis plant	All blocks	1	100	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00	1	100.00
34	Effluement treatment plant	All blocks	1	100	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00	1	100.00
35	Steam raisning plant with accessories	All blocks	1	100	0	0.00	0	0.00	1	100.00	0	0.00	0	0.00	1	100.00
36	Fat handling equipments	All blocks	1	200	0	0.00	0	0.00	1	200.00	0	0.00	0	0.00	1	200.00

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
37	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															
38	BMC buildings	All blocks	1	15	2	30.00	2	30.00	2	30.00	2	30.00	2	30.00	10	150.00
39	Ware house for Dairy products	All blocks	1	200	0	0.00	0	0.00	0	0.00	1	200.00	0	0.00	1	200.00
40	Ware house for Dairy consumables	All blocks	1	200	0	0.00	0	0.00	1	200.00	0	0.00	0	0.00	1	200.00
	Grand total					**614.75**		**594.75**		**1889.75**		**794.75**		**569.75**		**4463.75**

B1- Ooty, B2- Conoor, B3-Gudalur, B4- Kotagiri

4.7 FISHERIES

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

Indian fisheries and aquaculture is an important sector of food production, providing nutritional security to the food basket, contributing to the agricultural exports and engaging about fourteen million people in different activities. With diverse resources ranging from deep seas to lakes in the mountains and more than 10% 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.

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

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

The major interventions are

- Increasing Fishing Efficiency of Inland Fishermen and Fish Farmers in Gudalur block

- Exposure visits to farmers to other states in Gudalur block
- Training Programmes in Gudalur block

Overall budget

The budget requirement for fulfilling the above interventions is ₹ **5.75** lakhs

Implementing agency

Department of Fisheries will be implementing the project

Table 4.7 Budget Requirement for Fisheries

(₹ 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
	Enhancement of fisheries															
1	Increasing fishing efficiency of inland fishermen and fish farmers	Gudalur	1 unit	0.15	5	0.75	5	0.75	5	0.75	5	0.75	5	0.75	25	3.75
	Capacity building programme					0.00		0.00		0.00		0.00		0.00	0	0.00
2	Exposure visit to farmers to other states	Gudalur	1 unit	0.04	10	0.40	10	0.40	5	0.20	0	0.00	0	0.00	25	1.00
3	Training to fish farmers	Gudalur	1 unit	0.04	10	0.40	10	0.40	5	0.20	0	0.00	0	0.00	25	1.00
	Grand total					**1.55**		**1.55**		**1.15**		**0.75**		**0.75**		**5.75**

4.8 FISHERIES RESEARCH

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.

Project components

- Awareness campaign on health beneficial attributes of fish in Nilgiris
- Production of short films on nutritive value of fish and screening in theatres and television channels in Nilgiris
- supply of preserved ready to eat and ready to cook fish products through public distribution sytems in Nilgiris
- Supply of fish and fish products in mid-day meal programme in Nilgiris
- Supply chain management to promote consumption of farmed freshwater in Nilgiris
- Conservation of dwindling fisheries resource through native fish asylm in Nilgiris

Budget

The budget requirement for fulfilling the above interventions is ₹ **441.60** lakhs.

Implementing agency

Department of Fisheries will be implementing the project

Table 4.8 Budget Requirement for Fisheries Research

(₹ In lakhs)

Sl. No.	Interventions	Unit cost	Blocks Covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	**Aquaculture**														
e	**Enhancement of per capita consumption of fish**														
1	Awareness campaign on health beneficial attributes of fish	0.005	Nilgiris	52	0.26	52	0.26	52	0.26	52	0.26	52	0.26	260	1.30
2	Production of short films on nutritive value of fish and screening in theatres and television channels	50	Nilgiris	0	0.00	0	0.00	1	50.00	0	0.00	0	0.00	1	50.00
g	**Ensuring nutritional security through fish and fishery products**														
3	supply of preserved ready to eat and ready to cook fish products through public distribution sytems	12.9	Nilgiris	0	0.00	1	12.90	0	0.00	0	0.00	0	0.00	1	12.90
4	Supply of fish and fish products in mid day meal programme	12.9	Nilgiris	0	0.00	1	12.90	0	0.00	0	0.00	0	0.00	1	12.90
5	Supply chain management to promote consumption of farmed freshwater fishes	64.5	Nilgiris	0	0.00	1	64.50	0	0.00	0	0.00	0	0.00	1	64.50
3	**Fish resource management and conservation**														
e	Conservation of dwindling fisheries resource through native fish asylm	300	Nilgiris	0	0.00	0	0.00	0	0.00	1	300.00	0	0.00	1	300.00
	Grand total				**0.26**		**90.56**		**50.26**		**300.26**		**0.26**		**441.60**

4.9 PUBLIC WORKS DEPARTMENT

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

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

Project components

1. Construction of flood protection wall, check dam near Iduthatty Village, M. Palada Village in Coonoor Taluk, Pudiyangi Village, Masakkal Village in Kothagiri Taluk
2. Construction of foot Bridge across odai near Oyelatty village in Kothagiri taluk and Muttinaduhatti in Coonoor Taluk of Nilgiris district.
3. Lining and Improvements to Old Valaithottam supply channel in Masinagudi village of Ootytaluk, Puthurvayal channel of Gudalur Taluk, Manikallady Supply channel in Manikallady of Gudalur Taluk and Kallampalayam Village in Kothagiri taluk of the Nilgiris District.
4. Special repairs to check dam and supply channel in Chermulli village in Gudalur Taluk in Nilgiris district.

5. Construction of Foot bridge and retaining wall near H.A.D.P. Open air stadium across Kodappamund channel to go to Anna stadium in Ooty Taluk of Nilgiris District
6. Construction of Collapsed Right side wall in left side supply channel Ls 20 m to 50 m of Check dam near Housing unit of Coonoor Taluk in the Nilgiris District.
7. Construction of single lane bridge (road connecting) Naragiri and Beragani near Naragiri village of Kothagiri Taluk in Nilgiris District.

8. Lining and Improvements to supply channel in Kallampalayam Village in Kothagiri taluk of the Nilgiris District.

Budget

The budget requirement for fulfilling the above interventions is ₹ **813.00** lakhs

Expected outcome

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

Implementing agency

Department of Public Works will be implementing the project

Table 4.9 Budget Requirement for PWD (WRO)

(₹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 flood protection wall in left bank of D/S Surplus weir in Ooty taluk of Nilgiris district.	Ooty	No	18.00	1	18.00	0	0.00	0	0.00	0	0.00	0	0.00	1	18.00
2	Construction of checkdam near Iduthatty Village in Ooty taluk of the Nilgiris district.	Ooty	Ha	0.33	121	40.00	0	0.00	0	0.00	0	0.00	0	0.00	121	40.00
3	Construction of checkdam near M.palada Village in Coonoor taluk of the Nilgiris district.	Coonoor	Ha	0.58	121	70.00	0	0.00	0	0.00	0	0.00	0	0.00	121	70.00
4	Construction of foot Bridge across odai near Oyelatty village in kothagiri taluk in the Nilgiri district.	Coonoor	No	30.00	1	30.00	0	0.00	0	0.00	0	0.00	0	0.00	1	30.00
5	Construction of checkdam near Pudiyangi Village in Kothagiri taluk of the Nilgiris district.	Kotagiri	Ha	0.21	121	25.00	0	0.00	0	0.00	0	0.00	0	0.00	121	25.00
6	Construction of checkdam near Masakkal Village in Kothagiri taluk of the Nilgiris district.	Kotagiri	Ha	0.86	81	70.00	0	0.00	0	0.00	0	0.00	0	0.00	81	70.00
7	Lining and Improvements to Old	Kotagiri	Ha	0.14	364	50.00	0	0.00	0	0.00	0	0.00	0	0.00	364	50.00

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
	Valaithottam supply channel in masinagudi village of Ooty taluk.															
8	Construction of foot bridge across odai near Burial ground in Muttinadu hatti in Coonoor Taluk of Nilgiris District.	Coonoor	Ha	30.00	0	0.00	1	30.00	0	0.00	0	0.00	0	0.00	1	30.00
9	Construction of checkdam near ketty palada Village in Coonoor taluk of the Nilgiris district.	Coonoor	Ha	20.00	0	0.00	1	20.00	0	0.00	0	0.00	0	0.00	1	20.00
10	Lining and Improvements to Puthurvayal channel of Gudalur Taluk in Nilgiris District.	Kotagiri	Ha	0.56	0	0.00	0	0.00	445	250.00	0	0.00	0	0.00	445	250.00
11	Lining and Improvements to Manikallady Supply channel in Manikallady of Gudalur Taluk in Nilgiris District.	Gudalur	Ha	0.06	0	0.00	0	0.00	405	25.00	0	0.00	0	0.00	405	25.00
12	Special repairs to checkdam and supply channel in chermulli village in Gudalur taluk in Nilgiris district.	Gudalur	Ha	0.08	0	0.00	0	0.00	0	0.00	324	25.00	0	0.00	324	25.00

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
13	Construction of Foot bridge and retaining wall near H.A.D.P. Open air stadium across Kodappamund channel to go to Anna stadium in Ooty Taluk of Nilgiris District.	Ooty	Ha	20.00	0	0.00	0	0.00	0	0.00	0	0.00	1	20.00	1	20.00
14	Construction of Collapsed Right side wall in left side supply channel Ls 20 m to 50 m of Check dam near Housing unit of Coonoor Taluk in the The Nilgiris District.	Ooty	Ha	0.11	0	0.00	0	0.00	0	0.00	0	0.00	283	30.00	283	30.00
15	Construction of single lane bridge (road connecting) Naragiri and Beragani near Naragiri village of Kotagiri taluk in Nilgiris District.	Coonoor	Ha	0.49	0	0.00	0	0.00	0	0.00	0	0.00	81	40.00	81	40.00
16	Lining and Improvements to supply channel in Kallampalayam Village in Kothagiri taluk Of the Nilgiris District.	Kotagiri	Ha	0.58	0	0.00	0	0.00	0	0.00	0	0.00	121	70.00	121	70.00
	Grand total					**303.00**		**50.00**		**275.00**		**25.00**		**160.00**		**813.00**

4.10. Cooperatives

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

Major components

- Construction of Office Building in Conoor,Kotagiri and Udhagai block
- Renovation of Staff Quarters in Conoor,Kotagiri and Udhagai
- Construction of compound wall in all blocks in Conoor,Kotagiri and Udhagai
- Office Building Renovation in all the blocks
- Godown Renovation in all blocks
- Purchase of computer and peripherals in all blocks
- Construction of Community Hall in Conoor and Kotagiri block
- Renovation of Fair Price Shop in Conoor,Kotagiri and Udhagai
- Drying Yard in Kotagiri block

Budget

The budget requirement for fulfilling the above interventions is **₹ 6953.48 Lakhs**

Expected outcome

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

Implementing agency

Department of Cooperative Societies will be implementing the project.

Table 4.10 Budget Requirement for Civil supplies and Cooperatives

(₹ in Lakhs)

Sl. No.	Co-operation	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
			Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1	Construction of building for farmers input sales center	B1	1	72.96	0	0.00	0	0.00	0	0.00	0	0.00	1	72.96
2	Construction of Community Hall	B1 and B3	1	160.00	1	69.12	0	0.00	0	0.00	0	0.00	2	229.12
3	Construction of Compound wall	All Blocks	11	289.20	3	146.19	16	289.55	34	791.38	11	157.56	75	1673.88
4	Construction of Godown	B1, B4,B6	0	0.00	1	38.40	1	76.80	1	29.70	0	0.00	3	144.90
5	Construction of Office Building	B1, B3,B5	2	55.51	0	0.00	0	0.00	1	38.40	1	19.20	4	113.11
6	Construction of Road	B1,B3	16	98.62	1	21.50	0	0.00	0	0.00	0	0.00	17	120.12
7	Constuctuion of Drying Yard	B3	3	4.66	0	0.00	0	0.00	0	0.00	0	0.00	3	4.66
8	Renovation of Agricultural Inputs Testing Lab	B3	1	6.14	0	0.00	0	0.00	0	0.00	0	0.00	1	6.14
9	Renovation of Fair Price Shop	All Blocks	11	8.96	38	12.80	16	56.52	29	117.29	10	38.53	104	234.10
10	Renovation of Godown	All Blocks	36	326.52	1	5.12	11	56.26	22	162.01	8	37.25	78	587.16
11	Renovation of Office Building	All Blocks	100	138.69	32	66.17	83	262.12	181	677.96	69	218.31	465	1363.25
12	Renovation of Processing unit - Flour mill	B3	1	13.06	0	0.00	0	0.00	0	0.00	0	0.00	1	13.06
13	Renovation of Ryots Rest Hall	B1	1	22.53	0	0.00	0	0.00	0	0.00	0	0.00	1	22.53

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
14	Renovation of Staff Quarters	B1, B4,B6	1	97.92	2	3.84	0	0.00	1	2.56	0	0.00	4	104.32
15	Shopping complex Construction	B4	1	64.00	0	0.00	0	0.00	0	0.00	0	0.00	1	64.00
16	Strong Room construction	B2,B3	0	0.00	2	13.44	0	0.00	0	0.00	0	0.00	2	13.44
17	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	All Blocks	60	234.82	40	184.79	81	334.62	153	632.72	56	233.47	390	1620.42

Sl. No.	Co-operation	Blocks covered	2017-18		2018-19		2019-20		2020-21		2021-22		Total	
			Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
	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)													
18	Amenities for Cooperative Centres (RO Water unit, Sanitation, Vehicle Parking Shed, Construction and renovation of Marriage Hall, Construction and renovation of amenity centres)	All Blocks	23	509.41	4	48.83	3	3.20	4	3.84	1	1.03	35	566.31
	Total			**2103.00**		**610.20**		**1079.07**		**2455.86**		**705.35**		**6953.48**

Connor - B1, Gudalur - B2, Kothagiri - B3, Udhagai - B4

Table 4.11 Consolidated budget abstract for Nilgiris District

(₹. In lakhs)

Sl. No	Components	2017-18	2018-19	2019-20	2020-21	2021-22	Total
1	Agriculture	0.00	0.00	0.00	0.00	0.00	0.00
2	Agricultural Research (TNAU)	0.00	0.00	0.00	0.00	0.00	0.00
3	Horticulture	1928.98	1943.98	1943.98	1943.98	1943.98	9704.88
4	Agricultural Engineering	236.83	368.56	201.75	156.76	180.86	1144.74
5	Agricultural Marketing	127.00	542.00	221.00	32.00	39.00	961.00
6	Seed Certification & Organic Certification	5.00	0.00	0.00	0.00	0.00	5.00
7	Animal Husbandry	1440.55	1641.55	356.55	431.55	246.55	4116.75
8	Animal Science Research (TANUVAS)	0.00	0.00	0.00	0.00	0.00	0.00
9	Dariy Development	614.75	594.75	1889.75	794.75	569.75	4463.75
10	Fisheries	1.55	1.55	1.15	0.75	0.75	5.75
11	Fisheries Research (TNFU)	0.26	90.56	50.26	300.26	0.26	441.60
12	Water Resource Organization (PWD)	303.00	50.00	275.00	25.00	160.00	813.00
13	Civil Supplies & Co-Operation	2103.00	610.20	1079.07	2455.86	705.35	6953.48
	Grand total	**6760.92**	**5843.15**	**6018.51**	**6140.91**	**3846.50**	**28609.95**

The total budget requirement for implementation of various interventions by different departments in The Nilgiris district is **₹. 28609.95 lakhs.**


KARNATAKA
KERALA
SRI LANKA