DAIRY DEVELOPMENT DEPARTMENT

ANNUAL PLAN 2021-22

PRODUCTION AND CONSERVATION OF FODDER IN FARMER'S FIELDS AND DAIRY CO-OPERATIVES

(Head of Account: 2404-00-102-77)

PLAN OUTLAY: Rs. 760.00 LAKH

COMPONENT – FODDER DEVELOPMENT
(PLAN OUTLAY – Rs 760.00 LAKH)

01. INTRODUCTION

Agriculture is the primary source of livelihood for about 58% of India's population. Gross Value Added (GVA) by agriculture, forestry and fishing was estimated at Rs. 19.48 lakh Crore in the year 2021-22. Growth in GVA in agriculture and allied sectors stood at 4% in FY20. The Indian food industry is poised for huge growth, increasing its contribution to world food trade every year due to its immense potential for value addition, particularly within the food processing industry. Indian food and grocery market is the world's sixth largest, with retail contributing 70% of the sales. The Indian food processing industry accounts for 32% of the country's total food market, one of the largest industries in India and is ranked fifth in terms of production, consumption, export and expected growth. India is expected to achieve the ambitious goal of doubling farmers income by 2022. The agriculture sector in India is expected to generate better momentum in the next few years due to increased investment in agricultural infrastructure such as irrigation facilities, warehousing and cold storage.

Agriculture and allied sectors hold a significant position in any development process with its role in engaging and employing people, providing food and ensuring food security and raw materials. Agriculture is a pivotal sector for the economy to achieve the Sustainable Development Goals (SDG) of no poverty, zero hunger, and good health and well-being. With decline in the size of land holdings in agriculture, the State has to focus on production, productivity, and profitability to attain the SDG targets and sustainability in agriculture. Agricultural performance is subject to year to year fluctuations because of vagaries of nature as well as price volatility. The agricultural sector in Kerala has undergone significant structural changes in the form of decline in share of Gross State Domestic Product indicating a shift from the agrarian economy. The natural disaster that hit the State in the form of floods and landslide wreaked havoc, affecting agricultural sector the most. Crops were most heavily affected, contributing to 88 per cent of the total loss and damage to the sector. Kerala's growth rate in 2019-20 is lower than the rate in 2018-19. The lagged effects of 2018 and 2019 floods, recessionary national and international economy, onset of Covid-19 pandemic towards the end of last quarter of 2019-20 are the reasons for the slow growth. In fact, recessionary economic conditions at the national and international level were visible from 2019 onwards. This has been further aggravated by the Covid-19 pandemic. Though some signs of recovery are slowly discernable, State Governments have to face specific difficulties to recovery. Despite the low growth in 2019-20 and financial constraints, Kerala has made significant advancements in promoting growth of productive forces in the economy. The Government of Kerala has reinforced its thrust to support innovation, strengthen information technology and continued its commitment towards social welfare and protection and gender equality.

Share of agriculture and allied sectors in GVA/GSVA National and State level, at constant prices 2011-12, from 2013-14 to 2019-20, in per cent

Year	Share of agriculture and allied sectors in total GVA (India)	Share of agriculture and allied sectors in GSVA (Kerala)
2013-14	17.8	12.37
2014-15	16.5	11.92
2015-16	15.4	10.74
2016-17	15.2	9.96
2017-18	15.1	9.60
2018-19	14.6.	8.83(P)
2019-20	n.a	8.03(Q)

Economic Review - 2020

Animal Husbandry is a vital sector for ensuring a more inclusive and sustainable agriculture system and plays a pivotal role in the economic development of the country by enhancing farmers' income. It also provides gainful employment in the rural sector particularly among the landless farmers, small and marginal farmers, women, and weaker sections. It acts as both a supplementary and complementary enterprise.

Livestock sector plays a multi-faceted role in socio-economic development of rural households. Livestock rearing has significant positive impact on equity in terms of income and employment and poverty reduction in rural areas as distribution of livestock is more egalitarian as compared to land. In India, over 70 percent of the rural households own livestock and a majority of livestock owning households are small, marginal and landless households. Small animals like sheep, goats, pigs and poultry are largely kept by the land scarce poor households for commercial purposes due to their low initial investment and operational costs. In the recent decade, demand for various livestock based products has increased significantly due to increase in per capita income, urbanization, taste and preference and increased awareness about food nutrition. Livestock sector is likely to emerge as an engine for agricultural growth in the coming decades. It is also considered as a potential sector for export earnings.

In the national perspective, the livestock sector contributes 16 per cent of the income of small farm households as against an average of 14 per cent for all rural households and provides livelihood to two-third of the rural community. It also provides employment to about 8.8 per cent of the population in India and percentage of area used for all types of livestock farming was 1.69 per cent. Our country has vast livestock resources and contributes 4.11 per cent of GDP and 25.6 per cent of total agricultural GDP. *(Economic Review : 2020).* The rural women play a significant role in animal rearing and are involved in operations namely, feeding, breeding, management, and health care. The livestock sector has emerged as one which generates employment and income security to women through micro enterprises. Women constitute 71 per cent of the labour force in livestock farming. In dairying, 75 million women are engaged as against 15 million men, while in the case of

small ruminants, the sharing of work with men is almost equal. The need for technology upgradation, skill enhancement through capacity building programmes is felt across the sector.

As per **20th Livestock Census (2019),** the total livestock population of the country is 535.78 million showing an increase of 4.6 per cent over Livestock Census 2012. It includes 302.79 million bovine population (which includes cattle, buffalo, mithun, and yak) which recorded an increase of 0.93 per cent over the previous census. The total number of cattle in the country is 192.49 million showing an increase of 0.8 per cent over the previous census.

Livestock and Poultry Population in India, in lakh

Sl. No.	Species	17th Livestock Census 2003	18th Livestock Census 2007	19th Livestock Census 2012	20th Livestock Census 2019	Growth Rate 2012-19
1	Cattle	185.2	199.1	190.9	192.49	0.83
2	Buffalo	97.9	105.3	108.7	109.85	1.0
3	Yaks	0.1	0.1	0.1	0.058	-24.67
4	Mithuns	0.3	0.3	0.3	0.39	30
	Total Bovines	**283.4**	**304.8**	**300.0**	**302.79**	**0.92**
5	Sheep	61.5	71.6	65.07	74.26	14.12
6	Goat	124.4	140.5	135.2	148.88	10.12
7	Pigs	13.5	11.1	10.3	9.06	-12.04
8	Other animals	2.2	1.7	1.48	0.79	-46.62
	Total Livestock	**485**	**529.7**	**512.05**	**535.78**	**4.63**
9	Poultry	489	648.8	729.2	851.81	16.81

Source: Annual Report 2018-19, Department of Animal Husbandry, Dairying and Fisheries, GoI, 20th Livestock Census (2019)

In **Kerala, the livestock sector** is prominent and one of the fastest growing sectors of the rural economy. The share of livestock in Gross State Value Added (GSVA) at constant prices from the agriculture sector shows a marginal decrease from 26.97 per cent in 2018-19 to 26.67 per cent in 2019-20. Though GSVA at constant prices from the sector has increased in absolute numbers, its share in total GSVA of the State has declined marginally from 2.38 per cent in 2018-19 to 2.14 per cent in 2019-20.

As per **20th Livestock Census (2019**), the livestock population in the State was 38.36 lakh. Details of species-wise livestock and poultry population in Kerala is as below

Livestock and poultry population in Kerala, in lakh population

Species	2012	2019	Percentage variation from 2012 to 2019
Cattle	13.28	13.42	1.02
Buffalo	1.02	1.01	-0.71
Sheep	0.01	0.01	0
Goat	12.46	13.59	9.07
Other animals	12.11	10.33	-14.69
Total Livestock	**38.88**	**38.36**	**-1.34**
Poultry	238.45	298.18	25.05
Total	**277.34**	**336.54**	**21.35**

Source : Livestock Census : 2019

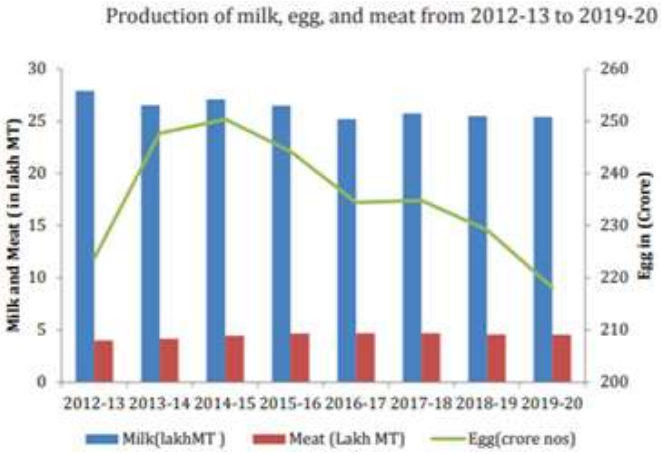
In Kerala, two-third of dairy animals are available in 7 districts of Palakkad, Thrissur, Ernakulam, Kozhikode, Kollam, Thiruvananthapuram and Kannur *(Source : Dairying in Kerala – A Statistical Profile – NDDB).*

The district wise cattle / buffalo population as per latest census report is as below

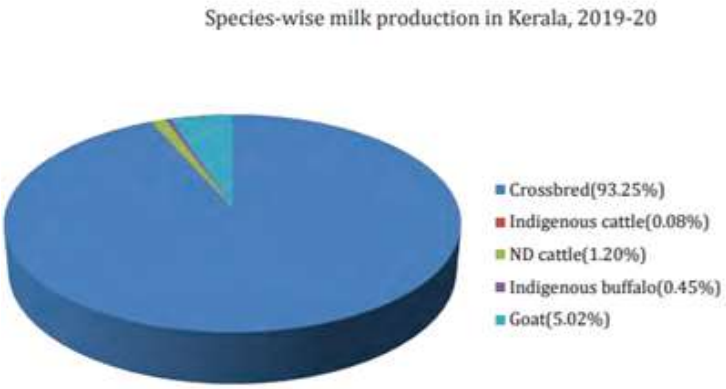
District Wise Population Live Stock Census 2019		
District	**Cattle (No.)**	**Buffalo (No.)**
Alappuzha	79370	5726
Ernakulam	108061	10029
Idukki	97395	5067
Kannur	91687	2446
Kasaragod	73968	1506
Kollam	110542	8658
Kottayam	81074	6163
Kozhikode	94248	3915
Malappuram	87035	15077
Palakkad	166952	9743
Pathanamthitta	61157	3260
Thiruvananthapuram	98822	5041
Thrissur	111932	20520
Wayanad	79753	4353
Grand Total	**1341996**	**101504**

Source : Livestock Census Report : 2019

Milk Production - India continued to be the largest milk producing country in the world. At the national level, the milk production has increased from 17.63 crore tonnes in 2017-18 to 18.77 crore tonnes in 2018-19 registering a growth of 6.5 per cent, sustaining the trend over the past three decades. The per capita availability of milk has been increasing in India over the years and increased to 394 gram in 2018-19. The highest per capita availability is in Punjab (1181 gram per day) followed by Haryana (1087 gram per day). The highest producer of milk is Uttar Pradesh with 16.3 per cent of total milk production in the country, followed by Rajasthan (12.6 per cent). The species-wise milk production shows that nearly 35 per cent of total milk production is contributed by indigenous buffaloes followed by 26 per cent by cross-bred cattle. The indigenous cattle contribute 11 per cent of the total milk production. Goat milk shares a contribution of 3 per cent in the total milk production across the country. The total requirement of milk in Kerala in 2019-20 was 33.22 lakh MT, but the supply was only 25.42 lakh MT resulting in a deficiency of 4.65 lakh MT milk. This necessitated an import of 3.15 lakh MT. Out of 25.42 lakh MT of milk produced in the State, major share was produced by cross bred cows (93.25 per cent). *[Source : Economic Review : 2020]*



Indigenous cows produced only 1,949 lakh MT of milk (0.08 per cent). The production of milk from goat was 1.28 lakh MT (5.02 per cent). The rest was contributed by non-descript cattle, indigenous buffalo and non-descript buffalo. Details of species-wise milk production in Kerala in 2019-20 is provided in as below



Source : Economic Review 2020

The natural calamities of 2018 and 2019 by way of hurricane floods and now the impacts of Covid 19 pandemic have all had a very negative impact on the stability of dairy sector of the state. The state is striving hard to overcome the disastrous situation and regain the lost glory which the state gained during the period from 2016-17 onwards. In spite of the adversities like flood calamities of 2018, 2019 and the prevailing Covid 19 pandemic impacts, it's a sign of relief that the productivity of milch cattle in Kerala is high as a result of an effective cross breeding policy in the state. 94% of cattle population is crossbreds with an average milk production of 10.22 litre per day which is second best to Punjab in the country. Economic Review 2020 reports reveal that the milk production during the year 2019-20 is 25.42 LMT.

5.94 Lakh Metric Tons of milk (16.27 lakh litre per day) was procured through Dairy Co-operatives during the year 2016-17, whereas 6.79 Lakh Metric Tons of

milk (18.61 lakh litre per day) is the corresponding figure for the year 2019-20. At the same time the milk procurement through Dairy Co-operatives of the state have marked a record figure during the year 2020-21. For the first time ever in the history of the state, the per day milk procurement through Dairy Co-operatives crossed 20 lakh litre per day during the month of Oct, 2020. During the month of Dec, 2020, the per day procurement reached an all-time high figure of 21.33 lakh litre per day. During the year 2020-21, the average milk procurement of milk through Dairy Co-operatives is around 19.32 lakh litre per day. This hike is a positive indicator as far as the Animal Husbandry and Dairy Development activities of the state is concerned and is a narration of the various development activities undertaken by the Government to nurture the Sector.

Fodder Production and Its Significance - Kerala produces only 60% of the roughages required for cattle in Kerala. One of the main constraints for increasing milk production is the shortage of quality fodder. Marginal and small farmers who are the major cattle owners of the state have limited space for fodder development. Whatever space available, the whole of which is mostly devoted to producing cash crops. Since fodder is not directly yielding any benefit, fodder cultivation takes a back seat. Such dairy farmers anyway need fodder to reduce their cost of production and thus would be eager to purchase fodder if readily available. Cows of Kerala are one of the high yielding animals of India. Lack of fodder and high cost of cattle feed leads to underfeeding of these animals resulting in suboptimal production of milk. Necessary steps needs to be taken for improving the fodder availability in the state and ensuring optimal feeding of these animals so that we can increase the productivity of these animals to their optimum potential.

The present cost of milk production is mainly driven by the cost of concentrates and external inputs for productivity. The farmer's expenditure on feeding of the productive animal is influenced by the difference of the selling price of milk with the cost of concentrate feed. This compels the farmers to adopt under feeding practices which lead to malnutrition resulting in a longer inter-calving period and reduction in the production potential of the crossbred animals.

A cost effective feeding practices for productive crossbred animal can be achieved by decreasing the dependence on external input i e., concentrates and increasing the internal input system through fodder production at farmer's level for nutrient availability & its balancing for optimum productivity by assisting farmers in adopting fodder cultivation in their own lands. This envisages focused attention on the special need to develop feed resources by improving availability of green fodder.

The project is intended to ensure the availability of fodder in farmer's field where the available land is utilized by adopting integrated cropping pattern. The cultivation can be pure crop or inter crop.

In the current scenario, where competing demands on land renders even expansion of food/cash crops a difficult proposition, the probability of increasing area under fodder crops is very difficult. It is therefore imminent to adopt a multi-pronged strategy for adequate availability of fodder in order to provide a

buffer to the farmer even in times of climatic variability. This strategy envisages supply of quality seeds, promoting production of fodder crops, extending fodder cultivation to currently fallow and unutilized lands, promotion of dual purpose varieties of crops which has the potential of meeting fodder requirements in season and off-season, promotion of non-traditional fodder, post-harvest technologies for preservation of fodder etc.

Besides, improving productivity in areas already under fodder cultivation, improving productivity of grazing and pasture lands, raising perennial fodder crops on field bunds and boundaries, peri-urban areas and exploiting unutilized and under-utilized fodder crops are also some of the promising options to enhance fodder availability. Plant Breeders in India have also identified a number of varieties/hybrids which could give a better quality and higher yield of crop residue without any compromise in grain yield.

Mechanization in the field of fodder development is a need of the hour. Farm mechanization has been helpful to bring about a significant improvement in agricultural productivity. Thus, there is strong need for mechanization of agricultural operations. The factors that justify the strengthening of farm mechanization in the country can be numerous. The timeliness of operations has assumed greater significance in obtaining optimal yields from different crops, which has been possible by way of mechanization. As production increases with mechanization of the farm operations, it creates a good scope for commercialization of fodder cultivation. Normally, there are good chances to reduce the cost of production if farm operations are mechanized as it saves labour, both human and bullock. In the absence of mechanization, the ever-increasing wage rate of human labour and cost of upkeep of draught animals will increase the cost of production much higher. Further, large scale production means less per unit cost on the farms. Farm machines have not only increased the mechanical advantage, but also helped to reduce drudgery while performing the different agricultural operations. The contributions of agricultural mechanization in various stages of crop production could be viewed as saving in seeds, saving in fertilizers, saving in time, reduction in labour, increasing in cropping intensity and higher productivity.

For the year 2021-22, as per the Kerala State Budget Provisions, it has been proposed to undertake fodder development activities for **Rs 760 lakh** in the state. The Department intends to take up Novel Fodder Development Plan and activities in the state. During 2021-22, under the Fodder Development Programme itself it is envisaged to cultivate perennial fodder in 2395 Ha of land.

02. OBJECTIVES

- To cultivate perennial green fodder (CO-3/CO-4/CO-5) crops in **2395 Ha** of land.
- To introduce new scientific low cost feeding culture among Dairy farmers.
- To uplift the sustainability and reliability in dairying by reducing the feeding cost by 30%
- Providing irrigation assistance and mechanization of fodder cultivation activities.
- To improve the general health of the milch animal and the quality of milk produced.
- To ensure the availability of green fodder throughout the season by assisting the farmers by providing planting materials and cultivation assistance.
- To ensure fodder and planting materials availability in the area.
- To generate employment and income to the producers by sale of fodder.
- To enhance the capacity of farmers for adoption of fodder production technology through field level training and demonstrations.
- To encourage Massive/Comprehensive Fodder Cultivation Programme in Barren / Unutilized land in selected zones covering 85 Ha of Land.
- To provide irrigation assistance and assistance for mechanization activities
- To establish 07 number of DCS based SHG/Women Groups/Other recognized Groups for fodder production and marketing.
- To assist farmers for undertaking Hi-Tech Fodder Development Programme like Hydroponic Fodder Production Units (suitable for 2 cows to 8 cows)

03. FINANCIAL OUTLAY

PRODUCTION AND CONSERVATION OF FODDER IN FARMERS FIELDS AND DAIRY CO-OPERATIVES : 2021-22 (2404-00-102-77)							
SL NO.	**SCHEME COMPONENTS**	**UNITS**	**2021-22**				
			NO OF UNITS	**UNIT COST (Rs)**	**UNIT SUBSIDY (Rs)**	**TOTAL COST (Lakhs)**	**TOTAL SUBSIDY (Lakhs)**
COMPONENTS UNDER 2404-00-102-77-34 - OC-3 OTHER ITEMS							
1	**Fodder cultivation - 20 cents & above (Ha)**	Ha	2200	60500	21500	1331.000	**473.000**
2	**Transportation cost**	Number	14	Lumpsum		2.611	**2.611**
3	**Fodder seminar & Fodder day celebration at the District level & State Level**	Number	15	500000	500000	5.000	**5.000**
4	**Dairy Promoters incentive (Incentive @ Rs 7500 /month per Dairy Promoter for 8 months)**	Number	162	60000	60000	97.200	**97.200**
5	**Irrigation Assistance**	Number	50	20000	10000	10.000	**5.000**
6	**Irrigation Assistance for Fodder Plots above 1 acre**	Number	28	50000	25000	14.000	**7.000**
7	**Mechanization& Modernization of fodder cultivation**	Number	50	20000	10000	10.000	**5.000**
8	**Scheme for Maize cultivation**	Ha	110	15330	15330	16.863	**16.863**
9	**Pilot Scheme for Comprehensive and Massive Fodder Cultivation in Barren and Unutilised lands of selected Panchayats**	Ha	84	155120	93007	130.301	**78.126**
10	**Assistance for Fodder cultivation and marketing by SHG / DCS / Women Groups**	Number	7	100000	75000	7.000	**5.250**
11	**Assistance for Compact / Mini / Low Cost Hydroponic Fodder Cultivaton**	Number	23	Lumpsum		41.692	**24.950**
12	**Assistance to State Fodder Farm, Valiyathura, Tvm**	Number	1	1000000	1000000	10.000	**10.000**
SUB TOTAL : 2404-00-102-77-34-OC-3 OTHER ITEMS						**1675.667**	**730.000**
13	**2404-00-102-77-04 TE (1) TOUR TA**	Number	15	Lump sum	Lump sum	**15.00**	**15.00**
14	**2404-00-102-77-05 OE-4 OTHER ITEMS**	Number	15	Lump sum	Lump sum	**10.00**	**5.00**
15	**2404-00-102-77-45-POL**	Number	15	Lump sum	Lump sum	**5.00**	**10.00**
GRAND TOTAL : 2404-00-102-77						**1705.667**	**760.000**

Savings in any one Scheme Component shall be utilized for meeting the expenditure pertaining to any other Scheme Component defined in this Scheme

04. SCHEME PROPER

04.01 PERENNIAL FODDER CULTIVATION – 20 CENTS AND ABOVE
(Plan Assistance – Rs 473.00 lakh)

The Scheme envisages assisting cultivation of perennial fodder in a total area of 2200 Ha of land providing planting material free of cost and assistance for cultivation to farmers. Application for assistance under the scheme will be invited from the dairy farmers for cultivation of fodder in suitable land with perennial irrigation source by the Dairy Extension Officer concerned. Necessary awareness in the proposed programme will be given through Dairy Extension Service Unit, Dairy Co-operative Societies, Local Self Government Institutions, All India Radio, Farm Information Bureau and local dailies. The farmers rearing animals and willing to spare land or arrange land on lease for fodder production will be selected for the programme. The minimum area of cultivation for which assistance given will be limited to 20 cents and multiple of 10 cents. ***Each district will have to select mandatory beneficiaries under the category a. Plots with minimum 50 cents and b. Plots with minimum 100 cents.*** There will be no upper limitation of area for availing assistance and the beneficiaries will be eligible for assistance by covering at least an area of 20 cents. The selected beneficiary will have to register their name at the Dairy Extension Service Unit of the concerned block by paying registration fees of Rs.11/- per cent of land. The sanctioning authority will be the District Officer. The registration fees collected will be remitted by the Dairy Extension Officer in the Treasury.

The cultivation will be done by using stem cuttings/rooted slips of Hybrid Napier (CO-3 / CO-4 / CO-5) which will be made available to the farmers free of cost. The distribution of slips and seeds to the selected/ registered beneficiaries will be ensured by the Deputy Director of the concerned districts from the Government farms, approved fodder nurseries maintained by the Dairy Co-operative Societies/ NGO's /Individuals approved by the Director based on recommendation of the Deputy Director.

In order to get maximum growth and production, the requirement of stem cuttings per hectare of land is estimated as 15000.The subsidy given to the beneficiaries for cultivation of fodder under the scheme will be Rs. 12,500/ Hectare of land in addition to the root slips supplied free of cost . Value of root slips supplied /hectre of land is estimated to be Rs. 9,000/- . Therefore the total subsidy for cultivating fodder in one hectare of land comes to Rs 21,500/-.

Unit Cost (for 1 Ha fodder cultivation)

SI.NO	PARTICULARS	AMOUNT (in Rs)
1	Cost of slips (15000 /Ha) 15000 X 0.60 Ps/slips	9,000
2	Land preparation - 25 man days X Rs.500 /man day	12,500
3	Basal Manuring	16,500
4	Planting - 20 man days X Rs.500 /man day	10,000

5	Weeding/irrigation - 10 man days X Rs.500 /man day	5,000
6	Top dressing	6,000
7	Miscelleneous Expenses	1,500
Total Cost per Ha		**60,500**
Subsidy @ Rs 21,500/ Ha		
(Cultivation assistance @ Rs 50/- cent & slip cost @ Rs 0.60 Ps / slip); Slips are distributed free of cost.		

Financial Outlay

Area (in Ha)	**Subsidy per Ha (Rs.)**	**Total Plan Assistance (Rs. in Lakhs)**
2200	**21500**	**473.00**

The mandatory fodder plots with minimum area of cultivation (50 cents and 100 cents), that are to be cultivated and maintained at each district is as below.

SI.NO	**DISTRICT**	**TARGET -NO. OF FOODER PLOTS**	
		Min 50 Cents	**Min 100 Cents**
1	Thiruvananathapuram	10	5
2	Kollam	8	4
3	Pathanamthitta	6	3
4	Alappuzha	10	5
5	Kottayam	10	5
6	Idukki	10	5
7	Ernakulam	10	5
8	Thrissur	15	7
9	Palakkad	15	7
10	Malappuram	6	4
11	Kozhikode	10	5
12	Wayanad	8	4
13	Kannur	8	4
14	Kasargod	6	4

04.02 TRANSPORTATION COST (Plan Assistance – Rs 2.611 Lakh

An amount of Rs**. 2.611 Lakh** has been kept apart to meet the transportation cost of fodder , planting materials and seeds within the district / interdistrict.

04.03. FODDER SEMINAR & 'FODDER DAY' CELEBRATIONS (Plan Assistance – Rs 5.00 lakh)

It is proposed to conduct district level Fodder Seminar in all the 14 districts along with the celebration of 'Fodder Day' on a predetermined date involving the farmers, officials of the various departments, dairy co operatives, representatives of the dairy industry and experts / scientists from universities etc. Discussions on topics of relevance to the current situation in the field of fodder production will be made. Exhibits of relevance to fodder production will be displayed in the event. Short duration fodder crop seeds like maize, jower, cowpea, fodder trees etc will be distributed to farmers on the 'Fodder day' celebration in each district. Best sustaining farmers in fodder cultivation will be honored during the function. A sum of Rs. 5.00 Lakh is provided for the 'Fodder day' celebrations in State level and district level with fodder exhibitions.

Plan Assistance – Rs 5.00 Lakh

04.04. DAIRY PROMOTER'S INCENTIVE (Plan Assistance – Rs 97.200 Lakh)

To familiarize the cultivation of green fodder, commercial fodder production, cultivation of fodder in cultivable waste land under irrigated condition, to get maximum yield by doing timely operations, dairy farmers need constant timely interaction and persuasion to establish the crop, in addition to the available amenities. Hence it is proposed to utilize the service of trained matriculate in the field, one in each block on incentive basis, designated as **Dairy Promoters**. The incentives will be paid at a rate of **Rs. 7500/ month**. They will be given 2 days training on fodder development activities which is required for field and they shall be engaged for 8 months.

Rs. 7500 x 8 months x 162 blocks = Rs. 97.200 Lakh

04.05 IRRIGATION ASSISTANCE (Plan outlay – Rs 5.00 lakh)

This Scheme envisages providing irrigation assistance for existing fodder plots having source of irrigation. Pump sets, storage tanks, connecting hose, sprinkler system, drip system etc. can be established under this scheme. Assistance may be given for Rain water harvesting purpose also. Preference will be given to those beneficiaries having fodder plots with more than 50 cents area.

Subsidy component will be limited to 50 % of the total cost or a maximum of Rs. 10,000/- to each unit.

FINANCIAL OUTLAY

FINANCIAL OUTLAY - IRRIGATION ASSISTANCE						
TOTAL UNITS	UNIT COST			COST FOR TOTAL UNITS		
	TOTAL	SUBSIDY	BENEF. CONT	TOTAL COST	SUBSIDY	BEN. CONTR
	Rs	Rs	Rs	Rs in Lakh	Rs in Lakh	Rs in Lakh
50	20000	10000	10000	10.00	5.00	5.00

04.06 IRRIGATION ASSISTANCE FOR FODDER PLOTS ABOVE 1 ACRE
(Plan Outlay – Rs 7.000 lakh)

This Scheme component envisages providing irrigation assistance for existing fodder plots having source of irrigation. Pump sets, storage tanks, connecting hose, sprinkler system, drip system etc. can be established under this scheme. Assistance may be given for rain water harvesting purpose also. Beneficiaries shall be farmers who cultivate fodder for more than 1 acre. The scheme component shall be implemented with linkage through Dairy Co-operative.

Subsidy component will be limited to 50 % of the total cost or a maximum of Rs. 25,000/- to each unit.

04.06.01 FINANCIAL OUTLAY

FINANCIAL OUTLAY - IRRIGATION ASSISTANCE FOR FODDER PLOTS ABOVE 1 ACRE						
TOTAL UNITS	UNIT COST			COST FOR TOTAL UNITS		
	TOTAL	SUBSIDY	BENEF. CONT	TOTAL COST	SUBSIDY	BEN. CONTR
	Rs	Rs	Rs	Rs in Lakh	Rs in Lakh	Rs in Lakh
28	50000	25000	25000	14.00	7.00	7.00

04.06.02 IMPLEMENTATION

Beneficiaries shall be elite and progressive farmers who cultivate fodder for more than 1 acre. For better accountability this scheme component shall be implemented with linkage through DCS. The applicant shall submit the duly filled application form through the DCS concerned. The Secretary of concerned DCS shall forward the application form of the beneficiary with relevant recommendations and copy of BOD resolution to the Dairy Extension Service Unit. Selected beneficiaries shall remit the beneficiary contribution (amount exceeding the subsidy component) to the DCS. A beneficiary committee comprising of Dairy Extension Officer (or Dairy Farm Instructor as deputed by DEO), The President of concerned DCS, The Secretary of the concerned DCS and selected beneficiary shall be responsible of purchase of the items. The DCS shall advance the amount incurred for purchase of equipments / implements. The DCS shall submit relevant documents regarding payment of beneficiary contribution, amount advanced by DCS for purchase of equipments and stock certificate. The Dairy Extension Officer after proper verifications from the office shall release the subsidy to the Dairy Co-operative Society. The beneficiary shall execute an agreement in stamp paper (valued as per existing government norms) that the assisted plot and implements purchased shall be maintained in good condition for a minimum period of 3 years. As there is no financial commitment from the part of the DCS, the ownership, maintenance and upkeep of the equipment / implements purchased shall be vested with the beneficiary
Registration Fees – Rs 170 / beneficiary

04.07 MECHANIZATION AND MODERNISATION OF FODDER CULTIVATION (Plan outlay – Rs 5.000 lakh)

The economic viability of a dairy unit largely depends on the availability of fodder grass. Better resource management and farm mechanization have led to an increase in the fodder yield, despite the challenges posed by adverse climate, soil and water salinity. Mechanization will encourage dairy farmers to take up fodder production on commercial basis. It includes providing machineries like tillers, harvester, chaff cutter, agricultural implements etc. This will help in reducing the labour cost and thereby make fodder cultivation economically viable occupation to those having sufficient land. Use of chaff cutters will prevent wastage of fodder and improve its intake and thus help in easy assimilation of the nutrients. The project envisages providing financial assistance for the purchase of machinery based on the requirement of the beneficiary. 50 % of the cost of the machinery or Rs 10000/- whichever is less will be provided as assistance. ***Registration Fees – Rs 170 per beneficiary***

Financial Outlay

FINANCIAL OUTLAY MECHANISATION AND MODERNISATION OF FODDER CULTIVATION						
TOTAL UNITS	UNIT COST			COST FOR TOTAL UNITS		
	TOTAL	SUBSIDY	BENEF. CONT	TOTAL	SUBSIDY	BENEF. CONT
	Rs	Rs	Rs	Rs in Lakh	Rs in Lakh	Rs in Lakh
50	20000	10000	10000	10.000	5.000	5.000

04.08 SCHEME FOR MAIZE CULTIVATION FOR GRAIN PRODUCTION (Plan Outlay – Rs 16.863 lakhs)

Introduction

Maize is one of the important coarse cereal crops grown in different agro-climatic conditions. It is being used for manufacturing lot of industrial products. In addition it is used as an important feed and fodder for animals. Maize is rich source of starch, proteins, fat and minerals. Maize is a major component of cattle feed mixture providing the much needed carbohydrate in the animal ration. At present the feed companies like Kerala Feeds, Milma feeds and feed factories run by Dairy co-operatives are procuring Maize from Northern States incurring heavy expenditure. Quite often they face difficulties in procuring Maize due to seasonal fluctuation and non-availability. If Maize is cultivated in the state on a large scale the seeds can be made available to Kerala Feeds/Milma feeds/Dairy co-operatives on a buy back arrangement and the Stover (crop residue) can be fed to cattle as dry roughage.

The Scheme

The scheme envisages cultivating Maize as a pure crop by selected farmers who have sufficient land / are willing to cultivate in leased land. The minimum area to be cultivated is 25 cents. The scheme will be implemented in those districts which have proximity to the Feed factories and have the suitable Agro-climatic conditions favoring maize cultivation.

The beneficiary selection may be done at the district level. Priority should be given to the land near the Feed Factories. Application for the scheme will be invited by the Dairy Extension Officer concerned. On receipt of application the implementing officer and subordinates should verify the applications and the sanctioning authority will be the District officer. The selected beneficiary will sign an agreement that they will give the maize seed produced to the Feed factories on the rate fixed by the Board of Feed factories. In the event of the price of Maize grains provided by Feed factories is lower or Feed factories are not in a position to collect the Maize grains , the farmer will be free to sell it as directed by the Dairy Development Department . Since Maize is not commonly cultivated for grain purpose in Kerala, the selected beneficiaries will be given training on package practices of Maize crop for grain production. Also the implementing officers will be given a chance to visit the fodder farms in other states, mainly Maize grown for grain purposes.

Individuals /SHG's/DCS/NGOs can be provided assistance under the scheme. The Stover can be utilized by the beneficiary himself for feeding his cattle or can be sold to other farmers through the DCS on mutually agreed price.

Financial outlay

Component	**Area**	**Unit Seed rate**	**Seed Cost per Kg**	**Total Plan Outlay**
	Ha	Kg	Rs./Kg	Rs.
Maize Seed	110	40	69	3,03,600.00
Assistance to farmer per Ha @ Rs.12570/Ha	110			13,82,700.00
Grand Total				**16,86,300.00**

To get the maximum yield of maize, farmers will be given seeds by the Department from the certified agencies. In order to get maximum growth and production, the requirement of seed per hectare of land is estimated as 40 Kg . The assistance given to the beneficiaries for cultivation of Maize in one Ha of land will be Rs.12570 in addition to the seeds supplied free of cost. Value of

seeds supplied /hectare of land is estimated to be Rs. 2760/- (40 Kg x Rs.69 /Kg of seed, the rate per kg seeds may change).

Therefore the total assistance for cultivating Maize in one hectare of land comes to Rs 15,330/-.

Financial outlay in Maize production (Rs./Ha)

SI.NO	PARTICULARS	AMOUNT	SUBSIDY (Rs)
1	Cost of seeds (@40 Kg /Ha) X Rs.69/Kg)	2760.00	2,760.00
2	Cultivation expenses such as Land preparation , basal manuring, fertilizers, planting , weeding pest control, irrigation, pesticides, top dressing, harvesting, rent for crusher, cost for drying the seed etc. Plus Implementation Charges	43,250.00	12,570.00
Total Assistance per Ha			**15,330.00**

The average yield per Ha of Maize is 2.3 tons of grains. In Kerala condition the yield may be slightly lesser and we may assume it to be 2 tones/Ha, which will result in 220 tones of seed which can be procured by feed factories. The seeds produced will be procured by Feed factories at a price fixed by the Board of the Feed factories.

The crop residue (Stover) can be sold to other farmers through the Dairy Co-operatives as dry roughage for which there is high demand and will be remunerative for the farmer cultivating maize.

A portion of maize cultivation 2021-22 (for seed purpose) can also be utilized as base seed for hydroponic units which have been assisted by Dairy Development Department and also for hydroponic units which are selected during the year 2021-22

Monitoring :

The District Deputy Director under the guidelines issued then and there will monitor the implementation.

Conclusion :

The scheme will help in addressing the shortage of dry matter required for cattle in the State as well as provide some quantity of raw material for feed manufacturing within the state itself.

If any savings is available in any component of the schemes, that amount will be utilized for purchase of seasonal fodder.

04.09 COMPREHENSIVE AND MASSIVE FODDER CULTIVATION IN BARREN AND UNUTILISED LANDS OF SELECTED AREAS (Plan Outlay – Rs 78.126 lakhs)

04.09.01 Fodder Requirement and Availability

Total Female Cattle population in Kerala is 14 lakhs. The annual Dry Matter requirement for maintaining our herd is about 84 lakh kg per day. The Dry Matter Requirement is estimated to be 84 lakh kg per day of which 56 lakh kg per day has to be met from roughages. Considering an average DM content of 20 percent in fodder, the green fodder requirement per day is 0.28 lakh tonne per day or 102.2 LMT per year. Kerala is only 46 % self-sufficient as far as green fodder availability is concerned (40 LMT availability as against the requirement of 87 LMT)

On account of the above the area to be made under fodder cultivation is around 64,000 Ha (Hybrid Napier) whereas the availability is only around 30,000 Ha.

04.09.02 Need for a pioneering fodder plan for the state.

The profitability of dairy farmers is deeply hindered by the high production cost. A limiting factor in this regard is high dependence on concentrate / compound feed due to non-availability of adequate fodder especially green grass. The farmers of Kerala are mainly marginal in nature. The limitation in land availability, availability of high yielding varieties of fodder, resistance of farmers to take up fodder development activities, inadequate mechanization activities, inadequate fodder marketing facilities, lack of proper facilities for fodder processing activities are some factors to be redressed for establishing a new fodder development culture in the state.

The fodder availability in the state is sufficient enough to meet on an average 36 % of the requirement. In order to narrow the gap, innovative and novel approaches has to be initiated. As a part of the same, intensive fodder cultivation activities has to be taken up by the department. Fodder cultivation has to be taken up in available barren lands that too in an intensive and aggressive manner. The project implemented during the year 2017-18 and 2018-19 for undertaking comprehensive fodder development in barren land was a huge success.

04.09.03 OBJECTIVE OF THE SCHEME.

The scheme is aimed at

01. Undertaking intensive fodder cultivation programme in selected zone of the state where barren / Unutilized land is available for fodder cultivation.

02. Ensuring fodder cultivation in **84** Ha of barren land available in the selected areas by integrating and ensuring the participation of Department, LSGD, Dairy Co-operative Societies, PSU's, progressive farmers etc.

03. Ensuring **14,000** MT of additional green fodder per annum.
04. Developing sustainable and model fodder development programme in selected areas. Integration of mechanization activities to be ensured
05. Narrowing the gap between fodder requirement and availability of the state
06. Developing sustainable, effective and profitable fodder cultivation models so as to encourage individuals, SHG, Govt agencies to take up fodder development activities
07. Utilizing cultivable forest lands for fodder cultivation

4.09.04 SCHEME PROPER

It is proposed that the comprehensive and massive fodder production scheme be implemented in selected areas of the state. The selected beneficiary (individuals / groups / DCS / NGO / Charitable organizations etc) will have to establish fodder cultivation in minimum 1 hectre of barren cultivable land under its geographical premises. Minimum unit plot size shall be 1 acre. There will not be any upper limit for unit plot size or number of units permissible for a particular beneficiary including individual / organization / institution.

Registration Fees – Rs 180 per beneficiary

The implementation of the scheme involves the following stages

1. **Ensuring state wide publicity for the project**
2. **Preliminary awareness programme for District Level Officers**
3. **Inviting applications**
4. **District Level Selection of beneficiary**

After getting the consent from the concerned beneficiary, the Dairy Extension Officers of each DESU shall submit an application in prescribed format with proper recommendations including consent of the concerned beneficiary / institution, board decisions of the selected DCS coming under the area of operation of the DESU to the concerned Deputy Director of the district. The Deputy Director shall scrutinize the applications received from various DESU coming under the district. The Deputy Director shall be assisted by the Assistant Directors of the district for selecting the organization / Institution from among the various applications. The Deputy Director shall be the authority responsible for final selection of beneficiary in a particular district. The district selection shall be based on the target allotted from the Directorate.

The following criteria shall be adhered to while ranking / selecting the beneficiary.

- *Availability of barren cultivable land in the selected area / Zone*
- *Priority of ownership of barren land in the order of Govt owned, PSU Owned, LSGD owned, Charitable organizations, progressive farmers, other individuals etc*

- *Availability of land on lease.*
- *Source and availability of water and electricity for irrigation purpose*
- *Availability and concurrence of a potential DCS coming under the DESU which is willing to take up the project.*

The present status of available fodder shall not be a criteria for selection of beneficiary rather the potential of the area and the gap in fodder and the possibilities to make use of the available barren land will be the criteria.

5. **Training programme for the representatives of selected beneficiary**
   Training for selected beneficiaries shall be carried out at district level. Training shall be arranged with the technical support from Dairy Training Centre of the Department
6. **Land preparation and other preliminary activities pertaining to selected beneficiary / beneficiary Institution / Organization.**
   Mechanized land preparation activities shall be followed (like use of Renovators, Ploughing machineries, weeding techniques etc)
7. **Mechanized Fodder Cultivation activities**
8. **Harvesting of fodder**
9. **Marketing of fodder (with linkage to DCS to the maximum extent possible)**
10. **Release of financial assistance to the beneficiary**
11. **Monitoring of the scheme**
12. **State wide documentation**

04.09.05 TECHNICAL AND FINANCIAL PARAMETERS / OUTLAY

Technical cum Financial Parameters

- Min unit / Plot Size – 1 acre
- Max permissible units - No limit
- Type of fodder to be cultivated - High yielding variety of Hybrid Napier
- Ploughing by cultivator – Rs 6000 per hectre
- Ploughing by Rotovator – 2 times for 1 acre (1 hour per acre) @ Rs 800/hr
  i.e Rs 4000/- per hectre

Fertilizer Application – Preliminary

- Basal dose manuring after initial ploughing by Rotovator
- Urea - 87.5 kg / ha
- Potash - 50 kg / ha
- Rock phosphate - 250 kg / ha
- Cow dung - 2000 kg / ha @ Rs 2.5 per kg

Fertilizer Application - After each cutting

- Urea application - 20 Kg / Ha
- Hand picking / clearing of land – 4 man days per ha

- Cost of fodder slip –15,000 / Ha @ Rs 0.60 per slip
- No. of slips required per Ha - 15,000 per Ha
- Planting Charges – 10 man days per Ha @ Rs 750 per man day
- Irrigation Charges - Rs 30,000 per Ha
- Top Dressing Charges – Rs 3000/Ha
- Harvesting Charges - Rs 5000/Ha
  (including loading and unloading of fodder to the vehicle)
- No. of cutting expected per year - 7
- Transportation Charges (Lumpsum) - Rs 20,000 per Ha
- Provisions for Cost Of Implements Weighing Machine and
  Other Unforeseen Expenditure - Rs 20,000 (Lumpsum)
- Selling price of fodder - Rs 2.5 per Kg

Note

If DCS is linked to this scheme, then the DCS can engage supervisory staff for the overall monitoring and implementation of the project (No plan fund will be provided for this). The Project may be loan linked if possible. DCS can avail eligible loan from banks

04.09.06 FINANCIAL OUTLAY

COST BREAK UP (1 HA)		
SI.NO	**PARTICULARS**	**TOTAL CHARGE PER ANNUM (Rs)**
1	**RENT FOR LEASE LAND**	8500
2	**LAND PREPARATION CHARGES** (PRELIMINARY PLOUGHING BY CULTIVATOR + PLOUGHING BY ROTOVATOR+AND PICKING / CLEARING OF LAND / INTERWEEDING)	12500
3	**COST OF SLIP**	9000
4	**FERTILIZER APPLICATION** (BASAL DOSE MANURING + MANURING AFTER EACH HARVESTING + TOP DRESSING)	12120
5	**LABOUR CHARGES** (PLANTING COST+HARVESTING CHARGES)	43000
6	**TRANSPORTATION CHARGES**	20000

7	**IRRIGATION CHARGES** (INCLUDING ELECTRICITY CHARGES) - CAPITAL + SPRINGLER AND ACCESSORIES + PIPE FITTINGS AND ACCESSORIES	30000
8	**COST OF IMPLEMENTS, WEIGHING MACHINE AND OTHER UNFORSEEN EXPENDTURE**	20000
GRAND TOTAL		**155120**

Savings in any component can be utilized for meeting the expenditure pertaining to any other sub component listed above.

DAIRY DEVELOPMENT DEPARTMENT COMPREHENSIVE SCHEME FOR MASSIVE FODDER PRODUCTION IN SELECTED PANCHAYATS FINANCIAL ANALYSIS	
PARTICULARS	**YEAR : 2021-22**
Expenditure	
LSGD CONTRIBUTION-MNREGS	0
DEPT SUBSIDY	93007
BEN. CONTRIBUTION	62113
GRAND TOTAL COST (1)	**155120**
Revenue	
YIELD PER HECTRE - 160 TONNES PER ANNUM (@Rs 2.5 per KG) **(2)**	**400000**
ESTIMATED PROFIT	**244880**

FINANCIAL ABSTRACT

YEAR	UNIT COST (PER HA)			TOTAL COST - FOR 84 Ha		
	COST PER HA.	DCS CONTRIBUTION	PLAN ASSISTANCE	TOTAL COST	DCS CONTRIBUTION	PLAN ASSISTANCE
2021-22	**1.551**	**0.621**	**0.930**	**130.284**	**52.164**	**78.126**

Rs in lakh

4.09.07 IMPLEMENTATION AND MONITORING

The Block Level Officer (Dairy Extension Officer / Sr. Dairy Extension Officer) shall be the implementing officer of this scheme component. The Implementing officer shall be assisted by concerned Dairy Farm Instructors and Dairy Promoters.

Monitoring of the District level programme shall be the responsibility of the District Deputy Director. The District officer shall be assisted by The Assistant Directors of the District (Technical Assistant & Quality Control Officer). The District Deputy Director shall report periodically the progress of the scheme component to the Directorate.

The Director, Dairy Development shall monitor the state wide progress of the scheme component. The Joint Director (Planning), The Deputy Director (Planning) and the officers of Project Cell shall assist the Director for making periodic assessment regarding the progress of this scheme component.

04.09.08 CALENDAR OF ACTIVITIES

CALENDER OF ACTIVITIES		
SI.NO	**ACTIVITY**	**PERIOD**
1	Administrative Sanction Orders.	before 15.04.2021
3	Propaganda for the programme	before 10.05.2021
4	Selection of beneficiaries	before 05.06.2021
5	Training at District Level	before 05.07.2021
6	Land Preparation activities at selected plots	before 20.08.2021
7	Fodder Cultivation activities	Aug, 2021 – Oct, 2021
8	Project Evaluation	before 15.11.2021
9	Release of Plan Assistance	before 15.12.2021
10	Documentation of the Programme	before 05.01.2022
11	State Level Evaluation	before 25.01.2022

04.09.09 EXPECTED OUTCOME

- The project is in tune with the state and central policies in regard to utilisation of barren land available in the state by way of encouraging fodder cultivation.
- The project will result in establishing a model fodder development programme for the state so as to utilise the barren land

- Profitable dairying activity will be ensured by way of reduced cost of production
- An additional 84 Ha of land will be brought under fodder cultivation
- Additional fodder production of 14000 MT per annum will be ensured
- Additional employment generation of 1750 Man days per annum.
- Ensures diversification of DCS activity and taking up farmer centric activity.
- Additional revenue generation avenue for the DCS
- Ensures health benefit for cattle by way of more ensured availability of green fodder

04.10. SCHEME FOR FODDER CULTIVATION AND MARKETING BY SHG / DCS / WOMEN GROUPS / OTHER REGISTERED GROUPS (Plan Out lay – Rs 5.250 lakh)

Introduction

The non availability of land for fodder cultivation discourages many farmers from taking up dairying. If fodder is made available at cost on a regular basis many of these farmers will take up Dairying or increase the number of animals reared which would boost up the milk production of the state. There are many SHG / DCS / WOMEN GROUPS / OTHER REGISTERED GROUPS within the area of operation of a Dairy Cooperative who are willing to cultivate, collect and market fodder to the needy farmers at a cost. These SHG / DCS / WOMEN GROUPS / OTHER REGISTERED GROUPS can be assisted to cultivate fodder in their own or leased land and also collect the natural grass and other crop residues available in the locality , chaff it and pack in gunny bags and bring it to the DCS where the needy farmers can purchase it .

The scheme

The scheme envisages assisting the SHG / DCS / WOMEN GROUPS / OTHER REGISTERED GROUPS under the supervision of the Dairy Co-operative to take up fodder cultivation and marketing to the needy farmers. Groups consisting of two or more individuals can be formed within the area of a DCS. The group members may take up fodder cultivation in their own land or in leased land. The minimum area to be cultivated should be one acre. They may also collect locally available natural grass or other crop residues like plantain leaves and stem, coconut leaves after removing the spine and other stem and leaves (tapioca, pineapple etc) which can be chaffed and mixed with the cultivated grass. A chaff cutter will also be provided to them. A shed to store the collected and chaffed fodder and a platform balance to weigh the fodder will also be provided. The chaffed fodder will be packed in gunny bags and carried to the DCS where dairy farmers come twice daily to pour milk. Those farmers who are in need of the fodder can purchase the fodder at a cost decided by the SHG / DCS / WOMEN GROUPS / OTHER REGISTERED GROUPS based on the demand in the area.

Assistance for One Group (One Acre of Land)

Sl. NO	Particulars	Cost	subsidy
1.	Cost of cultivation of fodder in One acre of land	20000	15000
2.	Chaff cutter , and electrical accessories	20000	15000
3.	Shed for storing equipments, tools ,implements and fodder	20000	15000
4.	Weighing balance (platform type)	20000	15000
5.	Tools and implements for cultivation , harvesting , gunny bags for packing chaffed fodder etc	20000	15000
	TOTAL	**1,00,000**	**75,000**

The estimated cost for establishing one unit is Rs. 1,00,000/-. for which Rs. 75,000/- will be provided as subsidy for the year 2021-22. The remaining amount has to be channelized by the beneficiary group through own fund or bank loan. It is estimated that the group will be able to sell about 150 to 200 tons of fodder a year at an estimated cost of Rs. 3/Kg.

Registration Fees – Rs 180 per beneficiary

Financial Outlay –SHG/DCS/OTHER Marketing Groups

FINANCIAL OUTLAY FODDER CULTIVATION AND MARKETING BY SHG/DCS/WOMEN GROUP						
TOTAL NUMBER OF GROUPS	**UNIT COST**			**COST FOR TOTAL UNITS**		
	TOTAL	**SUBSIDY**	**BENEF. CONT**	**TOTAL**	**SUBSIDY**	**BENEF. CONT**
	Rs	**Rs**	**Rs**	**Rs in Lakh**	**Rs in Lakh**	**Rs in Lakh**
7	100000	75000	25000	7.000	5.250	1.750

04.11 . ASSISTANCE FOR MINI / COMPACT AND LOW COST HYDROPONIC FODDER UNITS (Rs 24.950 Lakh)

04.11.01 Introduction

Kerala is considered as a state in India having highest cost of milk production. Studies have revealed that the cost of production of milk in kerala is around Rs 32 per litre. This is mainly due to acute shortage of green fodder and crop residue, low productivity of animals, less availability of land, high labour cost etc. The high cost of production has made the dairying activity less profitable. The solution to solve this to adopt modern technologies for reducing the cost of milk production. Hydroponic fodder can be considered as one of the most suitable solution and most advanced technology available to solve the shortage of concentrates and fodder. Its now a world wide accepted technology. Since majority of our dairy farmers belong to marginal group, MINI/COMPACT AND LOW COST HYDROPONIC FODDER MACHINES are most advisable to them. Its cost effective to the farmers also.

04.11.02 Objective

- To establish 23 No.s of Mini Compact and Low Cost Hydroponic systems suitable for farmers rearing 2 to 8 milch animals
- To produce highly nutritous Hydroponic fodder required for 2 cows and their calves (45 kg – for 2 cows/day upto 180 kg of Hydroponic fodder – for 8 cows/day)
- To reduce the cost of milk production to Rs 12/litre
- To produce milk with 4.5 % Fat and 8.8 % SNF
- To reduce uitilization of resources like land, water and labour

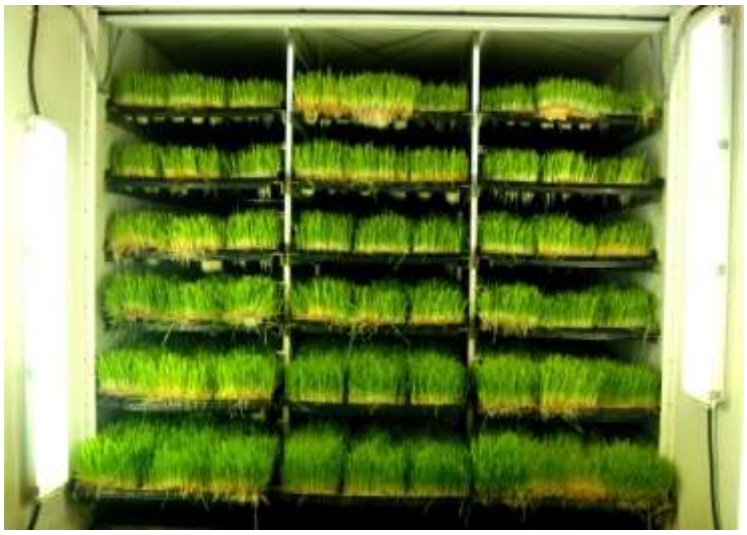
04.11.03 Need And Justification

Cattle rearing in the state is facing a lot of uphill challenges. The major constraints of this activity is the high cost of milk production due to dependency on the high cost concentrate feeds, lack of percapita availability of land for fodder cultivation, labour shortage etc. The concentrate feed cost is too high as Rs 1350 per bag of 50 Kg.

Since the labour cost is too high farmers are reluctant to provide sufficient food to animals. This causes under feeding of animals which in turn leads to loss in production potential and hence may lead to sterility. Undesirable quality of concentrate feeds may damage cattle health and also create health hazards to the consumers through its aflatoxin content. The required quantity of minerals are not received through cattle feed. Lack of vitamins also leads to delayed pregnancy and even death, which results in decreased profitability to the farmer

More over the concentrate feeds available in the markets are lacking sufficient energy required for milk production. Hydroponic fodder offers total solution to the above problem. It provides adequate energy, protein, fat, minerals and vitamins at a stretch in the form of fodder. MINI HYDROPONIC MACHINES will be most suitable for farmers rearing two milch animals. 18-20 kg of hydroponic fodder is sufficient for a milch animal which produces 15 litres of milk daily. It is assumed that I kg concentrate feed can be replaced by 5 kg of Hydroponic Fodder. It has

to be supplemented with either 5 kg dry fodder or 10 kg green fodder to meet fiber requirements. Aflatoxin free milk can be produced by feeding hydroponic biscuits which is not at all possible when fed with concentrates. Moreover 0.3% increase in fat and upto 0.4% increase in SNF also is noticed together with a 10% increase in milk production. While feeding with hydroponic fodder, the production cost of one litre of milk comes to around Rs 13 where as it is almost as high as Rs 32 per litre when fed with concentrates. The urea content in concentrate pellets also leads to infertility in animals. In short, safe organic milk can be produced by feeding hydroponic biscuits.



Registration Fees – Rs 200 per beneficiary

04.11.04 Beneficiaries

The beneficiaries of the scheme shall be 23 elite and progressive farmers of the state . 8 No. of famers who rear 2 cows, 10 no. of farmers who rear 5 cow and 5 no. of farmers who rear 8 cows will be assisted under the scheme. The selected beneficiaries shall be pouring milk to a Dairy Co-operative registered under the Dairy Development Department. He shall have fodder cultivation in Minimum 10 cents of land.

04.11.05 Unique Features

The unique features of proposed Compact, Low Cost Mini Hydroponic Systems are as follows

- Reduces the cost of milk production (up to 30%) and increases the profitability in cow rearing
- Optimum use of natural resources (only 200 litre of water is sufficient to produce 50 kg of hydroponic fodder)
- No need of inputs like soil, manure, fertilizer and labour which considerably reduces the cost of fodder production and hence the cost of milk production
- Wonderful production of biomass (I tonne fodder from one cent of land area daily) which minimize land requirement in cattle rearing.
- Feed supplements like mineral mixture, vitamin A supplement can be fully avoided
- Equipment is quite handy, less complicated, less running cost. It can be kept in kitchen and manufactures as plug & play model.

04.11.06 The Technology Of Hydroponic Fodder

The technology of HYDROPONIC FODDER is the most modern concept of fodder production. It is a process of germination of suitable grains or legumes under hydroponic principles i.e cultivation without soil. In this process the seeds are allowed to grow under most favorable climate conditions such as humidity, temperature etc. for a particular period (normally up to 6 days)

In Compact/ Low Cost/ Mini Hydroponic units 200 litre of water is required to produce 45-50 kg fodder biscuits (germination is carried out at controlled temperature (18 degree Celsius) and humidity (50-100%) which avoids any chance of contamination. Seeds become young plants in seven days, regardless of the available soil and type of climate. A layer of succulent and fresh green forage (Mat / Biscuit) is obtained. It is sweet and devoid of any harmful microbes with high nutritive value and ready to be used as feed for animals. During germination process enzymes that metabolize the seeds' starch and protein reserves are triggered, converting them into basic nutrient elements (amino acids and sugars) and create new vegetable tissue rich in totally natural vitamins that are assimilated easily. A highly digestible natural food is obtained, which is expected to increase productivity, performance, and improve the general health of animals.

04.11.07 Technical Specification Of the MINI/COMPACT AND LOW COST HYDROPONIC SYSTEM

- Produces 30-45 kg of Hydroponic Fodder for 2 cow unit to 160-180 kg of Hydroponic Fodder for 8 cow unit
- Dimensions – [1-1.5 m long] X [1.5-2.0 m wide] X [2-2.5 m height]
- 1 Tray – 1.2 – 2 kg seed == 11-19 kg of Hydroponic Fodder (output)
- Temperature of inside the chamber will be 16-18 degree Celsius
- Power requirement – single phase and usage will be approximately less than 5 Units per day
- 200 litre of water is required daily including cleaning
- Flooring / Basement requirement – [1.5-2.0m] X [1.1-1.5 m] X [2.5-2.7 m]

04.11.08 The Process

The low cost hydroponic unit is designed with specifically designed fiber container with racks inside and also have temperature control facilities. The trays are placed in their racks. The temperature and humidly is controlled automatically. The seeds are grown in food grade specially designed plastic trays and the water is sprinkled as per requirement. No fertilizer, soil or other inputs will be provided for sprout and is allowed to grow aseptically. The entire unit is controlled automatically and the parameters can be monitored through displays.
Seeds used inside the machine can be maize, barley and wheat. The seeds are washed thoroughly and soaked in water for an overnight. 1.2 to 2.0 kg of seeds are to be placed in each tray. The trays are kept inside the machine and allowed to grow for seven days. Since both sides of the container can be opened, seeding can be done from one side and withdrawal from the other. The biomass will become 8 to 9 times and the same is removed from the tray and the highly nutrient entire mat is given to the animals. The process of seeding is continued everyday so that the continuous production is ensured. 18-20 kgs of hydroponic are required for a single milch animal with 15 litre per day capacity. Sprouted seedlings are more palatable and spouting enables all the nutrients in easily absorbable form. It is also rich in water content. The starch content in the fodder serves as reserved energy.

04.11.09 Nutrient Content Of Hydroponic Fodder

Hydroponic biscuits are enriched with the following nutrients

Crude Protein	: 20.2 %
Crude Fibre	: 11.3 %
Fat	: 4.3 %
Starch	: 15.4 %
Calcium	: 0.15 %
Potassium	: 0.7 %
Magnesium	: 0.25 %
Phosphorous	: 0.46 %
Sulphur	: 0.28 %

Boron : 22 mg / Kg
Copper : 11 mg / Kg
Iron :160 mg / Kg
Vit A : 42.7 IU
Vit E : 62.4 IU
Metabolisable Energy : 13.5 Mega Joule per Kg

04.11.10 Hydroponic Feed Requirements For Animals

18-20 kgs of Hydroponic Fodder are sufficient to meet the nutritional requirements of milch cow yielding 15 litre of milk per day. Ten percent of increase in milk production and 14% increase in butter fat are noticed while feeding hydroponic biscuits.

04.11.11 Cost of Milk Production When Fed With Hydroponic Fodder

EXPENDITURE (PER DAY) – 2 cow unit	**Amount (Rs)**
cost of seed (1.2 kg /biscuit X Rs 30 / Kg X 6 biscuits)	216
cost of water (250 Ltr per 6 biscuits X 25 ps per litre)	62.5
cost of 10 kg fodder as supplement	30
cost of electricity (5 units per 6 biscuits X Rs 7 per unit)	35
cost of transportation of seed (Rs 5 X 1.2 Kg/biscuits X 6 biscuits)	36
TOTAL FEED COST (per day)	**379.5**
Feed Cost per litre of milk	**Rs 12.65 per litre**

04.11.12 Unit Cost

COMPACT/LOW COST/MINI HYDROPONIC FODDER UNITS			
(FOR CATERING FODDER NEEDS OF 2 - 8 MILCH ANIMALS)			
	2 MILCH COW	**5 MILCH COW**	**UPTO 8 ANIMALS**
PARTICULARS	**AMOUNT (Rs)**	**AMOUNT (Rs)**	**AMOUNT (Rs)**
COST OF HYDROPHONIC MACHINE (INCLUDING TRANSPORTATION, UNLOADING AND OTHER TRANSIT CHARGES)	90000	120000	150000
SEED COST FOR ONE MONTH AND TRANSPORTATION CHARGES	6000	12000	20000

MAINTANANCE, POWER AND SERVICE CHARGES	2500	5000	7500
INSURANCE CHARGE	5400	7200	9000
SHED CONSTRUCTION,PLATFORM CONSTRUCTION, SEED STORE FACILITIES, DRAINAGE FACILITIES ETC	25000	40000	50000
MISCELLENEOUS	4500	5000	5500
GRAND TOTAL	**133400**	**189200**	**242000**
SUBSIDY	**80040**	**113520**	**145200**
Subsidy rounded off to	**80000**	**113000**	**145000**

Savings in any one component shall be utilized for any other component in the scheme

04.11.13 Financial Outlay

ASSISTANCE FOR ESTABLISHING MINI COMPACT LOW COST TYPE HYDROPONIC SYSTEMS

SI.NO	PARTICULARS	NO. OF UNITS	FOR ONE MACHINE			FOR TOTAL HP MACHINES		
			TOTAL COST	UNIT SUBSIDY	BEN. CONTR.	TOTAL COST	PLAN FUND	BEN. CONTR.
			Rs.	Rs.	Rs.	Rs. In Lakh	Rs. In Lakh	Rs. In Lakh
1	MINI HYDROPONIC SYSTEMS (FOR 2 COW UNIT)	8	133400	80000	53400	10.672	6.4	4.272
2	MINI HYDROPONIC SYSTEMS (FOR 5 COW UNIT)	10	189200	113000	76200	18.92	11.3	7.62
3	MINI HYDROPONIC SYSTEMS (FOR 10 COW UNIT)	5	242000	145000	97000	12.1	7.25	4.85
GRAND TOTAL						**41.69**	**24.95**	**16.74**

04.11.14 Advantage Of The Scheme

- Feed cost limited to Rs 12.65 per litre
- Feed supplements like minerals and vitamins can be avoided
- 10 % hike in milk production
- 0.3 % hike in fat and 0.4 % hike in SNF
- Machine can be operated in single phase
- 2 KV inverter is also supplied with the machine with 6 hour back up
- Provides all essential nutrient for animal producing 15 litre milk per day.

04.11.15 Implementation, Critical Evaluation and Monitoring

The Dairy Extension Officer shall be responsible of the block wise evaluation of the scheme. The Deputy Director shall be the authority for final approval of beneficiary and shall monitor the distirct wise progress of the scheme. The Director,Dairy Development shall monitor and evaluate the progress of state wise implementation of the the programme.

Continous evaluation and monitoring shall be done by a Technical committee consisting of Dairy Extension Officer of that unit, One Dairy Farm Instructor, President of the society, Secretary of the society and beneficiary of the scheme. They shall evaluate the improvement in quality and quantity of milk, general health condition of animal, mode of feeding, economics of feeding and performance of the machine.

04.12 ASSISTANCE TO STATE FODDER FARM, VALIYATHURA, TVM (Plan Outlay – Rs. 10.00 Lakh)

The State Fodder Farm, Valiyathura under Dairy Development Department at Valiyathura, Trivandrum is producing fodder for supply to the dairy farmers in and around the city. The Farm also supplies root slips, stem cuttings for fodder propagation in addition to the sale of fodder. A new fodder training centre has been established at State Fodder Farm, Valiyathura. The treated water from the sewage treatment plant can be used for irrigating the fodder cultivated in the farm. Necessary infra structure is to be created for upgrading the farm as **State Fodder Farm cum Fodder Training Centre**. The existing fodder cultivation is to be sustained for supplying fodder and planting material to farmers. It is proposed to set apart a portion of the outlay to meet the expenditures incidental to the activities of the farm, crop maintenance, fodder/ planting material, to dig a Bore well, purchase PVC storage tank, facilities for irrigation using treated water from Sewage treating plant, de-silting of canals, repairs and maintenance of buildings, fencings, transportation, purchase of farm equipments and small implements, a Hydroponic machine for Demonstration purpose, etc. During the year 2021-22, under the budget provisions, a new institution viz. Kerala State Dairy Management Information Centre (KSDMIC) is proposed to be started as SFF, Valiyathura. Consultancy charges for the preparation of plan and estimate for the proposed centre at State Fodder Farm shall also be met from the budget provision. Any development activity for the state fodder farm shall be undertaken under this scheme component. In case of components not detailed in this DPR, The Farm Superintendent shall submit a detailed proposal for final approval from the Director, DDD

Plan Outlay (Lump sum Amount) – Rs 10.00 lakh

05. CONCLUSION

The above schemes will help to nurture the fodder development activities of the state, will generate self employment opportunities and will help to reduce the feed cost and thereby ensuring the socio-economic security of the farmers.

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