

AREA DEVELOPMENT SCHEME –INTEGRATED FARMING SYSTEM

1. Introduction:

Dependence on rainfed agriculture, uncertainty/unpredictable nature of climate year after year etc have impacted on production, productivity and income of the farmers who are contributing towards the food security of our nation. There is need for reducing the risk of farmers especially in dryland/rainfed region through promotion of suitable multi activities to ensure regular income to farmers involved. Further, Government of India during the union budget 2016-17 has announced doubling of farmers income by 2022.

Under the above strategies one of the points emphasized is on promotion allied and ancillary activities as part of Integrated Farming System approach. **Integrated farming** (or **integrated agriculture**) is a commonly and broadly used word to explain a more **integrated** approach to **farming** as compared to existing monoculture approaches. It refers to agricultural **systems** that integrate livestock, fisheries, crop production, horticulture, etc. Such scheme offers more scope for implementation.

INTEGRATED FARMING SYSTEM MODEL – Kanjikuzhi and Aryad Blocks of Alappuzha district

In the instant model the unit area proposed is 25 cents the scheme is proposed to be implemented by individual farmers as well as JLG groups. Kanjikuzhi block is known for organic farming by individual farmers as well as JLG groups. Kanjikuzhi PACS is promoting all farming activities and regularly conducting classes for Organic Farming through their Farm School. Muhamma PACS is also involved in implementing various farmer friendly activities. Hence these two PACS will be actively involved in implementing the suggested Area Development Schemes.

2. Activities:

2.1. Goat Rearing

Kerala has a large and diverse genetic resource of goats. Goat plays a significant role in economic upliftment of rural poor of our country. Consumption of goat meat (chevon) is increasing rapidly due to its social acceptability. This sector has tremendous potential in employment generation & poverty reduction.

As per the 19th Quinquennial Livestock animal Census 2012, there are 55158 goats in the district, marked a fall from the position of 2007 census. In Goats, *Malabari* and cross-bred of *Jamunapuri* breeds are reared. An emerging trend is rearing of breeds like Boer, Beetle, Barbari, Sirohi, etc., brought from other States. All the blocks in the district are having goat rearing in a small scale as an income generating activity, which could be credit linked and thereby further extending the scope.

Goat-rearing is emerging as a self-employment venture among women in the district. Women SHGs are actively involved in goat-rearing as a subsidiary occupation and livelihood occupation. *Aadugramam*, the widely-acclaimed *Kudumbushree* initiative is successfully implemented in Mannancherry panchayath in the district. The women-rearers are getting good income not only from selling goat milk, but also goat droppings and urine are sold as manure and as input for ayurvedic medicines, respectively. Proximity of Kanjikuzhi and Aryad block area to Mannancherry makes it possible to avail need based extension services from the experienced farmers and also enable easy supply of goats for rearing as per availability.

(a) Availability of animals

The goats will be procured locally from the groups implementing AADUGRAMAM at Mannancherry and also from nearby blocks. In case of more demand, more number of Malabari goat breed is available in adjacent Pathanamthitta district. The services of the veterinary surgeon at the Panchayat level will be utilized for the project. Kudumbashree also offers assistance for veterinary help. In private sector, Marari Goat Farm, S L Puram is presently engaged in supply of quality fresh goat milk.

(b) Feed and Fodder Development:

Concentrated feed will be purchased in bulk and supplied to the groups/ individuals through Kudumbashree/ FPOs involved. Fodder cultivation in 3 cents of land is also a project component.

(c) Marketing:

Marketing of goats will be facilitated primarily through Kudumbashree units. There is good demand for mutton in the district and will have local demand competitive price. The sales of manure is not considered under this project and will be used for the cultivation of turmeric and vegetables/ banana/green fodder etc. The urine of goat has high demand from Ayurveda companies and the groups can make arrangements for the same with the assistance of Kanjikuzhi/ Muhamma PACS/ Kudumbashree. There is a well designed Organic Farm products market outlet under Kanjikuzhi block which is functioning well. All vegetables produced after meeting the local requirements may be marketed through this outlet, which is located in a prominent place facing National Highway.

Kanjikuzhi and are predominantly an agriculture belt in the district, major crops in the block are banana, tapioca, paddy, coconut, vegetables, etc. Cultivation of turmeric, other medicinal plants and floriculture are also promoted. All the components suggested in this IFS model are promoted on a standalone basis and has proved to be suitable to the agro climatic conditions and social and economic condition of the people.

Good quality banana rhizomes will be purchased from progressive farmers with the help of Krishi Bhavan Officer. Seed material for turmeric cultivation is also made arranged through the groups who have undertaken Turmeric cultivation in the block. Seeds of vegetables, green gram and green fodder will be supplied to the project through GSGSK, S L Puram, KVK Kayamkulam and Krishibhavan.

Kanjikuzhi PACS is having a marketing outlet along with their premises facing National Highway, dealing primarily in organic/ safe to eat quality products. Further, VFPCCK, also supports in the marketing of banana and surplus vegetables, if any, generated from the project.

3. Selection of the area:

Nearly 400 to 500 families – including JLGs comprising 100 acres in Kajikuzhi and Aryad Blocks are proposed to be covered under this scheme.

4. Selection of beneficiaries:

AADUGRAMAM was undertaken by Kudumbasree in Mannacherry panchayath and its positive results are still evident. Homestead farming is widely practiced and most of the families have very small land holdings. Extensive cultivation in a single piece of land is possible only in case of leased land farming. In the proposed model 25 cents of land is considered in case of a single farmer and 1 acre of leased land farming is considered for a JLG with 4 members. The unit size proposed is 25 cents with the following components:

- a. Goat Malabari 5+1 area required- 105 sqft

- b. Banana 50 plants (10 cents) with vegetables and green gram as inter crop
- c. Turmeric – 10 cents
- d. Fodder – 3 cents
- e. Water harvesting

5. Training and Capacity building of the beneficiaries

KVK, Alappuzha will extend training on scientific rearing of goat. The training on cultivation of banana, turmeric, vegetables etc will be conducted with the help of Krishi Bhavans, KVK, ATMA etc

6. Techno economic assumptions & project components

Components of integrated farming

S.No.	Particulars	No of plants/ area covered
1.	Goat rearing- (5+1)	105 sq ft
2.	Banana- 50 plants	50 plants/ 5 cents
3.	Medicinal plants- Turmeric- 10 cents	10 cents
4.	Vegetables and green gram as intercrop	5 cents
5.	Fodder	3 cents
6.	Water harvesting	Every household of the participating members.

6.1 Unit size

The ideal unit size is fixed at 25 cents taking into consideration the low per capita availability of land and to bring in more marginal farmers with the objective of doubling their income. The components of the project are as detailed in the above table.

6.2. Techno economic assumptions for -

6.2.1. Goat Rearing

In the proposed model –IFS, the ideal unit area considered is 25 cents per individual, which works out to 1 acre per JLG of 4 members. One family is given 5 does and 1 buck, which is integrated with fodder in 3 cents of land - border crop, turmeric in 10 cents of land, 50 banana in 5 cents of land, vegetables and pulses as intercrop and water harvesting for recharging of wells/water bodies. The cost of does suggested is Rs.9000/doe and Rs.10000/buck.

Construction of Shed

20 square feet of space is needed for one buck, 10 sqft for one doe and 4 sqft for kids.

- Roofing is suggested with coconut palm leaf or tiles set
- Water supply with automatic tool
- Kennel should be set at a height of about 3 feet above ground level.

The construction of shed will be undertaken by a JLG who will be trained for the purpose. The materials for the construction of shed will be procured in bulk and training on construction will be provided by KVK.

Feed

- For goats, requires 1-3 litres of water per day. It also fed with 1 to 2 kg of forage sorghum / fodder and 250 to 300 grams of concentrate feed per day.

Technical feasibility:

This project report is based on following assumption:-

- Adult healthy Does & bucks of Malabari cross breed within 2 years of age will be purchased/ supplied by Lead farmers or Kanjikuzhi/ Muhamma PACS with the advice of Deptt of Animal Husbandry.
- Manure produced in the farm will be utilized for fodder cultivation
- All goats will be insured. In case of death of adult goats, new animal will be purchased from insurance claim.
- The above project will be economically viable under proper care & attention of the individual farmer/ entrepreneur.

Techno-economic parameters

1	Breed of Goat	Malabari cross
2	System of rearing	Semi intensive
3	No. of Bucks	1
4	No. of Does	5
5	Age at Maturity (Months)	10-12
6	Kidding/ interval (Months)	8
7	No of kidding/year	1.5
8	Kidding percentage	80
9	Average litter size (average of single, twinning, Triplet, quadruplet)	2
10	Sex ratio	1:1
11	Mortality (%) Kids	20
12	Saleable age of kids (months)	11
13	<u>Expenditure norms</u>	
14	Space requirement sq ft. Per head for Buck	15
15	Space requirement sq ft. Per head for doe	10
16	Space requirement sq ft. Per head/kid	4
17	Shed – wooden (105 sq ft @ Rs.433/- per sq ft) 10 sq. ft /animal – Does, 15 sq ft/buck, 4 sqft/kid for 10 kids.	45500

18	Feed cost for 7 months (@ 300g per animal per day @ Rs.24 per kg) (feed cost for 7 months is capitalized. For P/L account, the feed cost for 1 year is taken.	9072
19	Labour (No.)	FAMILY LABOUR
20	Insurance (as % of the cost of breeding stock)	6%
21	Veterinary aid (Rs./adult/year)	218
	Income norms :	
22	Sale price of Buck/(11month)- 15 kg, @Rs.300/kg	4500
23	Sale price of Doe/(11month)- 12 kg, @Rs.300/kg	3600
24	Income from manure is not assumed as it is used on the own farm for fodder cultivation.	
	Repayment	
25	Repayment period (years)	6
26	Grace Period (years)	1
27	Interest rate (%)	9

Concentrate feeding months for kids and sale schedule of kids (Goat)

Year	I	II	III	IV	V
Kidding months	8	16&24	32	40 & 48	56
Kidding No.	I	II & III	IV	V & VI	VII
No. of kids born	7	7+7	7	7+7	7
Mortality	2	4	2	4	2
Kid conc feeding months	0	2	1	2	1
Sale months	-	16&24	32	40&48	56
No. of kids to be sold					
Bucklings		5	3	5	3
Doelings		5	2	5	2

6.2.3. Cultivation of fruits, medicinal plants, vegetables, and green fodder:

Banana is one of the major and economically important crop in the district. Nendran variety is proposed under the project. 50 plants per unit are considered. The planting season for rainfed crop is April-May and season for irrigated crop is August-September. The planting season should be adjusted depending upon local conditions. Avoid periods of heavy monsoon and severe summer for planting. Adjust the time of planting so as to avoid high temperature and drought at the time of emergence of bunches (7-8 months after planting). The planting materials will be procured and supplied through the Cooperative Society. Family labour is mainly intended for the cultivation. The scale of finance of Rs.175 per plant is considered for the project.

- Turmeric/ Manjal is the ingredient of almost all the ayurvedic medicines. The cultivation of turmeric on a trial basis was done in Aryad block during last year with the support of KVK, Kayamkulam. Many farmers in Aryad and Kanjikuzhi blocks presently involved in turmeric cultivation after attending a training arranged by KVK, Kayamkulam. FPO on

spices promoted by KVK, Kayamkulam are procuring quality turmeric for processing. They also supply quality turmeric seeds to the needy farmers. The variety cultivated is Prathibha, and they have collected seed material for the ensuing season from the crop. Prathibha has high curcumin content and is preferred by the Ayurveda companies. Under the proposed ADS of NABARD through JLG programme, turmeric cultivation will be promoted at least in 30 acres of land.

- b) The cost of seed material is Rs.60/kg and the seed rate is 700 Kg/ acre. For 10 cents 70 kg is required and the cost is 4200. In this model only the cost of seed material is considered under the project as the crop is grown organically and the organic manure is obtained from the manure of goats. Family labour is considered for the operations and in case of JLGs, joint labour of members and family is taken into account. The yield expected from 10 cents is around 1000kg (17-20 times of seed rate).
- c) Vegetables/ green gram will be cultivated as an intercrop- Bhindi, brinjal, bittergourd, green chilly, cucurbitaceous vegetables etc as per the choice of the farmer is proposed for cultivation for consumption purpose. Green gram is proposed for enriching soil fertility as also to enhance the nutritional security. Fodder will be cultivated as a border crop
- d) Water harvesting systems will be installed in every household. NREGA convergence is sought for this purpose from the Panchayat.

7. Partners in implementation, convergence of efforts & support from State Government:

The Programme will be implemented in Kanjikuzhi and Aryad blocks primarily by the Kudumbashree JLGs. Kanjikuzhi/ Muhamma PACS and progressive farmers will be promoting the scheme through individuals and JLGs- 200 members in Kanjikuzhi, Aryad and Mararikulam Panchayats of these blocks. The incentives available under various state and or centrally sector under a particular agri and allied sector will be dovetailed with the scheme. The Scheme will be monitored by a team comprising LDM, DDM, KVK and local Krishi Bhavan Agri Officers.

8. Project cost for each unit / activity:

Sr. No.	Particulars	Cost (Rs.)
A.	Capital Cost	
A	Goat rearing	
i.	Goat rearing (5 does + 1 Buck)	
	Cost of 5 does (Adult 1year old) (8500*5)	42500
	Cost of 1 buck (Adult 1year old)	10000
	Shed – wooden (105 sq ft @ Rs.433/- per sq ft) 10 sqft /animal – Does, 15 sqft/ buck, 4 sqft for kids for 10 kids	45500
	<i>Insurance @ 6% per year (to be renewed every year)</i>	3150
	Feed cost for 7 months (@ 300g per animal per day @ Rs.24 per kg)	9072
	Medicines and de worming @ Rs 218/ animal	1308
	Total	111530
B	Banana Rs.125/plant -50 plants	6250
c	Medicinal plants Cost for 10 cent	4500
d	Vegetable cultivation and pulses as intercrop (only working capital) for 5 cents	1000
e	Fodder as border plant	150
f	Water Harvesting	3000
	Total Cost (a+b+c+d+e)	123430
	Promoters Margin (approx. 15%)	23430
	Bank Loan	100000

Note: Based on the requirement and credit absorption capability of the farmers it is also proposed to consider poultry layer units-50-100 birds/dairy 2-4 animal unit / male buffalo rearing programme as the allied activity. NABARD unit cost suggested in PLP may be considered while considering such units.

9. Banking network and trend in financing:

Names of the Implementing Bank- Kanjikuzhi PACS, Muhamma PACS, KGB Kalavur branch, Federal Bank, SL Puram, Vijaya bank, Mararikulam branch

The above activities proposed have been financed by the various branches in the locality on a standalone basis. However an integrated approach focusing 'Doubling of farmers income' linking the various components will be implemented in 2018-19.

10. Physical and financial programme:

Bank-wise physical and financial programme has to be given in detail in a tabular form as suggested below:

District	Blocks	Name of the Bank	Unit Cost	No. of Units	TFO (Rs. Lakh)	Bank Loan (Rs. Lakh)
Alappuzha	Kanjikuzhi and Aryad	Kanjikuzhi and Muhama PACS	123430	200	246.860	200.00
		Federal bank, Vijaya Bank and KGB		200	246.860	200.00
		TOTAL		400	493.720	400.00

11. Project Profitability:

Depending upon the cash flow and gestation period of the activity considered under IFS model, the project profitability is worked out for a period of seven years- six years repayment with one year holiday as per the following details:

- No of kids available for sales in 2nd year-5, third year -10, fourth year -5 and fifth year -10 and so on
- Cost per kid –Rs300/kg, approx. 15 kg for a 6 month kid
- No of banana bunches available- 40 bunches/ year @Rs.45/kg
- Yield of turmeric in 10 cents of land- 1000 kg /ha, Rs.25/kg
- Vegetables and pulses produced under the project is not for sale. It is assumed that the same will be utilized for household consumption thereby increasing the nutritional security, safe food for consumption. It will help the farmer to reduce his market purchase for house hold consumption and enhances his net income.

Sr. No.	Particulars / Years	I	II	III	IV	V	VI	VII
I.	Income (Rs.)							
I	Goat rearing		20700	40500	20700	40500	20700	40500
Ii	Banana	18000	18000	18000	18000	18000	18000	18000

iii	Medicinal plants	25000	25000	25000	25000	25000	25000	25000
	Total income	43000	83500	63700	83500	63700	83500	63,700
II	Expenditure							
I	Goat rearing*	6480	20010	20010	20010	20010	20010	20010
Ii	Banana	6250	6250	6250	6250	6250	6250	6250
iii	Medicinal plants	4500	4500	4500	4500	4500	4500	4500
iv	Vegetables, green gram and green fodder	1150	1150	1150	1150	1150	1150	1150
	Total expenditure	18380	31910	31910	31910	31910	31910	31910
III	Gross Surplus (Rs.)	24620	51590	31790	51590	31790	51590	31790

*capitalized expenditure not taken into account, as loan component is involved.

12. Financial Analysis:

The financial analysis for a period of six to 10 years may be done depending on the mix of activities proposed to be covered under IFS model, gestation period of the activity covered and cash flow as detailed below:

Sr. No.	Particulars / Years	I	II	III	IV	V	VI	VII
I.	Cost (Rs.)							
i	Capital Cost	123430						
ii	Recurring Cost	18380	31910	31910	31910	31910	31910	31910
iii	Total Cost	141810	40910	39380	37850	36320	34790	33260
II	Total Benefits (Rs.)	43000	83500	63700	83500	63700	83500	63,700
III	Net Benefits	-98810	51590	31790	51590	31790	51590	31790
VI	Benefit Cost Ratio (BCR)							1.19
VII	Internal Rate of Return (IRR)							37

13. Sensitivity Analysis:

By assuming 10% increase in cost and 10% decrease in benefits, NPV, BCR and IRR is worked out in the table given below:

Sensitivity	IRR	BCR
10% increase in cost	32%	1.14

10% decrease in benefit	26%	1.11
10% increase in cost & 10% decrease in benefit	17%	1.06

Sensitivity analysis show that the BCR is above one in all the above three scenarios and IRR above 15% and hence the project is viable even with a 10% variation in cost and benefit.

14. Repayment Period:

Repayment period is worked out as 6 years with one year grace period.

15. Implementation and Monitoring:

The scheme was proposed at the DLRC meeting and was approved. A monitoring committee at district level with LDM/DD/KVK as members will monitor the implementation. A committee will be formed at block /panchayat level with all the stake holders as members to facilitate extension services, training support and to closely monitor the programme. The scheme will be reviewed in the BLBC and DLRC meetings.

16. Expected outcome and Conclusion:

Benefit of Integrated Farming System (IFS) – This model helps the farmers in maximizing his /her income with minimized burden on the environment. The model advocates sustainable farming with enhancement in soil fertility and increased nutritional security. The model helps in Productivity improvement and thereby enhances the Net profit growth and provides a fixed income to the farmer. The model also ensures a pollution free Environment through recycling of farm residues. The model ensures employment generation, additional income and enhances the standard of living of the farmer.
