

**Interchristian Fellowships' Evangelical Mission**  
**(IcFEM Mission)**  
**Holy Living & Hard Work**

**ELGON HILLS INTEGRATED DAIRY DEVELOPMENT PROJECT**  
**IcFEM MISSION**

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**STATEMENT OF THE PROBLEM**

The communities situated around the slopes of Mount Elgon live below the poverty line and therefore cannot afford sufficient and balanced meals in terms of Nutrient content. Sources from the Bungoma and Mt. Elgon District Development plan 2002-2008 reveal that the current rate of poverty stands at 56% and is likely to worsen with time. Consequently, there are high levels of malnutrition cases and food deficiencies especially among children under five years. This region has a high agricultural potential especially Dairy farming with various factors attributed to its suitability. Despite this enormous potential very little has been exploited and achieved.

**BACKGROUND INFORMATION**

The targeted region comprises 45 sub-locations within Bungoma and Mt. Elgon Districts, situated in Western Kenya. This region slopes gently away from Mt. Elgon and is mainly drained by the major rivers Kibisi, Kamukuywa, Sosio, Kuywa, Malakisi and Ndakaru, all of which originate from Mt. Elgon. Dairy farming in this region is still at infancy level despite the great potential that it has for this. Compared to grade cattle population, Zebu animals form the bulk of Dairy animals in this region. This is because of the traditional and cultural attachment held by the people to this local breed, such that they are unwilling to upgrade their cows to improve the milk production to meet the population's food and other economic needs.

The annual temperatures range from 19c to 27c. This region experiences a bimodal pattern of rainy seasons i.e. long and short seasons – Long rains March to June or July, short rains from August to October. Most of the rain falls during the long season when most of the farming activities take place.

The annual rainfall ranges from 1000mm to 1800mm. This climate is favourable for a wide range of agricultural activities which account for over 80% of the economic activity. The types of soil prevalent in these regions include mountain soils, volcanic footridges, footsteps and bottom land soils which are rich in organic matter and very well drained. This makes the region a potential area for agro-based industries, whose resource base can be major crops like maize, coffee, pyrethrum, wheat, oily and horticultural crops. The slightly cool climate is also ideal for the development of a dairy industry.

Demographically, these communities have more females than males. Therefore the women's contribution cannot be over-emphasized and should be incorporated fully when formulating agricultural policy at farm level. From the current District Development Plans, the region has a total population of 380,800, with a growth rate of about 2.4%.

The socio-economic infrastructure is not in place either. Health facilities are insufficient to serve the population. Most of them are private hence serving a limited population. This

clearly indicates that the remaining Government health institutions are over-utilized leading to congestion. Educational facilities are not well equipped. By way of example, some schools lack essential structures like classrooms etc.

These communities are criss-crossed by rural and farm access road, which supplement the classified tarmac road running from Bungoma town to Kitale town. Also they are not well supplied with electricity following the failure of the rural electrification programme. Hence electricity is only supplied within the towns and government developed schools. The water supply system is fair with the vast network of rivers and streams which ensure a steady supply of water. In addition to this, there is the community water supply project which has ensured provision of piped water in most parts of these communities. Also there are water points like boreholes, shallow wells and protected springs.

The main food crops grown include maize, beans, sweet potatoes, millet, peas, Irish potatoes, onions, tomatoes, kale and cabbages. Major cash crops include maize, coffee, tea, pyrethrum, wheat, and Irish potatoes. These are grown on small and medium-sized farms. Sunflower is the single important oil crop although groundnuts and simsim are grown on small scale.

Lack of efficient and effective marketing system for agricultural produce is a major challenge. The present marketing system does not sufficiently serve the farmers' marketing demands. Hence there is a need for a solution to this problem.

## ***FACTORS FACILITATING THE GENERATION OF A DAIRY PROJECT***

### ***(i) High Human Population Growth***

This is a major challenge especially when viewed against the limited resources in this region. These areas around the slopes of Mt. Elgon have escalating population growth rates. The area has a population of 380,800 people with a growth rate of about 2.4%. The population density is over 400 persons per square kilometre. This population poses higher demands for food and hence will offer a ready market for the dairy products, especially fresh milk for the elderly, and for the children under 5 years, who form a high percentage of the total.

### ***(ii) Land Scarcity***

Land resource is always limited to its usage demands especially here, with its smallholdings and medium farms, ranging from 2 – 10 acres, and due to the large local animal population (Zebus). Following the livestock population and distribution summary of March 2002 by the Livestock Production Office, an estimated total of 74,030 heads of zebu cattle against 20,465 heads of graded and crosses was obtained. This reveals that zebu animals form the bulk of the dairy herd on the slopes of Mt. Elgon. Also children are abused, especially school age boys who work as herd's boys, roaming with the zebus looking for pasture and water. There is a need to reduce the zebu herd population to create room for improved pasture and fodder establishment, which could also release young boys to go to school.

The zebu overstocking has resulted in overgrazing, causing environmental degradation. It is therefore necessary to reduce this stock and adopt improved dairy farming.

### **(iii) Favourable Climatic Conditions and Topography**

The favourable climatic conditions of this region, comprising 45 sub-locations, makes dairy farming a suitable activity to be carried out. The annual rainfall ranges between 1000mm and 1800mm with a bimodal pattern of rainy seasons i.e. short and long rains. The annual temperature ranges from 19 to 27 degrees. The soils prevalent in these regions include mountain, volcanic and bottomland, which are rich in organic matter and well drained. The altitude ranges from about 1200m to 2500 m above sea level. Hence these good soils, coupled with gently sloping, reliable rainfall, and the temperature range, make these communities have a high dairy farming potential, as there is abundant water for animals as well as for growing forages.

In addition, being a thermo-neutral zone, there should be no adverse effects on dairy farming, direct or indirect, such as heat stress or poor feed quality, nor is it an environment conducive to parasite build-up.

### **(iv) Increasing Urbanization**

There is a tendency for most people to be concentrated in urban centres and even congregate in small market places, which eventually grow up into towns. The proximity of these centres offers a ready market for milk and milk products, especially unprocessed or raw milk, because urbanization dictates a non-animal rearing condition for urban dwellers. Some of the urban areas in the region are Kimilili, with a total population of 81,300, Chwele 3,432, Sirisia 26,759. This calls for interventions like the provision of milk in these urban areas to care for the increasing population.

### **(v) Lack of sufficient milk to meet the population food demands**

The bulk of the dairy herd is formed by the zebu, whose milk production is insufficient to meet the people's protein needs, especially for the children who form a higher percentage of the population, and the elderly. This inadequate diet intake has caused malnutrition and food deficiencies, depressing the immune system and making the body vulnerable to disease and death.

### **(vi) Good marketing infrastructure**

The region has good marketing infrastructure. The crisscross rural and farm access roads which supplement the classified tarmac road running from Bungoma to Kitale town provide easy channels of movement from one place to another. Therefore surplus milk and other perishable products will be easily collected and distributed to the relevant consumers without much hindrance.

### **(vii) Availability of food crops for processing various animal feed rations.**

Under proper production and managerial skills, the region has abundant availability of various food crops which combine very well for processing dairy feed rations e.g. maize, sunflower, soya beans etc. This will ensure a continuous supply of raw materials for feed rations at a low cost. Besides, lack of efficient and effective marketing system for agricultural produce is a major challenge, especially for maize and other cereal crops. As a remedy an animal feed processing plant should be established to utilize surplus maize in the region to provide animal feeds for supplementation. In addition to that, dairy animals use much unsellable roughage arising from cereal harvesting i.e. crop residues.

### **(viii) Availability of excess labour force.**

With the ever increasing population and the crisis of unemployment, there is an excess labour force. Since dairy farming is labour intensive, this can be utilized through the establishment and development of a serious dairy enterprise in this region.

### **Conclusion**

Although this region has an enormous potential for dairy farming, very little has been exploited and achieved because of various setbacks. Poor feeding or nutrition is the major limiting factor to dairy development. There is not much attention, if any, given to animal nutrition. There are increased incidences of tick-borne diseases, especially East Coast Fever, arising from negligence and lack of knowledge of tick control and prevention measures. Consequently many dairy animals have died, reducing the dairy herd. Also the small farm size and the large number of zebus are another constraint on dairy development. This has resulted in a lack of space for fodder and pasture establishment or expansion. There is a lack of credit facilities and schemes to most rural farmers who cannot afford cash purchase of dairy stock, nor maintenance. The traditional and cultural attachment held by the people to the local zebu breed, and their unwillingness to upgrade them for high milk production is a major setback to dairy development.

There is therefore a need to improve the dairy farming industry through the following measures:-

- Gradual upgrading of the local zebus among willing farmers who will act as role models.
- Reduction of the zebu population to create room for establishment and better management of pastures and fodder.
- Maintaining good animal health through offering improved animal health backup services.
- Making credit facilities accessible to dairy farmers.

### **AIM OF THE PROJECT**

*To promote economic dairy and milk production through the provision of improved dairy stock, to provide food and employment to the ever-increasing poor rural people.*

### **OBJECTIVES**

- To provide a balanced food source, create employment opportunities so as to raise their living standards.
- To promote the Agricultural industry through the practice of improved and economical dairy milk production, organic farming and forage management.
- To provide better animal health management services, clean and safe milk production, and offer effective and reliable marketing channels.
- To make accessible to farmers credit and loan facilities (revolving Loan Scheme), and locally processed feeds for supplementation at affordable prices.

## **STRATEGIES**

### **A. *The Mission shall undertake this project at four basic levels over ten years.***

**(i) Breeders Farm Unit level**

The level aims at obtaining indigenous breeding stock, upgrading and distributing the upgraded stock to identified project farmers, who will act as role models.

**(ii) Farmers level.**

This targets the project farmers who are the immediate beneficiaries of the upgraded stock. They will prepare to meet required standards before acquiring the upgraded dairy stock.

**(iii) Animal feeds and feed processing level**

Raise raw materials, process and distribute to farmers at affordable prices.

**(iv) Milk processing and marketing level**

To ensure clean and safe milk production, offer collection, processing and marketing services to project farmers and other community dairy farmers, aimed at providing efficient marketing channels.

### **B. **Farmers proved capable from the first 15 sub-locations shall be identified.****

Every sub-location shall have five farmers who will be supplied with 2 upgraded in-calf heifers each on loan basis.

### **C. **Revolving Loan Scheme****

As a way of promotion and improvement of the dairy enterprise the Mission will establish a revolving loan scheme. This is to make credit facilities accessible to the project farmers. This loan shall be in the form of in-calf heifers and some cash between 10,000/- and 20,000/- for farm development. Repayments will be made by supplying milk to the Mission's milk processing plant (at least 10 litres). On completion of loan repayment, the project farmers will totally own the acquired graded animals and can opt to continue supplying milk to the processing plant as they wish.

### **D. **Special routine management procedures** shall be followed by the farmer and by specialist services from the Mission. The reproductive cycles of these cows shall be synchronized at different times to ensure there is a continuity of milk supply throughout the year for loan repayment and domestic consumption. Also oestrus synchronization will ensure that at least half the animals will calf down at almost a similar time for maximum utilization of capital facilities.**

The project farmers shall be encouraged to offer recommended feed resources to maintain high productivity and good health to their animals, and also to confine the animal wastes to be used as organic manure and for Biogas production.

### **E. **Feed Processing Plant and Animal Health Services****

To supplement the dairy diet, the Mission shall establish an animal feed processing plant within the community to supply feed concentrates. Pest and disease control measures shall be undertaken. All these aim at ensuring that each dairy head

yields at least 10 litres of milk per day. Consequently there shall be sufficient milk to improve the dietary intake of the project area and the surrounding communities.

GOAL It is hoped that by the end of 10 years, this region forming the slopes of Mt. Elgon shall have obtained milk sufficiency through the replacement of zebus by crosses and graded cows, financial stability, knowledge and improved living standards.

**ACTIVITIES – These will fall under various levels in 3 phases each.**

**(A) Breeders farm unit level**

**Phase I**

- Employment of 3 animal production technicians in charge of forage and training farmers on the same
- Leasing of 25 acres of land for 10 years for forage establishment and management
- Acquisition of forage inputs:- seeds, rightful vegetative cultivars, seed inoculators in case of legume fodder, fertilizer
- Establishment & management of forages.

**Phase II**

- Purchase/renting of 50 acres of land for breeding purposes. Alternatively the Mission can be in partnership with a large-scale farmer.
- Farm development activities:- Fencing, construction of necessary farm structure like crushes, milking parlours, feeders, drinkers, water piping, electricity fitting and power supply/power generator, zero grazing units, manager's quarters etc.
- Employment of other qualified personnel
  - 3 Animal health technicians – oversee health aspect of animals
  - 1 Livestock Officer – project co-ordinator
  - 1 Livestock manager – Overall project manager
  - 2 Watchmen – to guard the farm
  - 2 Farm Foremen
  - 2 Mechanics
  - 2 Drivers

NB. Each of these Technicians shall be in charge of 5 sub-locations.  
All personnel are on a contract for 3 years which is renewable.

**Phase III**

- Acquisition and development of breeders stock (200 crosses/zebu dams)
- Purchase of semen for A.I purposes/ 10 sires to obtain the foundation stock
- Purchase of freezers for semen storage
- Synchronization of heifers/dams oestrus cycle (This is meant to control parturition dates of the herd so as to have calves of same age for easy management and better utilization of capital facilities)
- Purchase of synchronization hormones
- Herd serving
- Identification of 75 farmers from 15 sub-locations (5 farmers from every sub-location to act as role models)

**(B) Farmers level: This involves the beneficiaries of the up-graded stock**

**Phase I**

- Setting aside 2 - 3 acres of land for forage establishment
- Land preparation
- Forage establishment and management

**Phase II**

- Acquisition of loan for farm development (Construction of simple necessary farm structures) to those who cannot afford it.
- Purchase of other dairy accessories like pumps etc

**Phase III**

- Acquisition of 2 upgraded and pure in-calf heifers on loan basis
- Practice daily routine management and procedures up to parturition /calving down
- Supply of milk to the Mission's milk processing plant (at least 10 litres per day supply)
- As part of the cost a certain amount of money is used for insurance purposes.
- Every location to have an Agro-vet shop for animal drugs.

**(C) Animal feeds and feed processing level**

Aimed at making feeds locally available for supplementation.

**Phase I**

- Identification of contracting farmers to grow and provide certain crops which combine well for animal feed rations e.g. maize, soyabeans, sunflower etc.
- Provide a way of involving other farmers to benefit from the project.
- Specialization of crop production.

**Phase II**

- Acquisition of land, 5 acres.
- Construction of feed storage facilities (silos, etc).
- Acquisition of feed processing machines
- Acquisition of raw materials for feed processing
- Installation of animal feed processing plant
- Animal feed processing activity

**Phase III**

- Storage of processed animal feeds.
- Purchase of 1 pick-up for feed supply and marketing plus 6 motorbikes for transport of personnel.
- To supply farmers with processed animal feeds at cheaper prices.
- Sale of surplus processed animal feeds.

**(D) Milk processing and marketing level**

- Provide for collection of milk, and distribution of processed milk and milk products to various consumers especially in urban areas where there is no room for animal rearing.



(v) Provision of water	(Prefabricated)		
	- Materials		
	- Labour	1600000/-	
	- Engine		
	- Piping		
	- Water tanks	2000000/-	
(vi) Power generation	- Generator		
	- Wiring	1000000/-	
(vii) Construction of dipping facilities (cattle dip)		3000000/-	
(viii) Purchase of Breeding stock (for upgrading)			
	200 heads of cross/.local breed	22275/-	4455000/-
	10 heads pure breed bulls @60,000	60000/-	600000/-
(ix) A.I Services			
	- Semen importation		
	- Purchase of storage facilities (Deep freezers/Fridge)		
	- Purchase of hormones (Oestrogen & Progesterone) for synchronization	500000/-	
(x) Motorbike			
<b>TOTAL COST</b>		<b>20,655,000/-</b>	

## **(B) FEEDS AND FEEDING**

### **(1) Pastures and Fodder Farm**

This is aimed at supplying forage to the breeders farm unit stock.

(i) Hiring 25 acres land for 10yrs @ 2500/-		
2500/- x 25acres x 10yrs	625000/-	
(ii) Fencing and paddocking	250000/-	
(iii) Machinery for land preparation etc		
(Tractor and implements -	2000000/-	
- Plough - 100000/-		
- Harrow - 200000/-		
- Trailer - 250000/-		
- Fodder Bailers - 50000/-		
- Fodder Rollers - 50000/-		
- Chaff Cutter - 50000/-	700000/-	
Total	2,700,000/-	

Cost of operation during pasture establishment:-

(iv) Pasture and fodder Inputs	500000/-
includes:-	
- Seeds (maize, legumes, pastures)	

- Fertilizer
- Vegetative cultivars (Napier)
- Ploughing
- Re-ploughing
- Harrowing
- Sowing
- Weeding
- Top dressing
- Legume inoculators

**TOTAL COST**

**4,075,000/-**

**(b) Animal feeds processing plant**

This is aimed at providing animal feed rations for dairy supplementation. This is because currently the dairy nutritional demands have not been adequately catered for, as the feed rations are not readily available. Also the price of these feed rations is too high for the local farmers.

Hence the establishment of this processing plant readily to provide feed rations at recommendable & affordable prices. Besides there is a lot of food wastage in these communities. This surplus of food resources, such as maize, sunflower, etc., combines well in the formulation of Animal feed rations, and therefore needs to be properly utilized and conserved.

Consequently, the processing plant will offer employment opportunities to the local community. This will improve their economic status and therefore their living standards.

At community level there shall be farmers and any other interested parties contracted to supply the raw materials to the processing plant. The Mission shall carry out the processing activity, packing, storage and supply/marketing of the processed feeds to the communities (project area and the surrounding) and other extended areas.

The Mission shall construct large silos for grain storage during the harvesting season. The stored grain will supply the raw materials out of season to keep the processing plant in constant work.

**Costs**

- Acquisition of 5 acres of land @ 120000/-		600,000/-
- Feed processing structure	}	
- Feed processing mills/machines	}	
- Feed additives, cereal grains, molasses, fats, oils etc	}	1,000000/-
- Feed packaging	}	
- Transport - 6 motorbikes @150,000		900,000
- 1 pick-up vehicle –Transportation & collection		2,000,000
- Construction of silos		1,000,000

**Total Cost**

**5,500,000**

**(C) MILK PROCESSING AND MARKETING LEVEL**

This shall be established in Kimilili Town because it is centrally positioned and easily accessible by the milk suppliers (Availability of rural access and classified roads)

As the community will have been in a position to produce plenty of milk, there will be sufficient for domestic consumption plus surplus milk to deliver for processing and marketing.

This level is aimed at milk collection from project farmers and other surrounding dairy farmers as a way of loan repayment. This is to make dairying a stable income generating activity, and initiating the community farmers into daily routine responsibilities.

#### Costs.

(i) Purchase of 1 acre of land (8 plots @ 80,000/-	640,000/-
(ii) Building and construction (Gordowns, stores, Offices)	5,000,000/-
(iii) Machines (Cooler, separators, Boiler, Generators, Pasteurising, Packaging)	5,000,000/-
(iv) Packing and other supplies	500,000/-
(v) Purchase of a lorry (Transportation)	6,000,000/-
(vi) Purchase of a van (refrigerated)	2,000,000/-
(vii) Purchase of Office equipment (computers, furniture etc)	500,000/-
<b>Total Cost</b>	<b>19,640,000/-</b>

#### REVENUE EXPENDITURE INCURRED DURING PROJECT ESTABLISHMENT PERIOD

- In calf period of heifers	9 months
- Growing period (foundation stock)	18 months
- In calf period of offspring	9 months
Total Duration	36 months

#### SALARIES

3 livestock production @ 10000/- Technicians	10000/- x 3 x 36	=	1080000/-
3 Animal Health @ 10000/- Technicians	10000/- x 3 x 36	=	1080000/-
1 livestock Officer @ 10000/-	10000/- x 36	=	360000/-
1 Livestock Production @ 15000 Manager	15000 x 36	=	540000/-
3 Watchmen @ 4,500/-	4500 x 3 x 36	=	486000/-
2 Foremen @ 6,000/-	6000 x 2 x 36	=	432000/-
2 Mechanics @ 7000/-	7000 x 2 x 36	=	504000/-
Drivers - 1 Lorry driver @ 6500/-	6500 x 36	=	234000/-
1 Tractor driver @ 5000/-	5000 x 36	=	180000/-

**TOTAL**

**4,896,000/-**

**BUDGET SUMMARY**

1. Breeders unit	-	Kshs.20,655,000/-
2. Feeds and Feeding		
(i) Pasture & Fodder Farm		Kshs. 4,075,000/-
(ii) Animal feeds processing plant-		Kshs. 5,500,000/-
3. Milk Processing and Marketing plant	-	Kshs.19,640,000/-
4. Revenue Expenditure	-	Kshs. 4,896,000/-

**GRAND TOTAL COST**

**Kshs. 54,766,000/-**