The Minimum Integrated Household Agricultural Package (MIHAP)

For self-sufficiency in small farm households in Eritrea

An initiative developed and implemented by
the Ministry of Agriculture of the State of Eritrea

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Background

In Eritrea, agriculture plays a central role in economic development. Boosting farm productivity will provide food and nutrition security, income and employment for the farm households, as well as marketable surplus for urban dwellers, and eventually export/ cash crop production for industry and external trade. Increases in farm productivity are clearly central to economic growth and to the well-being of the population for the foreseeable future. Food and nutrition security and poverty alleviation are always major concerns and new methods must be introduced in order to tackle these concerns.

Since, an estimated 60-70% of the population is dependent on subsistence agriculture; one of the cornerstones of economic development in Eritrea is the improvement in farm productivity and income through diversification of high value commodities and improved technologies. Productivity at farm level has historically been low because of the predominance of subsistence farming, unpredictable rainfall and drought, lack of modern technologies and inputs. Food production has not kept pace with the needs of the country.

Farm production systems in Eritrea are varied; and include rainfed cereal/pulses system, irrigated horticulture system, semi-commercial peri-urban livestock (dairy/poultry), agro-pastoralist system, nomadic-pastoralist system, semi sedentary, crop/livestock mixed system, as well as some commercial farming. The majority of the Eritrean farmers in the highlands practice rain fed crop production along small number of livestock (small ruminants and oxen for ploughing). However, its contribution to satisfy the increasing food requirement at the household level has been very limited. Indeed farmers generally produce about 60-70% of their annual food requirements except for good years which can be much higher. The remaining 30-40% is covered by selling their animals or through other activities such as growing horticultural crops, masonry work and working as daily laborers in nearby towns etc.

MIHAP: the concept and objectives

To alleviate this problem, the Ministry of Agriculture has introduced a Minimum Integrated Household Agricultural Package whereby each household/ family will acquire one improved cross-breed dairy cow or 6 shoats (to be kept inside and fed through cut and carry), 25 chicken, 2 bee hives, a vegetable plot and 20 trees (10 fruit trees, 5 leguminous trees like moringa, leucinia, pigeon pea etc. as feed supplement to the cow, 5 trees for fire wood) in addition to the land used for crop production.

This package has the potential to improve the living conditions of the family and satisfy their food and nutrition requirements for the respective family and four others; as well as providing extra money by selling surplus products. The crucial issue is for farmers to concentrate on one improved dairy cow which can provide a minimum of 10-15 liters per day milk instead of having 3-5 milking cows with low productivity. The family will consume 20% of the milk and sell the rest. The dung produced will also help to improve soil fertility of their land. The other component i.e. the backyard poultry is adaptable to

the Eritrean condition and will not need special care or attention in their feeding (as they are free range). They are not very susceptible to diseases and can be easily handled. Eggs produced will provide tasty nutritious food for the family and the rest can be sold to other families. Eggs produced by local hen breeds command a premium price because of their quality. Honey is a very nutritious and organic food which can be used by the family and the huge surplus can be easily sold. Vegetables and fruits which contribute the bulk of the nutrition are also an integral part of the package.

On-farm milk processing (Village or administrative village level milk processing)

Adding value to small scale dairy production is also a powerful tool for reducing poverty, raising nutritional levels and improving the livelihoods of farm households and rural communities. The on-farm or small scale processing of milk at a village level for the production of Artisan Dairy Products can be a way to add value to milk production. It can also create flexibility and provide a buffer to cyclical changes in supply and demand.

With fluctuating milk prices, many farmers desire a more reliable, less cyclical income stream. Many dairy producers consider on-farm processing in order to add-value to the milk produced on their farms by way of, cheese and yogurt production. Butter is already produced in Eritrea on many small dairy farms during the fasting seasons. Generally,

adding value to a product consists of transforming a product to an alternative form that will bring about more flexibility and a better balance between supply and demand as well as increased income. Through this process, consumers receive a high quality product, and farmers receive a new revenue stream.

Expected results

The decision to enter to a new venture such as this should not be taken lightly and like many small businesses, the failure rate for dairy on-farm processing enterprises could be high. Thus in this package the processing will be considered at village or administrative kebabi level rather than at individual farm level. While producers may be attracted to the potential for increased value of their milk, consumers have to actually purchase the product before this extra income is realized. Moreover, the successful operation of dairy on-farm village level processing venture requires the farmers to acquire basic knowledge and skills in the following areas:

- Hygienic milk production and handling, quality control and testing
- Hygienic milk storage, preservation, transportation etc.
- Processing and packaging
- Maintenance of milk handling and cooling equipment.

The idea is to go to the basics and look at what people traditionally do to sustain their households. Elements included in the MIHAP are often practiced already in Eritrean rural households (dairy cow, chicken, beekeeping, wood and non wood trees, improved stove, etc.)

Households selected for this package are those who have a small plot of land around water points. The package offers the household both economic benefits as well as social benefits in terms of reducing burdens on women. The initial investment cost per household is high in year one, but the payback period is a maximum of two years. The idea to have a carefully designed modular approach mainly aimed at promoting grass-root-level-agro-development activities at sub-zoba, kebabi and village level is a very good one.

Achievement indicators

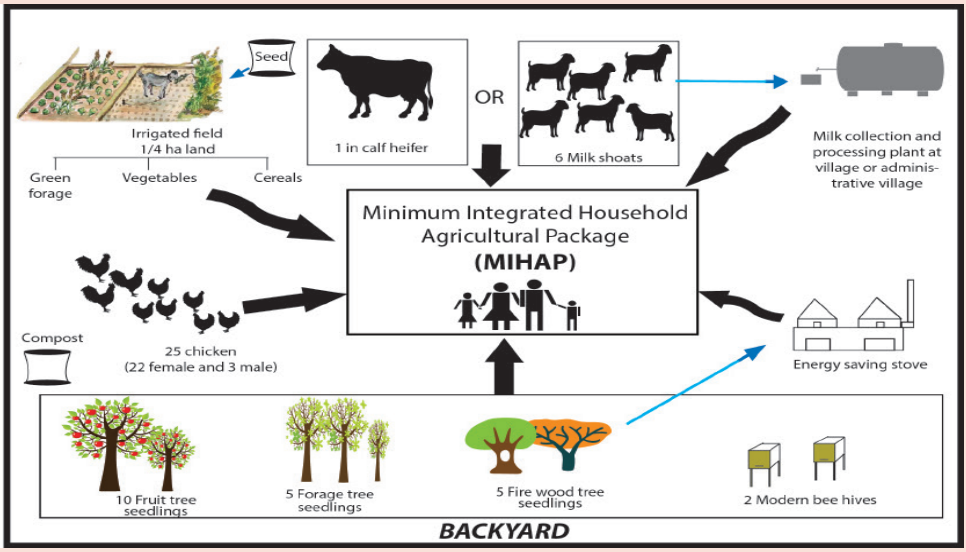
Besides securing household food and nutrition needs, farmers involved in this package and small-scale producers could also play a great role in increasing the supply of agricultural products to consumers as well as helping to stabilize markets. In order to further enhance these development, households could be organized into cooperatives which would also help to promote the whole concept.

This package will ultimately improve the living conditions of the family and satisfy their needs as well as providing extra money by selling surplus products.

If implemented properly, the MIHAP has the capacity to enable farm families become self-sufficient, provide food, nutrition and financial security at household and community level; and provide worthwhile employment for family members and rural communities.

Indicators of the MIHAP can be summarized as follows:

- Reduced number of persons living below poverty line in targeted areas
- Increased income of targeted (beneficiary) households as compared to baseline



- Reduced prevalence of underweight and malnourished children in targeted areas
- Increased number of families having fulfilled minimum household dietary feeding.

Main activities

The concept of the Minimum Integrated Household Agricultural Package needs to be understood by all stakeholders and the following core components need to be systematically put in place if the programme is to be sustainable and have national relevance.

1. This package is community based, around irrigation projects where drip/sprinkler irrigation should be used in order to provide an enhanced prospect of sustainability in the long term.

2. Each individual farmer is expected to have about 0.25 ha which will be utilized as follows:-

a. 1000 m^2 for green forage production
b. 1000 m^2 for food crop production
c. 500 m^2 for vegetable production

3. Each farm household will be provided with

I. one dairy cow or 6 shoats
II. 25 chicks (22 females and 3 males)
III. 2 bee hives
IV . 20 trees (10 fruit trees: 5 trees to provide supplementary forage and 5 trees for firewood)

4. It is envisaged that this package will provide sufficient food and nutrition for the participating farm household as well as sufficient supplies for 4 other families.

5. Farmers field school shall be established as part of each project to facilitate efficient technology adoption and experience sharing within the project and in the wider rural community.

Expected output

• Assuming that 95% of the heifers/cows calf and each dairy animal produce around 10 litres of milk per day, about 2,100 litres of milk can be produced in 210 days. If 2 litres of milk is consumed at home (given to calves and children), the remaining 8 litres is expected to reach market. Hence the amount of milk that could be collected and delivered to consumers on daily basis from the milking cow is 8 litres. If the milk is sold for 20 Nakfa per litre, about 33,600 Nakfa will be earned per year. Since the production cost is roughly 50 percent, each farmer would have a net gain of 16,800.00 Nakfa or 1120 USD per year.

• From the 22 female chicken supplied to each household, 20 chicken are expected to survive. It is assumed that 75% of them will start laying eggs at the age of 5.5 months and will continue to provide eggs for 210 days per year. Hence $20 \text{ X } 75\% \text{ X } 210 = 3150$ eggs will be available in one year. If the family consumes 3 eggs per day, 12 eggs are sold on a daily basis. In 210 days, 2520 eggs are sold at a rate of 3 Nakfa per egg which amounts to 7,560 Nakfa or 504 USD.

• From the two beehives supplied to each beneficiary, 50 kg of honey can be harvested per year. If the 10kg is consumed at home, 40 kgs of honey will be supplied to the market and each beneficiary can earn 8000 Nakfa per year assuming the price of a kilo of honey is 200 Nakfa.

• From the 500 m^2 of land each beneficiary will harvest variety of vegetables of a value of 800 Nakfa per one cycle. If we have an average of 2.5 cycles per year, the sales is 800*2.5 = 2000.00 Nakfa. It is assumed 100m^2 is enough for one family.

• From the 1000 m^2 of land sown with hybrid maize, each beneficiary will harvest 2 cycles per year. If 6 quintals per harvest is assumed, a total of 12 quintals (1.2 tons) will be harvested. And If 50% of the product is sold at 1500/ quintal, the beneficiary will get a total of 9,000.00 Nakfa per year.
• From the 1000 m^2 of land developed with forage crops, 4-7 tons (40-70 quintals) of fodder will be produced. This is adequate for the dairy cow and chicks for one year, on top of the other crop residues.

• From the 20 trees, each beneficiary will be able to harvest fruits, fodder and fire wood after 3-5 years. Of the 10 fruit trees, two are enough for the family. The produce from the other eight trees (25kg/ tree) will be sold to the market.
8 *25 = 200 kg*20 Nakfa/kg = 4000.00 Nakfa

Direct cash benefits

	Description	Net income per year (USD)	Net income per year (Nakfa)
1	Milk Sales	1120.00	16,800.00
2	Egg sales	504.00	7,560.00
3	Honey sales	667.00	10,005.00
4	Hybrid maize & vegetable sales	733.00	10,995.00
	Total	3,024.00	45,360.00

Each beneficiary household will earn a net of 3,024.00 USD or 45,360.00 Nakfa per year. This income is considered high when compared to the ordinary government employee's income or in general to the per capita of the country.

Budget consideration

Implementation phase (12 months for each individual community project)

Sr	Description	Unit	Units	Unit cost (USD)	Total cost (USD)
1	In-calf dairy heifer	No	1	3,000	3,000.00
2	Backyard chicken	"	25	7.00	175.00
3	Bee hives	"	2	375.00	750.00
4	Vegetable, forage, cereal seeds	Kg	5	10.00	50.00
5	Tree seedlings	No	20	3.75	25.00
	Total				4000.00

The total cost of establishing MIHAP for each beneficiary household is USD 4000.00 and the payback period is a maximum of two years.

If properly and sustainably implemented, this program will help Eritrea significantly in meeting the poverty and hunger eradication targets of the global Sustainable Development Goals (SDGs) before the set deadline in 2030.

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