

ESTABLISHING MORINGA BASED ECONOMIC DEVELOPMENT PROGRAM TO IMPROVE THE LIVELIHOOD OF RURAL WOMEN OF ETHIOPIA



Feasibility study of Organic Production System of Moringa stenopetala

CONTENTS

1. MAIN ISSUES	5
1.1. Biodiversity and “New Crops”: allies against malnutrition	5
1.2. Women	6
2. THE SOUTHERN REGION	7
2.1. Geography and Climate	7
2.2. The Rural Livelihood Zones	8
2.3. Goma-Gofa	8
2.3.1. Population Size and Distribution	9
2.3.2. Population Density	9
2.3.3. Age Structure	9
2.4. Nessuna voce di sommario trovata.	
2.4.1. Features of the Sector	16
2.5. Beneficiaries and Parties Involved	18
2.6. Problems to be Addressed	18
2.7. General Requirements for Organic Farming	19
3. PLANNED INTERVENTION	26
3.1. Site Description	26
3.2. Overall Objectives	27
3.3. Intervention Purpose	28
3.4. Intervention Results	28
3.5. Planned Activities	28
3.5.1. Provision of Moringa Organic Propagation Material	28
3.5.2. Laying-out of the Organic Production Scheme	29
3.5.3. Establishing and Cultivating Moringa Trees	29
3.5.4. Agricultural Intercropping and Rotations	29
3.5.5. On-farm Livestock Management	31
4. ASSUMPTIONS	32
4.1. Assumptions, Risks, and Limitations	32
4.2. Socio-cultural Aspects	
5. IMPLEMENTATION	33
5.1. Organization and Implementation Procedures	33
5.2. Cost Estimates	34
5.2.1. Investment Costs	34
5.2.2. Recurring Costs	35
5.2.3. Nursery Costs	36
5.2.4. Production Revenues	37
5.2.5. Tentative Cash-flow	38
5.3. Economic and Financial Considerations	39
1. REFERENCES	39

2. VALUE CHAIN	41
2.1. Main Features	41
2.2. Market Target Strategies	41
2.2.1. Raw Material Transformation	42
2.2.1.1. Seed Oil Production	46
2.3. Commercialization	47
3. MAIN FEATURES OF THE MORINGA MARKET	49
3.1. Background Situation	49
3.2. Vertically integrated system	50
3.3. Horizontally Diversified Trading	50
3.3.1. Supermarkets	51
3.3.2. Groceries	51
3.3.3. General Stores	52
4. INTERNATIONAL MARKETS	53
4.1. Global Trading	53
4.2. The European Market, an Overview	54
4.3. European Market Channels	55
4.4. End-Market Prices for Moringa <i>Oleifera</i>	55
4.5. Products Description	56
5. MARKET SEGMENTS TO TARGET	57
5.1. Food Supplements	57
5.2. Novel Food	57
5.3. European Market Perception	58
5.4. Interest in Organic and Fair Trade-Certified Moringa	59
5.5. Requirements for Moringa to be Allowed on the European Market	
5.6. Requirements for Niche Markets	60
6. QUALITY STANDARDS AND CERTIFICATIONS	62
7. COOPERATIVES IN AGRICULTURE	62
7.1. The Role of Agriculture Cooperatives	63
7.1.1. The Cooperatives Principals	63
7.1.2. Equity and Essential Issues of Ownership	64
7.1.3. Coop Members Equity Structure	65
7.2. The Wezeka Cooperative	65
7.2.1. Cooperative Organization and Administration	66
7.2.1.1. Juridical Features	66
7.2.1.2. Procedure for the Cooperative's Constitution and Registration	66
7.3. Cooperative Organization – Strategy	67
7.3.1. The Mission	67
7.3.2. The Vision	68
7.3.3. Objectives	68
7.3.4. Politics and Regulations	68
7.3.5. The Implementation Process	68
7.4. Requirements for Lease Financing	69

8. <u>WOMEN IN THE PROJECT CONTEXT</u>	69
8.1. Gender and Nutrition	70
8.2. Methodologies and Indicators in Gender Participatory Approach	71
8.3. Women at the Wezeka Cooperative	71
9. <u>MORINGA DEVELOPMENT OPPORTUNITIES AND CHALLENGES</u>	72
9.1. Opportunities	72
9.2. Challenges	73
10. <u>CONCLUSION AND RECOMMENDATIONS</u>	73
11. <u>REFERENCES</u>	74
ATTACHMENTS	75

1. Main Issues

1.1 Biodiversity and “New Crops”: allies against malnutrition

Plants biodiversity represents the primary source for food, feed, shelter, medicine and many other products and means that make life on Earth possible and enjoyable (WCMC, 1992; UNEP, 1995). The number of plant species used by humans around the world is only 1/3 of the number of species which generations of diverse cultures around the world have drawn upon to develop crops that would meet specific needs.

The centres of diversification of most cultivated species are known today (Zevet and de Wet, 1982) but for many other species of local importance, knowledge of the distribution of their genetic diversity and use patterns is still largely limited¹.

Increased impact reliance of major food crops has been accompanied by a shrinking of the food basket which humankind has been relying upon for generations (Prescott-Allen, 2006).

This nutritional paradox has its roots in the agricultural simplification, a process that favoured some crops instead of others on the basis of their comparative advantages for growing in a wider range of habitats, their simple cultivation requirements, easier processing and stability, tastes and so on (Ogle and Rivetti, 1995).

The shrinking of agriculture biodiversity has reduced both the intra- and inter-specific diversity of crops, increasing the level of vulnerability among users, in particular the poorer sections for which diversity is a necessity for survival rather than a choice.

Leading international research organizations, such as the Consultative Group on International Agriculture Research (CGIAR) successfully raised the interest of decision- makers.

This global “opening” towards underutilized crops is the result of a gradual change of attitude towards biodiversity and plant genetic resources by many countries. Instrumental in this awareness have been the 1992 Convention on Biological Diversity and the FAO International Technical Secretariat².

Since the needs and uses are mostly local, the action will therefore be local, and community based, with local mechanisms that support the deployment of useful diversity. Household “filières”, largely run by women and built in rural and forest areas typically around multiple uses of the same crop, should be improved. These chains, linking farmers up to final end-users, play a critical role in securing revenues to rural communities and thus fuelling the very mechanism that will maintain the diversity of these species in the field¹.

Moringa stenopetala is endemic to Southern Ethiopia and in North of Kenya and Eastern Somalia. It is an agro forestry tree in the field; a staple food for millions of people living in the Southern part of Ethiopia. The production can be characterized as informal and scattered, by small farmers and very limited private growers. The primary production and consumption of Moringa in Ethiopia is informal and very little attention is given to the production system and marketing and as such it is not even recorded as an important crop/plant/tree in the livelihood system of the community.

1 S. Padulosi, T. Hodjkin, J.T. Williams and N. Haq; IPGRI, Italy and ICUC, UK – Moringa and other highly nutritious plant resources: strategies, standards and markets for a better impact on nutrition in Africa – Accra, Ghana 16-18 November 2006.

2 Conference in Plant Genetic Resources for Food and Agriculture, held in Germany in 1996 (cifr. Activity 12: Promoting Development and Commercialization of Underutilized crops and species (UNEP, 1992), (FAO, 1996), (CFAR, 1999).

The Moringa Value Chain Project, which is the pilot phase of a more comprehensive program, aims at adding value to the organic cultivation of *Moringa stenopetala*, from production to processing and commercialization for national and European markets.

1.2. Women

Women are the nexus of agro-nutritional health through their roles as plants gatherers, home gardeners, plant domesticators, herbalists, medicinal plant collectors and seed custodians. Their knowledge of biodiversity and their value for meeting the food, fodder, fuel wood, medicine, clothing and shelter needs of their family, is crucial for securing the subsistence and development needs of the poor segment of society.

Women farmers perform up to 75% of farm labour, representing 70% of household food production in Ethiopia, but they typically produce 35% less than male farmers because they have lower levels of access to resources.

Actively involved in the household economy, women control consumption patterns and can use a wide diversity of plant species traded in the market for food and medicine.

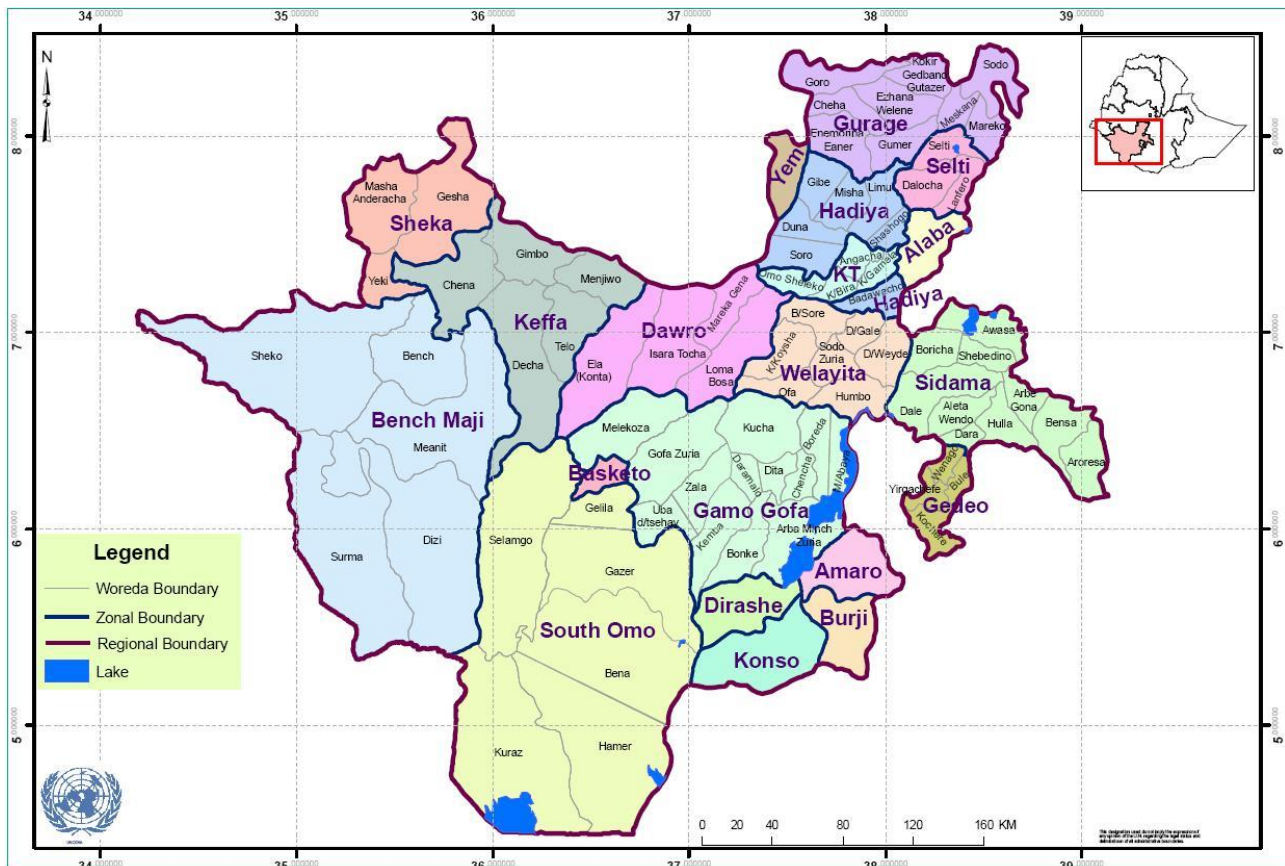
Women have different and complementary knowledge than men. They differ in their perception and thought process, their choice criteria, their preferences, needs, practices and uses of biological resources. They receive, organize, and transmit their knowledge and skills by different means.

Women are powerful agents of change and their leadership is critical in community revitalization and renewable natural resources management (CBD- 2013-UNEP).

MVC Project aims to add value to the role of women, from their traditional knowledge to new forms of capacity. The Project is aimed at identifying appropriate resources and technology to improve the production of local relevant crops, and to increase food and nutrition security.

The importance of gender equality and women's empowerment, particularly women's economic empowerment, is at the core of the UNIDO mandate. Enhancing the role of women as drivers of poverty reduction, promoters of food and nutrition security, as well as recognizing the link between gender equality and safeguarding of the environment, promotes inclusive and sustainable industrialization, and directly contributes to Sustainable Development Goals (SDG).

2. THE SOUTHERN REGION



2.1. Geography and Climate

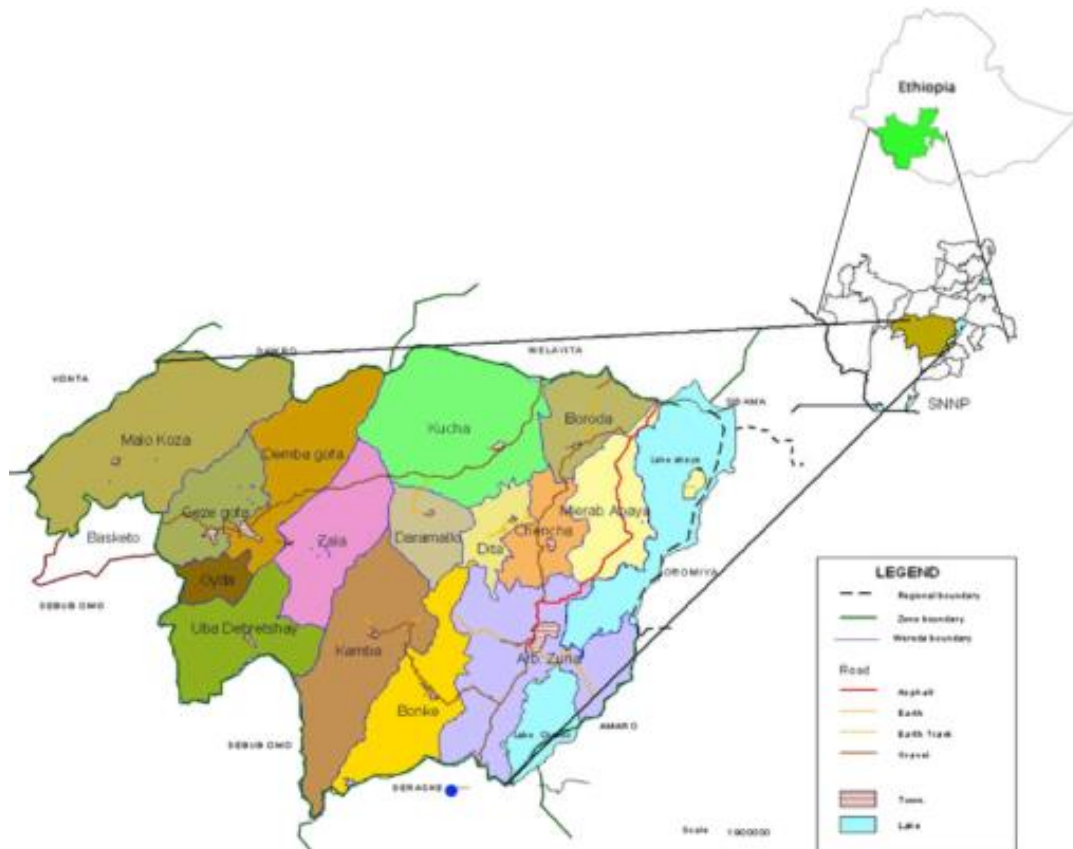
With a total land area of about 112,000 square kilometers, therefore some 10% of the area of Ethiopia, SNNPR extends west from the Rift Valley as it runs through Southern Ethiopia. The Rift Valley lakes, in a line from north-east to south-west, roughly mark the eastern border of the territory: Lakes Ziway, Awassa, Abiyata, Shala, Abaya, Chamo, Chew Bahir and finally on the border with Kenya, the northern tip of Lake Turkana into which flows the Omo River. That river is served by the biggest drainage pattern in the Region, entering from the north along the boundary between Wolayta and Dawro Administrative Zones and defining the northern-western boundary of Gamo Gofa Administrative Zone before the river enters the main valley in South Omo, with some drainage from Bench Maji. There are other more localised drainage areas, notably those serving the Bilate River which runs into Lake Abaya and the Weito River which runs into Chew Bahir.

The Region's cool highland terrains are not extensive, but they are densely populated. Notable highland areas are in Gurage and Hadyia Administrative Zone in the north-east, in Sidama and Gedeo Administrative Zones where they form a south-western leg of the Arsi-Bale massif, and in the Gamo and Gofa highlands of the centre-south-west. The dominant, temperate midlands are relatively wet or dry mainly depending on their altitude within the range of roughly 2500 to 1500 meters above sea level, and this has an effect on the relative success of enset (*Ensete ventricosum* / "False banana") or coffee production, to name two key products. The main lowland areas stretch to the south-west and

west, mainly in South Omo and Bench Maji Administrative Zones, and with their relatively high temperatures and low rainfalls they are the scene of agro-pastoralism. Elsewhere there are smaller areas of more arable land, for instance surrounding lakes Abaya and Chamo in the Humbo, Aeba Minch Zuria and Amaro Special Woredas and further south in Dirashe and Konso Special Woredas. But the relatively narrow Bilate river valley is more or less agro-pastoral lowland.

SNNPR is a region of relatively high rainfall by Ethiopian standards. Few Woreda reporting stations show under 1000mm of annual precipitation in the 30 years period of 1971-2000. Those that do are lowland areas such as the Hamer rangeland (601mm.) and the lowlands around Lake Abaya (around 900mm.) whilst Konso (609mm.) has the lowest rainfall for an arable area, and this is where a traditional technique of land terracing helps to conserve soil moisture. By contrast the highest rainfall is found in the north-western area of Masha Anderacha (2180mm.), Gesha (2004mm.), Yeki (1776mm.) and Bench (1735mm.). Elsewhere the Limu area scores high (1811mm.), as does the Gamo highland at Chencha (1704mm.). The range for most of the midland of the centre, north-east and east of the region, where the majority of the Region's population live, is between 1100mm. and 1500mm.

2.2. The Rural Livelihood Zones



2.2.1. Gamo – Gofa Maize and Root Crop Livelihood Zone

This is an extensive zone of hilly and undulating midland and upper lowland terrain. There is high food

insecurity due to a combination of factors: high population density, therefore small landholdings for most households; low soil fertility; frequent rainfall irregularities; endemic trypanosomiasis; relative isolation, with poor roads and market access, as well as poor coverage of health and education services. Less than one in five households is normally self-sufficient in staple food production. The food crops are maize, enset, sweet potatoes, taro, teff and yams. Enset and roots are important against losses of the less drought resistant maize. The primal need for food forces the poorer majority of households to cut their enset before it matures (after 4 years), so that two thirds of the potential food from the plant is lost. Although all wealth groups sell crops to some extent, none make as much as half of their annual earnings from this. It is livestock and butter sales that bring in some 20% of the annual cash earnings for the poor and very poor, and this is made possible by the system of caring for the stock of richer owners in return for a share of the milk and sometime the progeny. The very poor also gain about 20% of their income from selling firewood and collecting grasses. However, by far the main source of cash for all the poorer households is casual employment, including migrant work on state farms in Jinka, Awash, Shashamene and Ziway³.

2.2.2. Population size and distribution

According to 1999 E.C National population and Housing census results, the total population size of the region was 14,945,992. Based on this, with an average annual growth rate of 2.9 %, the region's population size was projected and estimated to be 16,825,392 in 2010/2011 of which 89.3% residing in rural areas while the remaining 10.7 % inhabiting urban areas. Regarding population distribution, in the year 2010/2011 only 5 zones of a population between 1 and 3.3 million constituted 57% of the region population³.

The SNNPR Nations Nationalities Institute of Study is responsible for conducting a research on the region's nationalities, culture, language and history. According to the Institute, the ethnic groups are classified into the major language families called Cushitic, Omotic, Nilo-Saharan and Semitic. These major Ethnic groups are residing in their own administrative geographical areas /zones, with special Woredas or Woedas having a unique language, culture and other social values. In general, Omotic and Cushitic are accounted for 48% and 30% of the total 56 Ethnic groups respectively, while the remaining 22 % belong to Nilo-Saharan and Semitic Ethnic groups.

2.2.3. Population Density

Population density can be defined as the average number of inhabitants per square km. The total size of the region's population in 2003 was estimated to be 16,825,392, while the total area of the region (109,015 Km²) accounts for 20% of the total national area. Hence in 2003 the crude population density of the region was 154 inhabitants per square km.

There is a remarkable variation in population density from one zone to another. The most densely populated zone of the region is Gedeo (707p/km²) followed by Kambata-Tembaro (567p/km²), whilst the least populated zone is Debub Omo (28p/km²) followed by Bench Maji (38p/km²).

³ From SNNPR, BoFED, Annual Statistical Abstract 2003 E.C.

2.2.4. Age Structure

Southern Nations Nationalities and Peoples region, like other regions of Ethiopia, has a youthful age structure. According to the projected population of CSA, in 2011 about 48% of the population was under age 15 and the elderly (65+) accounts for 2%, totalling 50% of the population which is economically unproductive. The remaining belongs to working age population (aged 15-64) and accounts for about 50% of the total region's population.

The population pyramid of SNNPR has a broad base that implies a very large proportion of the population belongs to younger age groups. The pyramid is the result of very high fertility since new births are naturally added to the bottom, producing a broad-based age and sex distribution.

3. ORGANIC PRODUCTION SYSTEM OF MORINGA STENOPETALA

Feasibility Study at Arba Minch Zuria Woreda, Wezeka Kebele Pilot Demonstration Plot

3.1. Abstracts

The present study investigates the feasibility of establishing a *Moringa stenopetala* organic production system over 30 ha of land at Wezeka Kebele, Arba Minch Zuria Woreda, Gamo Gofa Zone, organised and managed according to general standards applied for national and international organic certification, meant to facilitate / create increased market opportunities for Moringa commercialisation, improve household food security and representing a sustainable land-use model for out-growers.

The purpose of the intervention is to ascertain the level to which both the farming community and consumers may benefit (economically, environmentally, physically and from a nutritional point of view) from the implementation of an integrated resource utilisation system designed to optimise land, plants, and animal interactions, thus satisfying human needs at both ends of the value chain while sustaining / enhancing the quality of the environment for future generations.

Such enterprise will demonstrate viability of organic Moringa production by a Public Private Partnership between a local resident cooperative and Woreda Administration, able to efficiently participate to the Moringa Value Chain initiative as a mean of adding-value to Moringa and other local agricultural products.

The foreseen system considers a local resident cooperative established with MVC Development Program supporting the scheme for organic crop production in return for tendering Moringa trees. Fresh products (leaves and seeds) will be sold locally to the entity running the process and BoANR, jointly running the productive process under an agro-forestry scheme, with individual cooperative members within the plant being established at the Wezeka Kebele Moringa pilot project site. A Right'Use Contract will be subscribed between BoANR and the Wezeka Cooperative (formed by the 110 beneficiaries; the appropriate economic structure shall be suggested to ensure the sustainability

of the project and the benefit of the entire communities).

3.2. Background

3.2.1. Study Context

The present study on organic Moringa production is required under the Consultant's Terms of Reference, in order to pave the way for facilitating / creating marketing opportunities and international certification for Moringa products and takes place within the framework of the Moringa Value Chain Project implemented by UNIDO with AICS (Italian Agency for Development Cooperation) financing.

According to the Project's Interim Progress Report of July 2017, in its work plan for the months of August to December 2017, the preparation of a Feasibility Study on Moringa Organic Production is seen as one of the main Project activities (together with the development of production and product standards, definition of Moringa value chain, and training), primarily needed for furnishing a reflection on new Project priorities in the present initial pilot phase.

Local Woreda Authorities, with Project support, have lately endeavoured to identify, secure, and start developing a first portion of some 5 ha within an allocated area of about 30 ha, placed on the western shore of Lake Chamo, pertaining to Wezeka Kebele, Gamo Gofa Zone in Arba Minch Zuria Woreda, south of Arba Minch city, which has been set aside for the establishment of a Moringa nursery, block plantations, and a pilot Moringa processing line for the production of oil, leaf powder and tea, as part of its field activities. It is within the above estate that the present proposal for Moringa organic cultivation has been provisionally located.

In the same Kebele, 110 beneficiaries mainly constituted by women, have undergone social coaching and basic training in the subjects of nursery operations, Moringa production and processing, and value chain. It is assumed that such labour, together with further personnel that will be trained during the remaining pilot phase of the Project's lifetime will constitute the nucleus of the workforce to be considered in the framework of the present feasibility simulation.

3.2.2. *Moringa stenopetala*

3.2.2.1. Botanical description, adaptation, and ecological distribution

Moringa stenopetala belongs to the Moringaceae family, represented by a single genus. The genus Moringa is represented by 14 different species to which *Moringa stenopetala* belongs.

Northeast tropical Africa is a centre of endemism and diversity to the genus, however Mark 1998 and Edwards et al., 2000, stated that the taxonomic position of the family is not clear. It has some features similar to those of Brassicaceae and Capparidaceae but the seed structure does not agree with either of the above families. Pollen studies have not provided any other suggestions and recent molecular

studies have leaned towards a relationship with the Carricaceae. This indicates that the taxonomic position of the family is not yet settled and is open for further research. Its seed physiology has not yet been studied in the tropics in general and Ethiopian in particular (Asian J. Applied Sci., 2011). According to Edwards et al., (2000) *Moringa stenopetala* is a tree 6-12 m. tall, with a trunk about 60cm in diameter at breast height, a crown strongly branched sometimes with several branches, a thick base, a white and pale grey or silvery smooth bark, a soft wood, and leaves up to 55cm long, with a pubescent and dense inflorescence with many flowered panicles 60cm long.

The genus *stenopetala* is known by different vernacular names such as Shiferaw (Am), Aleko, Alike, Halaco (Gam/Wol), Kallanki (Ben), Halako (Bur), Cabbage tree (Engl) (Edwards et al., 2000) (Dechasa, 1995; Demeulenaere 2001).

The genus follows the distribution pathway from Rajasthan (India) (Mark, 1998). The habitat where the genus occurs in Ethiopia as summarized from the herbarium vouchers of the national herbarium includes: rocky areas along rivers, dry scrub land, Acacia-Commiphora bush land on grey, alluvial soil and in cultivation around villages. *Moringa stenopetala* is cultivated in terrace fields, gardens and small towns (Edwards et al., 2000; Endeshaw, 2003).

The National herbarium has few collections of Moringaceae; the overall collection was from Gamo Gofa (Endeshaw, 2003). There are small seed collections of Moringa species at the Institute of Biodiversity Conservation and Research from Gamo Gofa: However, the viability of the seeds has not yet been tested. There is no information documented on *Moringa stenopetala* localities in the eastern and northern parts of Ethiopia. It is not clear whether this was due to a lack of exploration in the area or to the absence of the species in the area (Edwards, 2003).

Moringa stenopetala grows naturally in the acacia *Tortilis-Deloni* sp. vegetation-complex. This type of vegetation is often found in well-drained soils at altitudes of 900-1200 m. The species is quite drought resistant and is therefore particularly suitable for dry regions, as it can be grown using rain water without expensive irrigation techniques. In southern Ethiopia, it has been found in areas of annual rain ranging between 500-1400mm. Cold temperatures are a limiting factor for the cultivation of the specie in Ethiopia because it does not tolerate frost (Moges, 2004).

Origin:

Moringa stenopetala is often referred to as African Moringa tree, because it is native only to southern Ethiopia and Northern Kenya (Mark, 1998). Though it grows in many other parts of the tropics, it is not as widely known as its close relative, *Moringa oleifera*.

Uses:

The edible parts are exceptionally nutritious (Ram, 1994; Jiru et al., 2006). The leaves are one of the best vegetable foods that can be found in the locality. All parts of the tree except the wood are edible, providing a highly nutritious food for both humans and animals. The flowers are a good source of nectar for honey bees and can be eaten or used to make a tea. The seeds are rich in oil sources for cooking and lubricant uses. Many parts of the plant have been used in medical preparations. The wood is very soft, useful for making low-grade firewood and poor-quality charcoal. Attracting attention in recent decades is the use of the dried, crushed seeds as a coagulant (Jahn, 1984; Ram, 1994). Even very muddy water can be cleared when crushed seeds are added. Solid matter and some bacteria will coagulate and sink to the bottom of a container. The clean water can then be poured off and boiled. It is reported that 100mg of crashed seeds clean 1 l. of muddy water (in India and localities East Africa (Gupta and Chaudhuri, 1992).

Among the various uses of Moringa, a few others are outlined below.⁴

Alley cropping/Intercropping:

With their rapid growth, long taproot, few lateral roots, minimal shade and large amount of biomass held of high protein content, Moringa trees are one of the best MPT (Multipurpose tree) candidates for use in alley cropping system. Traditionally, the species is grown in mixed multi-story stands with food crops. For instance, around Arba Minch, farmers plant in their home gardens around 5 (and sometimes up to 15) Moringa trees per 0.1 ha. Farmers practice permanent multi-storied cultivation with *Moringa stenopetala* at the uppermost level; papaya, coffee and bananas in the upper-middle level; cassava, maize and sugar cane in the lower-middle level and cotton and pepper in the lowest level.

Soil fertility:

Moringa leaves can be easily processed for their concentration of cytokines to replace chemical fertilizers which are harmful to the long-term health of soil. It is important that these simple advances in farming technology continue to spread throughout the developing countries whose life depend on agricultural export will benefit greatly from small advances in agricultural innovations and natural alternatives to industrial farming practices.

Organic soil characteristics:

The soil feature is greatly influenced by the presence of *Moringa stenopetala* on farm land which is mainly due to the organic debris from the tree (leaves and pods). It can fit very well as a candidate crop for organic cultivation and can also conclude that organic *Moringa stenopetala* production is feasible and sustainable economically as well as socially in the present context of reducing pollution of natural resources and cost of farm production. The deep root systems of *Moringa stenopetala* bring important quantities of minerals from the depth to enrich the surface layer through litter fall. The mineral elements are returned to the soil in fruit, dead wood and decomposition of roots. The seed cake, once removed of alkaloid and saponin content can be used as nitrogen-rich plant fertilizer.

Use as Plant Growth Enhancer:

Lab experimentation has shown that Moringa spray had a wide range of beneficial effects on plant crops. Specifically, Moringa leaves contain healthy amount of cytokines, which are naturally occurring plant hormones. Cytokinins stimulates cytokinesis, or cell division, in the shoots and roots of plants. The effects of the spray results in the accelerated growth of young plants. The production of Grow enhancers considered to be profitable if the high density moringa plantation for stabilized juices production is taken in consideration.

Animal feed:

Leaves are readily eaten by cattle, sheep, goats, pigs, rabbits, and fish. *Moringa stenopetala* produces an excellent fodder, as it is reported by many Authors. The tree is a great indigenous source of highly digestive proteins, calcium, iron and multivitamins, which are essential for weight gain and increase in milk production.

Fertilizer:

The seed cake, although unsuitable as animal feed without treatment to remove the alkaloid and

4 Price, 1985; CWS, 2000; Edwards et al., 2000.

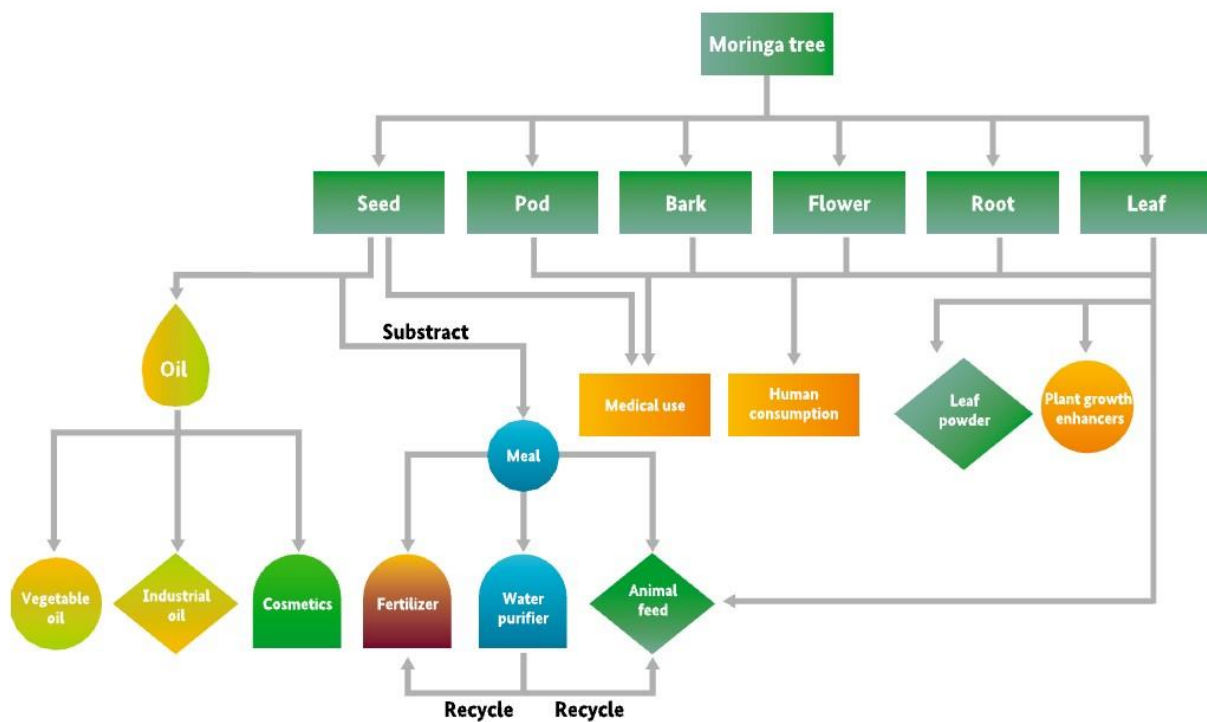
saponin content, can be used as a nitrogen-rich plant fertilizer.

Gum:

The gum produced from a cut tree trunk has been used in calico printing, in making medicines and as a bland-tasting condiment.

Honey purifier:

Powdered seeds can be used to purify honey without boiling. Seed powder can also be used to purify sugarcane juice.



Overview of products stemming from the Moringa tree

3.2.2.2. Nutritional Values

In developing countries, Moringa trees have been used to combat malnutrition, especially among infants and nursing mothers. The young leaves can be eaten fresh, cooked or stored as dried powder for many months without refrigeration, and without loss of nutritional value. The plant is a promising food source in the tropics because the tree retains full green leaves at the end of the dry season when other food sources are typically scarce. According to Optima of Africa Ltd, (a company involved in harnessing the tree in Tanzania), 25 g. daily of Moringa leaf powder will give a child the following recommended daily diets; protein 42%, calcium 125%, magnesium 61%, potassium 41%, iron 71%, vitamin A 272% and vitamin C 22% (Donovan, 2007). These percentages are considered outstanding, being available when even other food sources are scarce.

Jim et al. (2006) reported that for a child aged 1-3 a 100g serving of fresh leaves would provide all his iron and half his protein needs, as well as important supplies of potassium, B complex, vitamins copper and essential amino acids. As little as 20g of fresh leaves would provide a child with all the

vitamins A and C it needs.

For pregnant and breast-feeding women, Moringa leaves and pods can do much to preserve the mother's health and pass on strength to the foetus and nursing child. Just 20g of fresh leaves will satisfy all her daily requirements of Vitamin C. One portion of leaves could provide a woman with over a third of her daily needs of calcium and give her important quantities of iron, protein, copper, sulphur and vitamin B.

Nutrition experts recommend that proteins (or amino acids) should account 10-15% of the calories in a balanced diet, although requirements for protein are affected by age, health, weight and other factors. Generally, a normal adult requires approximately 0.36g of protein per pound of body weight, or 0.8g of good protein per kg. That makes a total of 50-80g of daily proteins that are made up of amino acids. There are 20 amino acids present in the human body; of those, nine are known to be essential and have to be supplied from diet since the human body cannot synthesize them, as it does with the other 11 amino acids. Few foods are known to contain all essential amino acids. The nine-essential amino-acids are: histidine, isoleucine, leucine, lysine, methionine, phenylalanine, threonine, tryptophan and valine. Histidine is considered essential for children and babies.

It is commonly said that Moringa leaves contain four times more vitamin A than carrots, four times more calcium than milk, three times more iron than spinach, seven times more vitamin C than oranges and three times more potassium than bananas, and that the protein quality of Moringa leaves compete that of milk and eggs.

Leaves and pods of *Moringa stenopetala* can be an extremely valuable source of nutrition for people of all ages.

3.3. National Policies on Organic Farming

Official government involvement in supporting organic farming started in 2003 with the establishment of a Task Force to outline an Ethiopian Organic Agriculture Regulation, designed to describe a general definition of organic production in the country and define the regulatory framework for growing and processing.

In March 2006, the Government issued Federal Negarit Gazeta: Proclamation No. 488/2006, to establish "The Ethiopian Organic Agriculture System" to support organic agriculture as a means to foster new market access, opening opportunities for better competencies in the international market, and facilitating conversions of Ethiopian agriculture while helping in conserving non-renewable natural resources.

The Ministry of Agriculture has subsequently appointed, as required, a Focal Person for Organic Agriculture, while a number of government institutions have started developing national organic standards and regulations for productive systems and particular products, or crops.

Subsequently a number of national and international NGOs were instrumental, through their projects supporting the organic sector development, in establishing and institutionalising the Ethiopian Association of Organic Agriculture (EAOA), today recognised as the umbrella organisation for supporting organic agriculture in Ethiopia. In 2007 EAOA developed a Strategic Plan with five pillars to guide its future activities to enhance the organic sector by networking actors and operators in the country.

Afterwards, in 2013 the Ethiopian Standard Agency (ESA) produced Ethiopian Standard ES ARS 751:2013 regarding the Code of Practice for Organic Products, following a similar document published by the African Regional Organisation for Standardisation, to which the present feasibility

study adheres.

At present there are no official local certification bodies / laboratory facilities operating in the country though EAOA is lobbying the government to appoint a local certification company under the Ethiopian Standard Authority (ESA), particularly for what concerns national organic certification.

International certification and inspection has however taken place in the country since the 90s, with the first company established and operating in Ethiopia being Ecocert, a French company. Today four international organisations are offering organic certifications: IMO, Ceres, BCS, and Control Union, with BCS certifying most of Ethiopian organic production according to ESA, European Commission Regulation (EC) No 889/2008 operating Council Regulation (EC) No 834/2007 on Organic Production and Labelling, US National Organic Program (NOP) or organic Japan Agriculture Standards (JAS).

Furthermore, for what specifically concerns Moringa safety / nutritional standards, being considered an herbal food supplement, its safe production and manufacturing will fall under the regulatory mandate of the Ethiopian Food, Medicine and Health Care Administration and Control Authority (EFMHACA), established by Regulation 189/2010 implementing Proclamation No. 661/2009, and Ethiopian Public Health Institute (EPHI).

It may therefore be assumed that besides the Organic Certification, Moringa leaves either prior to the manufacturing process (at farm gate as raw material) or before commercialisation as herbal tea or powdered into food supplement (finished product before entering the market) will be subject to inspection / quality control in terms of elements such macro and microscopic examination, presence of foreign organic matter, ash values, moisture content, extractive values, crude fibre, qualitative and quantitative chemical evaluation, chromatographic examination, and toxicological studies.

Finally, the Ethiopian Standards Agency (ESA) has lately produced standards for Moringa leaves, recently published, to which the Organic Farm production, once implemented, would eventually be called to comply with.

3.3.1. Features of the Sector

In 2008 the Swedish Society of Nature Conservation (SSNC) financed a Baseline Study of Organic Agriculture in Ethiopia, which at the time revealed the presence of about 137,000 ha of land under organic certification for export, managed by 110,000 small scale organic producers, with Oromia, SNNP, Amhara, and Tigray regions being the leading areas in term of organic productions.

Thus, Ethiopia has a significant organic agricultural sector and a high number of organic farmers. Today, about 170.000 smallholders, with farms comprising on average 1 ha, producing organic coffee (84%), sesame, honey and other products. 167,000 ha (0.5%) of the Ethiopian farmland is managed organically.

According to EAOA there are today 60 certified projects, involving about 140,000 smallholders. The organic sector has had a rapid growth, with about 12% increase each year. Lack of knowledge and infrastructure is however hampering a sustained export. EAOA keeps track of organic sales, and 15,000 tons of organically certified products were sold during 2014.

For what concerns organic Moringa products being made in Ethiopia, the following is a brief list of some national and international enterprises active in the sector:

Table 1. National and International enterprises of organic Moringa products

Enterprise	Position in Value Chain	Organic Products from Ethiopia
Addis Berries, Ethiopia	Tea packing and wholesale trader	Moringa powder (tea)
Fassica Foods, USA	Food Importer	Moringa tea
Moringreen, Germany	Warehousing, marketing, distribution	Moringa food, cosmetics, animal feed
Ecopia PLC, Ethiopia	Organic foods producer	Moringa tea
Hidase, Ethiopia	Producer, collector, marketing	Moringa Tea, powdered leaves

As a general feature, Moringa (either organically or conventionally produced) in Ethiopia largely appears not to be cultivated under specialised monocropping schemes, but rather as part of the traditional multi-cropping system being often associated, as a domesticated plant, to diverse grain, legumes, and vegetable crops usually grown on farmlands or in-home gardens.

In such conditions, while representing a food resource of a certain importance, the tree is also being utilised as a sun shelter to plants, people and homesteads; as a source of fuel and construction material; its by-products (pods) and leaves fed to cattle; and is customarily used for its medicinal value.

Traditionally, high-grade Moringa plants have been identified through mass selection, based on best phenotypes and their adaptation / general performance in local environmental conditions. Productive parameters in terms of yield of leaves and pods, more than having been directly targeted, have rather accidentally resulted as a consequence of the above selection process, and rest largely unknown.

Moringa stenopetala leaves (either powdered or consumed as such) are part of the traditional food intake (i.e. damaa) mainly in the southern portion of the country, where it is considered as an important food / supplement on which the rural family heavily relies.

Being utilised “based on availability”, Moringa leaves are mainly consumed at family level, and only when exceeding family needs would it then enter, often informally and in relatively limited quantities, the (mainly local) market. No wonder that in such a situation, market quantitative and qualitative information regarding this trade appears very difficult to obtain. Locally, 1kg of fresh leaves is sold at around 50 ETB, and fresh seed pods at 100 ETB; in Addis Ababa, a 1kg packet of Moringa leaves powder sells between 50 – 200 ETB.

Eventually, for what concern the limited quantities of organic powder / tea being commercialised by the above-mentioned companies, it can well be that the production may primarily come from Moringa individual trees that happen to be placed on organically certified farms (mainly producing other crops) rather than originating from specific organic Moringa plantations.

3.4. Beneficiaries and Parties Involved

As the project has already proceeded in selecting and training a total of 110 beneficiaries and 10 trainers, starting the process of training local villagers (predominantly women and young people) in organisation and empowerment, it is proposed that the said group, having received adequate training on Moringa production and processing techniques, good agricultural practices, good manufactured practices and sustainable use of products and by-products, be involved in the planned Moringa organic farming scheme, under direct supervision of a BoANR .

3.5. Problems to be addressed

Considerations on Moringa investment options:

Although *Moringa stenopetala* results perfectly naturalised within the Arba Minch bioclimatic zone, even allowing for somewhat relatively dried and hotter (2-3°C.) local conditions such as those which may be expected at lower elevations (1110 MASL) of Lake Chamo shores where the Moringa organic plantation is planned to be established, we may safely assume that *Moringa stenopetala* has optimal chances of being successfully established, and attain acceptable growth parameters either under rainfed or irrigated conditions. Due to above features, the species has indeed been recommended for such zones by the Ethiopian Forest Research Service, 1985.

Moringa stenopetala cannot however hope to compete with *Moringa oleifera* as far as growth parameters are concerned: the former is adapted to harsher environmental conditions, is rich in lignine and cellulose content, grows more slowly, reaches productive capacity later, and shows but a fraction of the latter productive capacity either in leaves or pods being annually produced.

This may also be due to the higher genetic variability encountered in *Moringa stenopetala* in comparison to *Moringa oleifera*.

Thus the risk of growing *Moringa stenopetala* under an organic production system in irrigated blocks as monoculture, apart from limited experiences being made in Ethiopia on most suited cultivation techniques of this kind, and high related production costs in terms of irrigation, fertilisation, and heavy labour requirements when compared with the overall productivity/ha/year, although optimising biomass production, do increases manifold the risk of the proposed investment being not rentable mainly because of excessive costs related to increased labour needs (over 130% compared with non-organic requirements), together with the system being scarcely suitable for organic farming.

Moringa stenopetala has competitive advantages in the project area over *oleifera* only when cultivated under mixed rainfed / localised irrigation conditions. This is within schemes that more strictly resemble traditional agroforestry systems, or intercropped with vegetables, grains, etc, with Moringa being established at a more extensive 3/4 x 4m or more spacing, allowing the plant sufficient land and specific role within the chosen agro-ecosystem constituted under appropriate organic farming protocols.

In these schemes, such as the one that is presently under consideration, the farmer will be asked to provide labour for tendering Moringa trees as a part of its normal daily workload (apart from planting

and harvesting and nursery's establishing, that will be remunerated), thus constituting an "in kind" contribution / compensation to investments being done under the proposed system, hence substantially decreasing the cost of organically produced Moringa, since these costs are mainly consisting of labour.

In fact, the species is already presently grown intercropped in mixed multi-story stands with food crops, and farmers therefore are aware of benefits and advantages of the system. Home gardens in Ethiopia (Arba Minch area) for instance, include at least 5, and sometimes up to 15 *Moringa stenopetala* trees per 0.1 ha.

In such instances farmers practice permanent multi-storeyed cultivation with *M. stenopetala* at the uppermost level, with *Carica papaya*, coffee in the upper-middle level, cassava, maize (but maize is very demanding on Nitrogen) and sugar cane in the lower-middle level and cotton and pepper in the lowest level. This incidentally also appears the system most suited for perspective organic farming as recommended by international and national standards, see following chapter for details.

Eventually, if the Feasibility Study must restrain itself, as per given ToRs, to the establishment of *Moringa stenopetala* species, then the preferred solution for cultivating this tree crop under organic farming will entail its farming within a bio-diverse productive method that may exploit the full potential of plant interaction: 2/3 of the land in an agro-forestry system for seeds production, and 1/3 of semi-intensive cultivation for leaves and pods production.

3.6. General Requirements for Organic Farming

Organic agriculture is considered as a holistic production management system which promotes biodiversity and biological activity, thus enhancing agro-ecosystem health while producing food; it is based on low use of external inputs and avoidance of artificial fertilisers and pesticides and is usually adapted to local systems.

Organic farming employs when possible farm inputs that can be re-used or recycled, are generated on-site and cause minimal pollution in local external environment. It specifically excludes all products and processes of genetic engineering and related technologies.

Thus, organic farming produces food diversity that is free from toxins, of high nutritional value and good shelf life, of a quality suitable for direct consumptions and small scale processing. It protects and promotes social, cultural, and biological diversity along with organisational systems and local level governance.

According to ARISE, India's largest organisation comprising organic farmers and organic farming promoters, organic farming basic rules include:

Table 2: some organic farming basic rules according to ARISA

- organic agriculture develops a viable and sustainable agro-ecosystem;
- all species should be adapted to local soils and climatic conditions;
- seed and plant material to be obtained from certified organic farms or generated on-farm;
- manual and animal driven implements should be used; highly mechanised equipment to be excluded;
- fertility of soil to be maintained and increased, and biological activity enriched;

- organic material to be returned to soil to retain humus; it must be a product of organic farms or other sources free from toxic substances, and farms must become self-sufficient in producing such organic material;
- pest and weed control to be resorted by rotation of crops, activating natural enemies, companion planting, predator management, mechanical / physical elimination. Botanical plant extracts (neem extract and cow urine) can be used, genetically engineered organisms of products not permitted;
- cultivation is to guard against pesticide/weedicide contamination and inorganic fertilisers leaked by other farms through irrigation run-off and drainage;
- soil loss through erosion and depletion of water resources to be consciously prevented;
- organic produce to be stored, transported, and conveyed to final consumer in its most original state; storage to ensure that care taken at cultivation is not lost by association with non-organic productions;
- transportation must be appropriate to the product so as to minimise damage;
- pests at storage and processing must be controlled by physical barriers, sound, air, and light. Temperature and atmospheric control is permissible. Botanical extracts and herbal pellets can be used for preservation;
- mixture of organic / non-organic products must be prevented during processing. Additives or substances altering organic nature of produce to be avoided;
- processing to be based on mechanised, physical and biological means;
- packaging must prevent material contact to diminish organic purity of produce. Biodegradable material to be preferred for packing. Waste / pollution generating packages to be discouraged;
- conformity to labour ILO conventions is required. Equal wages to be paid for equal tasks; Women and children rights not to be violated;
- Organic farming encourages employment, thus all steps in producing organically are to be employment-enhancing;
- direct sales by producers to be encouraged; intermediaries are to demonstrate that price benefits are transferred to producers;
- labelling must declare whether it is fully organic or from farm under conversion. Where geographic appellation is used, the product must be from that geographic region;
- showing ingredients is essential on labels of processed items, unless spices used are less than 2% on weight. Not obvious processing steps are to be indicated;

As far as baseline requirements of organic farming and processing are concerned, the following indications are furnished:

Soil:

is the living matter in which the seed is nurtured and the plant raised, it is therefore central to organic farming? This does not include hydroponics, aeroponics. It should be rich in organic content and biological activity. It should remain properly aerated and with good moisture retention capacity, free of toxins deriving from residues of chemicals, fertilisers, pesticides, etc. soil and water conservation measures should be integral part of organic farming practices.

Seed and planting material:

preferably of organic origin, locally adapted or indigenous having inherent pest and disease

resistance. Preferred are on-farm generated seed, or based on farmer-to-farmer exchanges, ensuring organic origin. Genetically modified materials not permitted.

Cropping pattern:

to actively promote best intra / inter specific diversity, follow proper rotation schedules and other cultural practices to minimise external inputs; use of trap crops and companion planting to be encouraged. Crop planning should keep a balance between different produce such as food, fodder, fibre, fuel, etc. Multipurpose crops intended to help self-sufficiency on such aspects to be encouraged.

Farm Inputs:

It should largely be produced on-site with low dependence on external inputs. It should maximise re-use and recycling of organic matter on the farm. It should employ animal traction when feasible.

Fertilising:

Organic manures and other organic nutrients, produced mainly on-farm should be utilised. Use of crop rotation, companion planting etc. should form the basis for mobilising synergistic effect towards nutrient supply. Care is to be taken to reduce forms of pollution such as nitrate leaching or nutrient losses through sun exposure, soil, water, and wind erosion, with thrust always given to maintain and improve.

Pests and Diseases:

Pests and diseases should be considered as inevitable in an organic farm, where cultivation should be carried out ensuring that losses from pests, diseases and weeds are minimised. Emphasis is primarily given to use crops and varieties well adapted to local environment, with control executed by balanced Manorial programme, fertile soils with high biological activity, rotations, companion planting, green manuring, mulching, early seedbed preparation, mechanical control, etc. Natural enemies of pests should be promoted and habitat management such as hedges, nesting sites, etc., encouraged.

Animal/Livestock Fodder:

Livestock is an important and integral component of organic farming to cater for needed agricultural farming operations and transport, and to convert green matter into soil nutrients, to the maximum extent possible. Fodder should be grown on-farm with minimal external sourcing, with animals being well kept in accordance with natural behavioural need of the same and given proper veterinary care.

Harvesting:

Should be done in accordance with general principles of organic farming; no synthetic chemicals to be allowed either before or after harvest to cater with market needs.

Storage and Preservation:

Should be done so as losses through pests and diseases are minimised, while ensuring nutritional quality of production. Synthetic chemicals or irradiation not permissible.

Processing:

Should utilise methods that enhance or maintain nutritional quality of the produce being processed.

Non-acceptable to introduce synthetic chemicals such as preservatives, anti-oxidants, emulsifiers, leavening or flavouring agents for increasing shelf-life, colour, taste or appearance. Process to be preferably adaptable and friendly towards small scale operations.

Labelling:

Should be clear and specific, without any attempt to mislead the consumer in terms of content, or nutritional value. It should describe the method of production if it is not totally organic. Products generated in farms under conversion to organic should likewise be suitably labelled.

Marketing:

Marketing strategies and practices will be in accordance and will respect intellectual property rights of traditional societies, or people in general. Local knowledge and practices utilised into the entire process to be recognised and prior informed consent of the collective be taken, in written form, before making claims of statements in the context of intellectual property.

It is accepted that organic practices require a period of conversion to give the operator time to adapt and refine production activities according to the productive environment. The system supporting production, in terms of soil, livestock, etc., may also need time to expel possible residues of chemicals and respond to the changed environment.

Table 3: Organic Farming Standards as proposed by ARISE, compatible with ESA Code of Practice for Organic Products

ORGANIC FARMING STANDARDS (ARISE, 2000)		
1. Choice of Crops and Varieties		
<p>General Principles:</p> <ul style="list-style-type: none"> - Seed and plant material should be certified organic. - Species and varieties adapted to soil and climatic conditions, and resistant to pests and diseases. - While choosing varieties, genetic diversity should be taken into consideration. 		<p>Standards:</p> <ul style="list-style-type: none"> - If certified organic seed and material not available, chemically untreated conventional materials shall be used. - In absence of alternatives chemically treated seed and planting stock may be used. - Certification programme defines conditions for exemptions and time limits for use of the above. - Use of genetically modified seed, transgenic stock not allowed.
2. Crop Rotations		

<p>General Principles:</p> <ul style="list-style-type: none"> - Rotation to be as varied as possible aimed at: maintain soil fertility, reduce nitrate leaching, weed, pest, and diseases. 	<p>Recommendations:</p> <ul style="list-style-type: none"> - Rotations to include legumes. - Perennial crops/plants as border plants be promoted. 	<p>Standards:</p> <ul style="list-style-type: none"> - Certification programme to require rotation of non-perennial crops to take into account pressure from insects, weeds, diseases and other pests, while maintaining or increasing soil organic matter, fertility, microbial activity and soil health.
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3. Fertilisation Policy

<p>General Principles:</p> <ul style="list-style-type: none"> - Sufficient organic material be returned to soil to increase/maintain fertility and biological activity. - Organic material produced on organic farm be the basis of manurial programme. - Organic manure production means such as compost units, biogas slurry, bio-dynamic manures etc., be set up on farm. - Use of improved manual and animal-driven implements be promoted. - Highly mechanised implements (tractors) be restricted. 	<p>Recommandations :</p> <ul style="list-style-type: none"> - fertilisation management to minimise nutrient losses. - Heavy metals and other pollutants be avoided. - Non-synthetic mineral fertilisers and introduced biological fertilisers to supplement and not replace for nutrient recycling. - Human faeces should consider absence of pollutants. Biogas from toilets to be encouraged. Transmission of pests, parasites etc be prevented. Organic manure not to contain pathogens. 	<p>Standards:</p> <ul style="list-style-type: none"> - organic material is the basis of the fertilisation programme. - Certification programme to set limits to amount of organic material being brought into the farm, considering local conditions and nature of crops. - Mineral fertilisers only used to supplement organic. Allowance to be made only when other organic fertility management has been optimised. - Mineral fertiliser to be supplied in natural composition and not rendered more soluble by chemical treatment. - Certification programme will restrict use of mineral potassium and magnesium fertilisers, trace elements, manure and fertilisers with high metal content or unwanted substances such as basic slag, rock phosphate and sewage sludge. - Chilean nitrate and synthetic nitrogenous fertilisers including urea are prohibited.
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4. Pest, Disease and Weed Management

<p>General Principles:</p> <ul style="list-style-type: none"> - organic farming to be executed ensuring losses from pest, diseases and weeds are minimised. To be promoted adapted crops and varieties, balanced manurial programme, fertile 	<p>Recommendations:</p> <ul style="list-style-type: none"> - pests etc be controlled by preventive techniques limiting pest development e.g. rotations, green manure, balanced manurial programme, early seedbed preparation and pre-drilling, mulching, and by mechanical control. 	<p>Standards:</p> <ul style="list-style-type: none"> - products for pests etc management prepared at farm from local plants, animals and microorganisms are permitted. - Mixed cultures of local microorganisms naturally occurring to be used for long-term eco-compatibility. - Equipment from conventional farming be cleaned and free from residues when used on organic areas.
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soils with high bio-activity, rotations, companion planting, green manures etc.	- Natural enemies of pests etc be protected and encouraged by habitat management (hedges, nesting sites).	- Use of synthetic herbicides, fungicides, insecticides and other pesticides be prohibited.
5. Pollution Control		
General Principles: - all measures to be taken to minimise pesticide contamination from outside and within farm by wind drift, drainage and irrigation.		
6. Soil and Water Conservation		
General Principles: - soil and water resources to be sustainably handled.	Recommendations: - relevant measures be taken to prevent erosion, soil salinization, excessive/improper use of water and its pollution either on surface or in the ground.	Standards: - land clearing by burning prohibited. Straw burning restricted to minimum. - measures be taken to prevent erosion. - excessive exploitation and depletion of water resources not allowed. - animal traction used if possible for farm operations. Measures be taken to prevent soil and water salinization.
7. Wild Vegetative Products		
General Principles: - the act of collection should positively contribute to maintenance of natural areas.	Recommendations: - when harvesting or gathering wild or forest products pay attention to maintenance and sustainability of ecosystem.	Standards: - wild harvested products to be certified organic if derived from stable and sustainable environment. Harvesting not to exceed sustainable yield or threaten plant or animal species existence. - produce be certified organic if derived from clearly defined collecting area not exposed to prohibited substances, certified as being sustainably utilised.

8. Labelling		
<p>General Principles:</p> <ul style="list-style-type: none"> - labelling to convey clear and accurate information on organic status of product. 	<p>Recommendations:</p> <ul style="list-style-type: none"> - if full standard requirements are fulfilled, product to be sold as “certified organic” or similar. - when used, conversion labels should be clearly different from full organic label. - products labels to list processing procedures influencing properties in a way not immediately obvious. - additional product information to be made available on request. <p>All components of additives and processing aids shall be cleared.</p> <ul style="list-style-type: none"> - ingredients derived from wild production should be declared as such. <p>Multi-ingredient products containing both certified wild and certified organic ingredients may be labelled “organic”.</p>	<p>Standards:</p> <p>Mixed products with some ingredient non-organic may be labelled as follows:</p> <ul style="list-style-type: none"> - “certified organic” if at least 95% ingredients are of certified organic origin. - 70% - 95% “made with organic ingredients” stating proportion of organic. - less than 70% may not be labelled organic, but indication that an ingredient is organic may appear in the list.

Permitted Organic Manure may include manures produced on the farm, such as compost, farmyard manure, biogas slurry, liquid manure, organic waste, green manure and straw manure, commercially available organic manures such as manure, liquid manure or slurry, straw and other plant material, processing bio-products as addition to farm manure like horn, bone, blood, meat meal, feather, waste fruit processing, or seaweed products, saw dust and bark shavings (not contaminated), peat with no synthetic additions, brought in supplementing mineral fertilisers as rock dusts, pulverised earth, lime fertilisers, natural rock phosphates, basic slag and potassium fertilisers having less than 3% chloride, or other miscellaneous such as water soluble seaweed extracts, or extracts and preparations from plants.

Permitted measures and substances for plant treatment and protection include, for biological control, crop rotation, mixed cropping and nutrient balance in soil, encouragement of natural enemies such as birds, lizards, predator mites, wasps, etc., insect traps, mechanical scarcer, traps, slug and snail barriers, non-synthetic repellents, botanical plant extracts such as neem, tobacco, garlic, onion, papaya etc., biodynamic preparations and methods; additional plant protection measures may include preparations which enhance resistance of plants and limit certain pests and diseases. Measures against animal pests include viral, fungal and bacterial (i.e. *Bacillus thuringiensis*) preparations, sterilised male insects, pyrethrum products, use of storage protections, quassia wood tea or broth, vegetable oil emulsions, soft soap/potassium salts of fatty acids, calcium chloride, or, as measures against fungal diseases, wettable sulphur in combination with bentonite, waterglass, rock dust, lime sulphur, copper for emergencies only, at the rate of 3 kg/ha/year, coffee, gelatine, ethyl alcohol, diatomaceous earth, neem.

Finally, parameters for farm certification include soil analysis such as pH and electro conductivity,

water holding capacity, texture, nitrogen, phosphate and potash, microbial population, earthworm density and diversity, toxic residues and presence of trace elements, while water analysis will include definition of main physical and chemical parameters.

4. PLANNED INTERVENTION

4.1. Site Description

Climatically, the area of Arba Minch, with the city located at 1280 MASL, is classified as “Aw” under the Koppen-Geiger system, or tropical wet and dry (Savannah) climate with annual average temperature 21.8°C, lowest averages in June at 20.8°C, and highest at 23.3°C in the month of March, thus showing quite a stable temperature range.

Annual rain precipitation is 818mm, chiefly concentrated within the main rain season (April-May), and in the period of September-October (small rains). FAO Classification as used by the Ethiopian Forestry Research Centre may be that of semi-dry lowland and plateau, (zone III).

According to traditional Ethiopian customary classification, the area may be classified as an upper “Kolla” zone, bordering however temperate highlands or “Woina Dega”. As far as natural vegetation is concerned, Wezeka Kebele in Gamo Gofa is characterised by a prevalence of *Hyparrhenia filipendula*-*Combretum molle* associated perhaps in relation with frequent bushfires, as *Hyparrhenia* is commonly considered a pyrophyte gramineae.

Soils are mostly sandy loams, usually well drained, with little phosphate content available to plants, and pH that may be considered as neutral / sub-neutral (7/7.5) thus being generally well suited for *Moringa* cultivation provided adequate fertilisation is secured.

The location as depicted below is considered as being eligible for organic certification since local Government Agricultural Services report a period of well over three years during which the selected farmland has been free from application of prohibited agricultural chemical inputs (chemical fertilisers, pesticides, herbicides).

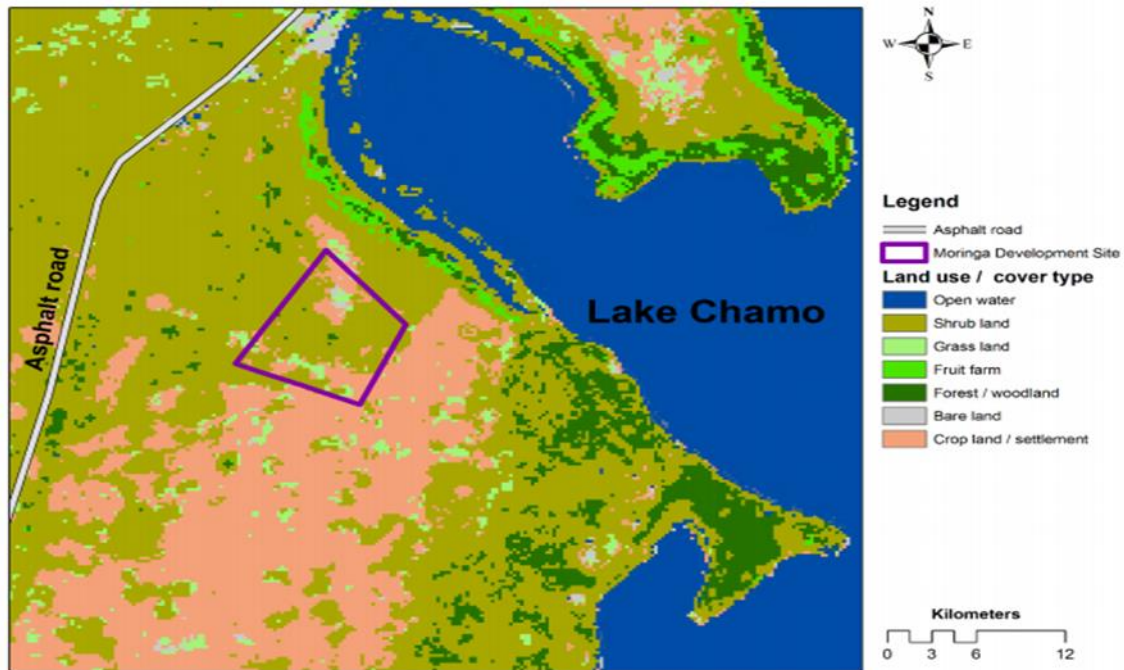


Fig. 2: Map of the Project Site, Inception Report, July 2017

Regarding irrigation, lake Chamo water quality is presently unfitted for sustained agricultural irrigation purposes. The lake is considered, in fact, as being heavily polluted especially in terms of nitrogen and phosphorus content while its salinity / alkali content has lately reached worrying concentrations mainly due rapid population growth and riverine agricultural developments, on-going land degradation in the watershed, turbidity of tributaries etc.

4.2. Overall Objectives

To investigate the feasibility of establishing a *Moringa stenopetala* organic production system over 28 ha of land at Wezeka Kebele, Arba Minch Zuria Woreda, Gamo Gofa, organised and managed according to general standards commonly applied for national and international organic certification meant to facilitate / create increased market opportunities for Moringa commercialisation, improve household food security and represent a sustainable land-use model for out-growers according to established organic farming principles of health, ecology, fairness, and care.

4.3. Intervention Purpose

The intervention purpose is to ascertain the level to which both the farming community and consumers may benefit (economically, environmentally, physically and from a nutritional point of view) from the implementation of an integrated resource utilisation system building on existing local knowledge, traditions, and culture, and designed to optimise land, plants, and animal interactions, thus satisfying human needs at both ends of the value chain while sustaining / enhancing the quality of the environment for future generations.

4.4. Intervention Results

An organic certified productive system for the integrated production of *Moringa stenopetala*, and other cash and food crops, is established over an area of 28 ha for productive and demonstration purposes on the land rendered available for the Moringa Value Chain Project by Local Authorities at Wezeka Kebele.

Such enterprise will demonstrate viability of organic Moringa production by a Public Private Partnership between a local resident cooperative and Woreda Administration, able to efficiently participate to the Moringa Value Chain initiative as a mean to add-value to Moringa and other local agricultural products.

Under the foreseen system, local resident cooperative and BoANR will jointly run the productive process, with individual cooperative members. Farmers who want to participate in the cooperative as out-growers will be supported by the cooperative (and BoNAR and the Project).

4.5. Planned Activities

4.5.1. Provision of Moringa Organic Propagation Materials

The labour contribution of women should be highlighted by creating a “collective nursery”. The collective nursery (0,50 ha) will facilitate the control of the genetic characteristic of the varieties propagated. The nursery is formed by a “seedbed” and a “growth area”. Related costs will be covered by the project.

Considering the genetic variability of *Moringa stenopetala*, it is proposed the creation of a “clonal garden”. In the clonal garden the genotypes, previously selected through “mass selection”, will be planted and then evaluated. The best genotypes will be propagated; in this way the good quality of the new plantation is guaranteed. Good growth can be achieved by utilising young seeds and by providing a good management of the seedbeds (the substrate must be of good quality).

Local varieties would be used to avoid poor rate or growing. It is important to provide organic phytosanitary treatments (copper and sulphur to avoid dumping).

About 120.000 organically produced seedlings will be purchased from the nursery established at Wezeka Kebele under the MVC Project. The production will take place on a separate portion of the nursery so as to respect organic productive standards, including controlled seed provenance (either from organic farms or from local sources not utilising chemical fertilisers or pesticides). In addition, support in this field may be provided by EOSA (Ethiopian Organic Seed Action).

Seedlings will be raised into 1kg polyethylene bags, avoiding chemical fertilisation and pest treatments, which should only include permitted substances (compost with animal manure, treatments with neem / pyrethrum extracts, etc.).

4.5.2. Laying-out of the Organic Production Scheme

An adequate portion of land to cover 28 ha plantation plus related services (1 ha and half - internal road network, shades, store, stables and nearby manure, by-products, residues and compost deposits, irrigation facilities) will be demarcated and developed, with allowances being made for natural hedges, live fencing as buffers on boundaries, and fodder trees planting to isolate from nearby cultivations and provide nesting places, attract pest predators, cater for livestock needs; indigenous flowers strips be established to be used as beetle banks etc., as required under organic regulations.

4.5.3. Establishing and Cultivating Moringa Trees

Under the chosen agro-forestry system, Moringa trees, planted at 3 x 4 m. spacing for seeds production (2/3 of the land, 18,5 ha) will be also used as cover crop, providing shade, shelter, and soil protection for underlying cultivations, and at the same time getting advantage from other crops irrigation, mulching, organic fertilisation and pest treatments. Planting pits will have 50 x 50 cm dimensions and will be hand dug; at the time of plantation, pits will be filled with 70% soil, 20-30% sand, and 3 kg. of seasoned farmyard manure. 1/3 of the land (9,5 ha) at 2m. per 25 cm. will be cultivated for leaves production.

Transplanting, harvesting and nursery establishing will be the agricultural operations considered as being included into investment costs, and, as such, remunerated by the Project.

All other agricultural operations such as pruning / pollarding, fertilising and pest control, irrigation, general care and protection will be executed free of charge by the farmers/coop. members in return for the land being allocated to them, for private organic agricultural production, as per Right's Use Contract, mentioned above, to be signed.

Other agricultural operations will include: at least three pruning to be done in the course of the 1st year to keep the tree at a reasonable height (3-4 m) and given its correct shape by enabling lateral branches to the maximum extent. Maintenance pruning is to be executed in following years at the beginning of the main rainy season. Fertilisation with manure / compost is to be done twice a year, before small and main rainy seasons.

Irrigation by rubber hose, watering can etc. Is to take place in dry periods of the year as part of the normal watering of underlying crops. Manual weeding with hoe 4 times per year, leaving weeds around the base as mulch; pests and disease control to be done as part of normal operations needed for underlying crops, with organic permitted principles and products.

Harvesting leaves and pods to take place from 2nd year onward every 2 months (6 harvests / year), with shears, sickle or knife, or by hand picking; pods to be harvested when becoming brown and dry (for oil) or before (for fresh consumption).

Harvested leaves and pods will be brought to the cooperative's processing plant for sale. Due to the relatively heavy workload involved and the particular care that needs to be given to this operation,

the activity will receive remuneration by the Project.

4.5.4. Agricultural Intercropping and Rotations

Organic Agricultural production will be based on intercropping (growing two annual crops together), commonly a leguminous crop like beans, or a green manure crop, in alternating rows with a cereal or a vegetable crop, and crop rotation either on a yearly basis or for Kiremt / Belg planting, in order to diversify production, maximise benefits from land, conserve / increase soil fertility and limit pest occurrence. As a reference, a number of combination of crops that complement each other well is hereby given.

Appropriated and updated record-keeping regarding crops grown in individual plots each year will be mandatory for the cooperative in order to ensure appropriate environmentally-friendly crop rotations are followed by individual farmers, and record pest outbreaks, particularly those due to defoliator moth (*Noorda bliteallis*) according to organic agricultural standards.

Regular monitoring by Cooperative and BoANR technical personnel will make sure organic prescriptions are strictly followed and crops including Moringa trees are well maintained and attended.

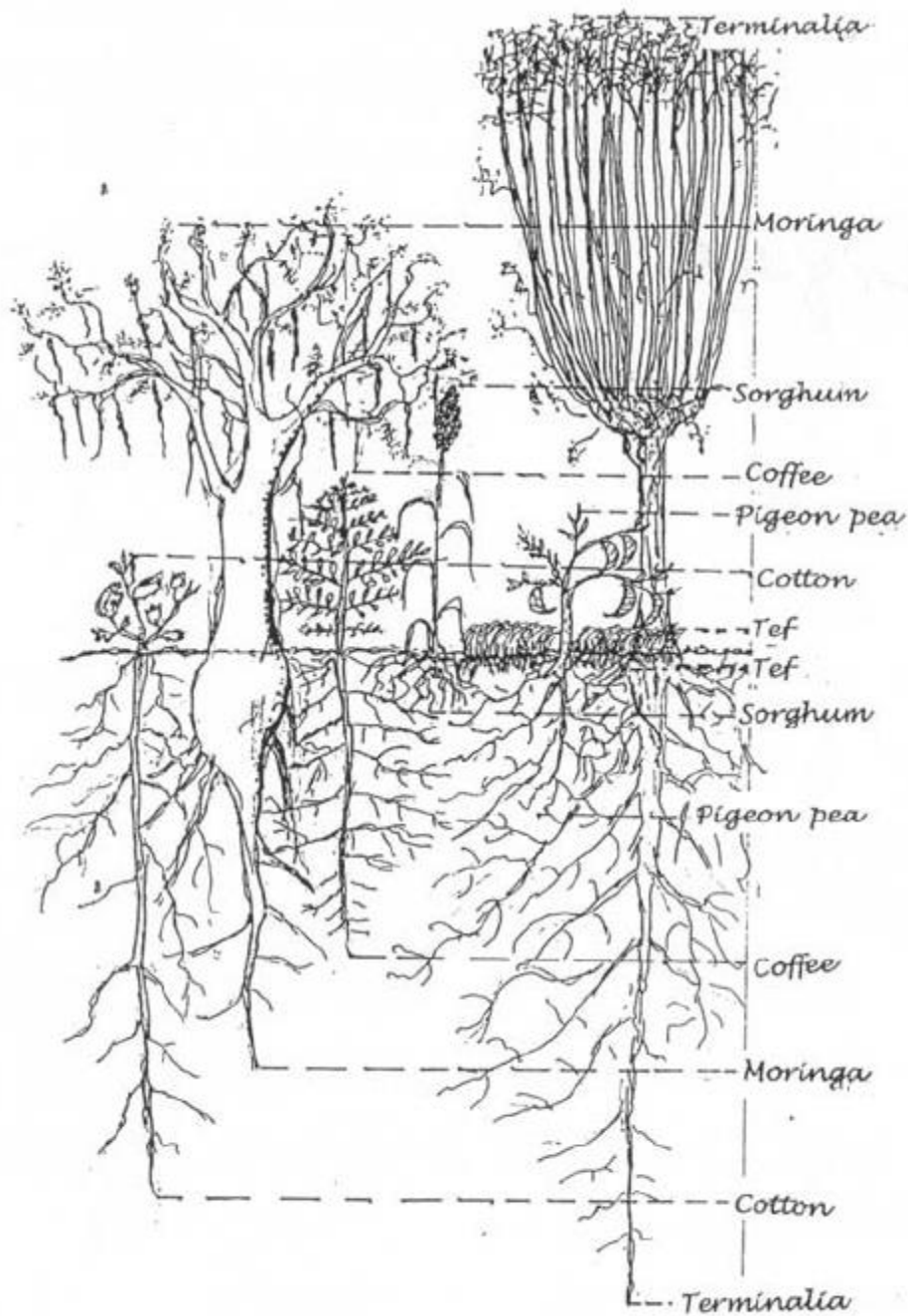


Fig. 3: examples of intercropping

4.5.5. On-farm Livestock Management

As organic farming will need abundant amounts of farm yard manure (about 30 tons/ha/year) together with compost (5 tons/ha) and other bio-fertilisers such as cattle urine (which needs to be free from pollutants and contaminants), the organic farm should plan for the presence of 8-10 heads of cattle centrally managed by the cooperative, able to cater for fertilisation needs as well as for required farm labour (ploughing, harrowing, and thrashing for the 110 beneficiaries), and transport.

Stables will be furnished with slightly sloping concrete floor so as to facilitate gathering of straw, livestock manure and urine.

This option is only in case the organic manure provided by the farmers is not enough.

Compost can be prepared in farm site, after specific training activities.

Co-operative members working on the scheme will be required to deliver manure, crop residues, leguminous fodder crops, green manures, etc. to the on-farm animal feed-lot, while fodder trees planted along boundaries and roads will also be utilised as animal feed. Cattle will be utilised on a rotational basis under cooperative control.

5. ASSUMPTIONS

5.1. Assumptions, Risks, and Limitations

General risks related to the organic sector development in Ethiopia include inadequate knowledge of organic techniques by farmers, processors and exporters; a lack of governmental / private extension services and training; high certification expenses; a lack of quality and consistency in organic inputs and products supply; undeveloped local market and specialised research; and weak network in coordination and mobilisation of human and financial resources.

Eventually, for what concerns possible local constraints, availability of labour may be an issue. It has already been mentioned by Project authorities that daily transport of trained farmers from their villages of residence to the demonstration plot / nursery site at Lake Chamo is presently seen as a difficulty which is under consideration.

This aspect, together with generally higher labour inputs to be expected when following organic farming protocols if compared with conventional agricultural methods, may result in a scarcity of daily labourers, especially if these individuals would have other home or agricultural duties to be performed elsewhere.

This may partially be eased by the provision of allocating irrigable plots within the organic farm, providing in many cases returns to farmers from private sale of organically produced crops, considered to be well-above current levels of average daily wages earnable elsewhere.

It is here worth mentioning the importance for the Project, the local people committees and the foreseen cooperative, to plan well in advance as part of the selection method, for perspective members to have sufficient time availability as to guarantee that plots are not left unattended.

5.2. Socio-cultural Aspects

An important aspect to be taken into consideration by the establishment of a cooperative-run organic Moringa farm and its associated future out-growers scheme (based on local knowledge and the well-established principles of agro-forestry), will be its beneficial effects on local communities particularly small-scale resource-poor local farmers.

Application of standard organic cultivation techniques and recognised certification will increase much

needed market opportunities, while substantially contributing to fighting food and nutritional insecurity, and enhancing the role of women together with their perception and standing within the local society.

6. IMPLEMENTATION

6.1. Organisation and Implementation Procedures

It is proposed that a Public Private Partnership between the Local Woreda (BoANR) Authorities and a Cooperative constituted by trained beneficiaries be established. Supposing a 28ha farm will be organised and run under organic production standards: BoANR and the Project will give to farmers/cooperative members the possibility to participate from the start in this initiative as out-growers, after which all training activities will be completed. The cooperative will support these members as all the others. After 3 years of the cooperative's activities, all 110 beneficiaries shall become out-growers and a new group of farmers will join the Wetzeca cooperative and undergo the same training process of the previous group.

Individual cooperative members and their families will cultivate Moringa trees and underlying organic agricultural / horticultural crops, retaining for private consumption / sale all crops from the members organically produced herein. Moringa products (leaves and pods) will be sold by the members to the cooperative, but a share of the amount paid by the cooperative will be destined to the Fund of the company.

The cooperative will therefore retain its demonstration / productive role, with BoANR, the Project Manager, and its local staff remaining in charge of investment costs and its maintenance, extension / training organisation, technical supervision and management, etc. The Cooperative will also be in charge of nursery production and sales to private growers, Moringa processing and marketing.

6.2. Cost Estimate

Cost estimates for the proposed intervention have been set as follows:

6.2.1. Investment Costs

Organic Moringa Farm - Investment costs				
Investments related to a 30 ha farm of which 28 ha being cultivated				
Item	Unit	Q.ty	Unit Cost (€)	Total cost €
Land Improvement				
Clearing, cutting, and disposing of residuess	ha	28	200,00	5.600,00
Mechanical land levelling	ha	28	150,00	4.200,00
Fencing	n.	1	6.000,00	6.000,00
Establishing Moringa for seeds production, 825 plants/ha *	ha	18,5	1.650,00	30.525,00
Establishing Moringa for leaves production 20,000 plants/ha *	ha	9,5	20.000,00	190.000,00
Total Land Improvement				236.325,00
Construction				
Low technology irrigation & drainage network	ha	28	10.000,00	280.000,00
Shades and storage facilities	n.	2	30.000,00	60.000,00
Stables, livestock management structures	n.	1	40.000,00	40.000,00
Roads and paths network	l.s.			8.000,00
Total Construction				388.000,00
Equipment, supplies, and other expenses				
Light truck	n.	1	40.000,00	40.000,00
Motorcycle	n.	2	2.000,00	4.000,00
Bicycle	n.	4	150,00	600,00
Plough	n.	20	200,00	4.000,00
Hand Sprayer	n.	80	30,00	2.400,00
Implements tools and materials	n.	1	10.000,00	10.000,00
Wheelbarrow	n.	110	30,00	3.300,00
Organic certification	n.	1	2.500,00	2.500,00
Balance	n.	3	79,00	237,00
Stainless steel work table	n.	3	110,00	330,00
Stainless steel cutting blade	n.	10	25,00	250,00
Wash basin	n.	3	280,00	840,00
Metal grids	n.	3	25,00	75,00
Cart	n.	3	130,00	390,00
Plastic box	n.	20	8,00	160,00
Greenhouse for drying	n.	3	1.200,00	3.600,00
Mill	n.	3	1.200,00	3.600,00
Packaging	n.	1	5.000,00	5.000,00
Cold Press	n.	1	220,00	220,00
Total Equipment				81.502,00
Livestock				
Work oxen		10	1.500,00	15.000,00
Total Livestock				15.000,00
Total Investment Costs				720.827,00
Contingencies 10%				72.082,70
Grand Total Investment costs				792.909,70

6.2.2. Recurring Costs

Organic Moringa Farm - Recurring costs														
Item	Unit	Q.ty	Unit cost (€)	Total cost (€)	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Crops (Moringa only)														
Organic Fertiliser Supplements	ha	28	30,00	840,00	840,00	840,00	840,00	840,00	840,00	840,00	840,00	840,00	840,00	840,00
Organic Pesticides	ha	28	50,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00
Harvesting / handling harvest	ha	28	1500	42.000,00	42.000,00	42.000,00	42.000,00	42.000,00	42.000,00	42.000,00	42.000,00	42.000,00	42.000,00	42.000,00
Irrigation fees and maintenance	ha	28	50	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00	1.400,00
Total Crop				45.640,00	45.640,00	45.640,00	45.640,00	45.640,00	45.640,00	45.640,00	45.640,00	45.640,00	45.640,00	45.640,00
Farm Personnel														
Workers (n. 2 skilled)	m/m	48,00	500,00	24.000,00	24.000,00	24.000,00	24.000,00	24.000,00	24.000,00	24.000,00	24.000,00	24.000,00	24.000,00	24.000,00
Watchman	m/m	12,00	400,00	4.800,00	4.800,00	4.800,00	4.800,00	4.800,00	4.800,00	4.800,00	4.800,00	4.800,00	4.800,00	4.800,00
Technical supervisor	m/m	12,00	600,00	7.200,00	7.200,00	7.200,00	7.200,00	7.200,00	7.200,00	7.200,00	7.200,00	7.200,00	7.200,00	7.200,00
Total Personnel				36.000,00	36.000,00	36.000,00	36.000,00	36.000,00	36.000,00	36.000,00	36.000,00	36.000,00	36.000,00	36.000,00
Livestock														
Organic Food Supplements	n.	1,00	300,00	300,00	300,00	300,00	300,00	300,00	300,00	300,00	300,00	300,00	300,00	300,00
Veterinary and Health	n.	1,00	800,00	800,00	800,00	800,00	800,00	800,00	800,00	800,00	800,00	800,00	800,00	800,00
Total Livestock				1.100,00	1.100,00	1.100,00	1.100,00	1.100,00	1.100,00	1.100,00	1.100,00	1.100,00	1.100,00	1.100,00
General Farm Expenses														
Infrastructure maintenance & running expenses	n.	1,00	8000	8.000,00	8.000,00	8.000,00	8.000,00	8.000,00	8.000,00	8.000,00	8.000,00	8.000,00	8.000,00	8.000,00
Fuel, lubricants, other expenses	n.	1,00	4000	4000,00	4000,00	4000,00	4000,00	4000,00	4000,00	4000,00	4000,00	4000,00	4000,00	4000,00
Total Farm Expenses				12.000,00	12.000,00	12.000,00	12.000,00	12.000,00	12.000,00	12.000,00	12.000,00	12.000,00	12.000,00	12.000,00
Total Recurring Costs					94.740,00	94.740,00	94.740,00	94.740,00	94.740,00	94.740,00	94.740,00	94.740,00	94.740,00	94.740,00
Contingencies 10%					9474,00	9474,00	9474,00	9474,00	9474,00	9474,00	9474,00	9474,00	9474,00	9474,00
Grand Total Recurring Costs					104.214,00	104.214,00	104.214,00	104.214,00	104.214,00	104.214,00	104.214,00	104.214,00	104.214,00	104.214,00

6.2.3. Nursery Costs

Organic Moringa Farm - Nursery costs to produce 190,000								
LIST OF MATERIALS AND COSTS								
List of Materials/ Standard/ for Nursery Operation	Unit	Quantity	Material used per seedling or Materials per bed	Unit Price Birr	Total cost Birr	Total cost €**	Remarks	
Polytene bag: (standard 1 roll = 15 kg) =2500 sacks	kg	1.140,00	0.006 kg	140,00	159.600,00	5.148,39	size of 1 polytene bag for 1 seedling = 12cm diameter with 15cm height = 0.006kg	
Moringa Seeds*	Kg	410,00	190.000x 3 seeds per bag	50,00	20.500,00	661,29	Estimation 1 kg = 1200 - 1500 no. of seeds;	
Planting Media	Forest soil	Sack	55,00	0,0017m ³ * 1/3	500,00	27.500,00	0,0017m ³ is the volume of polytene bag; to fill the polytene bag, we used the three planting media with 1:1:1 ratio of forest soil, manure and sand	
	Manure	Sack	55,00	0,0017m ³ * 1/3	500,00	27.500,00		
	Sand	Volume (m3)	15,00	0,0017m ³ * 1/3	750,00	11.250,00		362,90
Mulching	Wood	Pcs	700,00	20 pcs per bed/ 1800 seedling	25,00	17.500,00	564,52	For 1x10m bed size - 1800 seedling, we need 85m wood = estimation 20 pieces of wood per bed
	Nail	Packet	18,00	1/2 kg per bed	160,00	2.880,00	92,90	For preparation of mulching
	Straw	Bunch	40,00	1 bunch of straw per bed	300,00	12.000,00	387,10	Estimation 1 bunch straw for 1 bed.
TOTAL					278.730,00	8.991,29		

TYPES OF WORK AT NURSERY OPERATION AND							
Types of Work	No. of Labour	No. of working days	Labour Birr/day	Total cost Birr	Total cost €**	Remarks	
Media preparation at nursery site	a, Preparation of sowing media and plastic bag; filling the plastic bags	110,00	8,00	100,00	88.000,00	2.838,71	
	b, Filling the plastic bags with prepared media (1:1:1) ratio sand, forest soil and manure	110,00	8,00	100,00	88.000,00	2.838,71	
	c, Bed preparation and putting the prepared filled plastic bag on prepared bed	110,00	8,00	100,00	88.000,00	2.838,71	
Preparation of seeds for seed sowing	10,00	10,00	150,00	15.000,00	483,87		
Seed Sowing on prepared plastic pots and	40,00	8,00	100,00	32.000,00	1.032,26		
Mulching preparation	40,00	4,00	100,00	16.000,00	516,13		
Maintaining the moisture of the prepared media	10,00	15,00	50,00	7.500,00	241,94		
Different cultural practices after seed germination	10,00	150,00	50,00	75.000,00	2.419,35		
TOTAL	440,00	211,00		334.500,00	13.209,68		
TOTAL NURSERY COSTS				613.230,00	22.200,97		

* Average weight of single moringa seed: 0,7 gr = 1.400 seeds per kg

** Applied Currency rate of conversion: 1€ = 31 Birr

6.2.4. Production-Revenues

Organic Moringa Farm									
Basic reference data									
Description	Unit	Q.ty							
Dimension of seed production plot	hectars (ha)	18,5							
Dimension of leaves production plot	hectars (ha)	9,5							
Number of plant per hectar for seed production 4m x 3m Agriforest layout	N.	825							
Number of plant per hectar for leaves production 2m x 0,25m semi-intensive layout	N.	20.000							
Average yearly seeds harvest per plant at full capacity	Kg.	4,5							
Average yearly leaves production per plant at full capacity (6 harvests per year)	Kg.	2,0							
Estimated sale price for leaves/kg	€	0,5							
Estimated sale price for seeds/kg	€	2							
Full capacity production/revenues evaluation			Dimension of production plots (ha)	Number of plants per hectar	Total number of plants	Average yearly production per hectar at full capacity (tons)	Total yearly production per plot (tons)	Estimated average price per ton (€)	Total estimated revenue per year (€)
Seeds production			18,5	825	15.263	4	74	€ 2.000,00	€ 148.000
Leaves production			9,5	20.000	190.000	40	380	€ 500,00	€ 190.000
TOTAL					205.263				€ 338.000

6.2.5. Tentative Cash-flow

Organic Moringa Farm																	
Financial Flow & Internal Rate of Return																	
ITEM	YEARS															TOTAL	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
COSTS																	
Recurring costs	104.214	104.214	104.214	104.214	104.214	104.214	104.214	104.214	104.214	104.214	104.214	104.214	104.214	104.214	104.214	104.214	€ 1.042.140
REVENUES																	
1° moringa fresh leaves (kg ^{ha})	5.000	10.000	17.500	25.000	30.000	40.000	40.000	40.000	40.000	40.000	40.000	40.000	40.000	40.000	40.000	40.000	
Revenue fresh leaves €	€ 23.750	€ 47.500	€ 83.125	€ 118.750	€ 142.500	€ 190.000	€ 190.000	€ 190.000	€ 190.000	€ 190.000	€ 190.000	€ 190.000	€ 190.000	€ 190.000	€ 190.000	€ 190.000	€ 1.365.625
2° moringa seeds (kg/ha)	0	400	1.000	2.000	3.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	4.000	
Revenue seeds €	€ -	€ 7.600	€ 19.000	€ 38.000	€ 57.000	€ 76.000	€ 76.000	€ 76.000	€ 76.000	€ 76.000	€ 76.000	€ 76.000	€ 76.000	€ 76.000	€ 76.000	€ 76.000	€ 501.600
INVESTMENT COSTS																	
Payment of capital + interests				€ 83.325	€ 83.325	€ 83.325	€ 83.325	€ 83.325	€ 83.325	€ 83.325	€ 83.325	€ 83.325	€ 83.325	€ 83.325	€ 83.325	€ 83.325	€ 999.901
TOTAL REVENUES €	€ 23.750	€ 55.100	€ 102.125	€ 240.075	€ 282.825	€ 349.325	€ 349.325	€ 349.325	€ 349.325	€ 349.325	€ 349.325	€ 349.325	€ 349.325	€ 349.325	€ 349.325	€ 349.325	€ 4.197.126
Financial Flow €	-€ 80.464	-€ 129.578	-€ 131.667	€ 4.194	€ 182.805	€ 427.916	€ 673.027	€ 918.138	€ 1.163.250	€ 1.408.361	€ 1.653.472	€ 1.898.583	€ 2.143.694	€ 2.388.805	€ 2.633.916	€ 2.633.916	€ 15.154.452
																	Profit at 15th Y

Adopted hypotheses

Organic Moringa Farm of 30 ha of which 9,5 ha for leaves and 18,5 for seed production; leaves yield 80 t/ha, seed yield 4 t/ha

Internal Rate of Return % 17,89%

ITEM	ha	Selling price/kg
Seeds production plot	18,50	€ 2,00
Leaves production plot	9,50	€ 0,50

Money cost evaluation

Investment cost	€ 792.910
Nursery cost	€ 22.201
Total costs	€ 815.111
Amount to be financed	€ 570.578
Period of redemption of loan	3+12 years
Bank interest at 8%/year (12 years)	€ 429.323
Total amount to be reimbursed	€ 999.901
Amount to be reimbursed/year	€ 83.325

The investment costs must cover part of recurrent costs of the first year, after which the farm would become self-sustaining as the project financial flow would turn positive.

The total cost of the project (Investment and Recurring costs for the first year) would be €792.909,70

6.3. Economic and Financial Considerations

Moringa stenopetala production assumptions include regular localised irrigation during dry periods, yielding about 70% production compared with *Moringa Oleifera* grown under the same conditions (Agro-forestry).

In this project 28 ha are cultivated 2/3 (18,5ha) for seeds production (agro-forestry system) with productions of 4/ton/ha/year, 1/3 (9,5ha) for leaves and pods production (semi-intensive) with a production of 2/ton/ha/year with 6 commercial harvest/year starting from 2nd year onward, being sold fresh on-site to the local processing facility.

Sale prices have been estimated at € 0.5/kg for fresh leaves, € 2/kg for seeds, as products will be sold on bulk to the nearby cooperative processing facility under a fixed-price contract. Fuel wood resulting from the annual pruning has been estimated at € 0.3/q for sale on the local market, or for internal use.

Considering investments and recurring costs (including Moringa plantation), the Moringa producing enterprise will become financially self-sustainable by the end of year 3, showing by the 15th year an internal rate of return of 17,80%, thus potentially representing an economically viable component of the Moringa Value Chain development for the Arba Minch area.

7. REFERENCES

- ARISE Standards for Organic Farming, New Delhi, India, 2000.
- S. Huke, J. Plecan, Planning for Agroforestry, Save the Children, USA, 1988.
- Ato Berhanu et al., Growth of some Forest Trees in Ethiopia and suggestions for species selection in different climatic zones, Forest Research Note no.2, Forestry Research Center, Addis Abeba, 1986.
- G. Barbera et al., Konso Cultural Landscape: Terracing and Moringa, Proceedings of the 2nd Conference, Italian Cultural Institute, Addis Abeba, 2011.
- J. P. Gittinger, Economic Analysis of Agricultural Projects, EDI Series in Economic Development, John Hopkins University Press, Baltimore, USA, 1982.
- McDonald P. Benjamin, Investment Projects in Agriculture, ELBS Editions, Great Britain, 1985.
- Friedrich von Breitenback, The Indigenous Trees of Ethiopia, Ethiopian Forestry Association, Addis Abeba, 1963.
- Teshome Soromessa et al., Ecological study of the vegetation in Gamo Gofa zone, southern Ethiopia, Tropical Ecology 45(2), 2004.
- Ababu Teklemariam et al., Water Quality Monitoring within the Abaya – Chamo Drainage Basin, Proceedings of Lake Abaya Research Symposium, 2004.
- N. K. Tyagi, Managing Saline and Alkaline Water for Higher Productivity, Central Soil Salinity Research Institute, Haryana, India. CAB International 2003.
- Ethiopian Organic Forum: Public Private Partnership, UNCTAD – UNEP, Addis Abeba, 2009.
- Dawit Dikasso, Research, Manufacturing, and Regulatory Mechanisms of Moringa stenopetala: a Working Paper.
- Dechasa Jiru et al., Leaf yield and nutritive value of Moringa stenopetala and Moringa oleifera, Strategies, standards and markets for a better impact on nutrition in Africa. Accra, Ghana, 2006.
- Ilka Gomez, Lisa Thivant, Training Manual for Organic Agriculture, FAO, 2015.
- Newton Amaglow, et al., Moringa et autres vegetaux for potentiel nutritionnel, Strategies, Normes, etc, Accra, Ghana, 2006.
- J. O. Animashaun, A.A. Toye, Feasibility analysis of leaf-based Moringa oleifera plantation in Nigeria, Agroresearch n. 3, 2013.
- Dechasa Jiru et al., Leaf yield and nutritive value of Moringa stenopetala and Moringa oleifera accessions: its potential farming role in food security in constrained dry farming agroforestry system, Moringa etc. : Strategies, etc., Accra, Ghana, 2006.
- Indian Council of Forestry Research and Education, Moringa Oleifera, Forest Research Institute, Dehra Dun, India.
- de Saint Sauvers, Moringa Association of Ghana, Growing and Processing Moringa Leaves, France, 2010.
- Irénée Modeste Bidima, Production and Processing of Moringa, Pro-Agro Collection, Yaoundé, Cameroon, 2016.
- S. Hedge, V. Hedge, An overview of Moringa production in Ethiopia, International Journal of Sciences and Research, vol. 4, issue 4, 2015.
- R. Devi et al., Organic Farming and Sustainable Development in Ethiopia, Scientific Research and Essays, 2007.
- C. L. Mohler, S. E. Johnson, Crop Rotation on Organic Farms, a Planning Manual, NRAES, USA, 2009.
- Ethiopian Standards Agency, Organic Products – Code of Practice, Addis Abeba, 2013.

8. VALUE CHAIN

8.1. Main Feature

A value chain is the full range of activities- including design, production, marketing and distribution businesses go through to bring a product or a service from competition to delivery. For companies that produce goods, the value chain starts with the raw materials used to make their products, and consists of everything that is added to it, before it is sold to consumers.

Each stage of process in the chain has a link to the next in order for the processes to form a viable chain.

A value chain can be defined as the sequence of value-adding activities, from production to consumption through processing and commercialization.

Each segment of a chain has one or more backward and forward linkages.

The “fork to table” integration of a chain can increase efficiency and value through reduction of wastage, ensuring food safety, providing freshness, the decreasing consume prices and improving farm prices and incomes.

Value Chain can be defined as the set of actors (private, public and including services providers) and the sequence of acting of value-adding activities involved in bringing a product from production to the final consumer.

It is the analysis assessment of the actors and factors influencing the performance of a firm and the relationships among participants to identify the driving constraints in order to increase efficiency, productivity and competitiveness, and how constraints can be overcome (Fries, 2007) to summarize the key aspects of the value chain definition for agriculture.

The value chain management is the process of actually organizing all the activities, so they can properly be analysed. The goal of value chain management is to ensure that those in charge of each stage of the value chain are communicating with one another, to make sure the products is getting in the hands of customers as seamlessly and as quickly as possible (M.E.Porter).

8.2. Market Target Strategies

Achieving competitive advantage requires a firm to make a choice about the type of competitive advantage it seeks to attain and the scope within which it will attain it (M.E. Porter).

If a firm is targeting customers in most or all segments based on offering the lowest price, this is a cost leadership strategy.

If it targets customers in most or all segments based on attributes other than price (higher product quality or service to command a higher price) it is pursuing a differentiation strategy.

If it is focusing one or a few segments, it is following a focus strategy.

Moringa stenopetala will be a new entry on formal national and international markets. The choice that is proposed is based on differentiation and focus strategies. *Moringa stenopetala*'s powered leaves and edible oil will rely on their Ethiopian roots and origin, their history based on good practices,

increased capabilities of the community and the important nutrition contribution to reduce malnutrition in the Southern Region and Ethiopia. On international markets, *Moringa stenopetala* will have to compete not only with other beneficial plants but especially with its close relative from Asia, *Moringa oleifera*. Both of the plants have a unique nutritional value based on their very similar genetic profile. *Moringa oleifera* is known and appreciated on the global market. *Moringa stenopetala* will be a new entry, a “novel food” in national and European markets.

The organic production, fair trade and history of the products are important and attractive features in the European market competition.

8.2.1. Raw material transformation

The fresh products must be harvested in low humidity so as to avoid fungal fermentation. The harvesting process should always be done at the same time of the day.

The transformation process of the Moringa plant’s produce will take place in a covered space, where the raw material will arrive from the production site immediately after harvesting. If possible, the material should be pre-selected when harvested, using a sample book containing the different colours of the leaves (Metabolically Efficient Information Processing (Balasubramanian, 1998), from yellowish green - sample number 1 - to dark green - sample number 6 -.

Through this comparison, it is established that the leaves to choose are those that match the numbers 3 and 4 of the sample: light green.

No broken, deteriorated or stained leaves and branches must be collected, with insects and / or other organic material.

The colour card should only be used to select leaves, also for statistical purposes, and must always be cleaned and disinfected after use.

The scissors intended for the selection purpose should be used for this purpose only and must be washed and disinfected after use. Containers for collection must have different sizes: for large branches, small branches and leaves. This process is in the scope of maintaining uniformity in the final product. Containers must be cleaned.

25% of the foliage must be left on the plant to prevent physiological imbalances due to intense pruning.

After collection, the raw material must be placed in clean containers of 70 x 56 x 38 and placed in a shady, dry space. If the journey from the collection site to the processing site is long, the foliage must be protected by newspapers.

Regarding hygiene when harvesting, the following actions are recommended: collectors must have clean hands free of biological and chemical contaminants. The clothing must cover the skin of the body to avoid insect bites, and the boots must be made of rubber.

Preparation of the raw material

Once harvested, the fresh foliage is to be transported to the processing area where a scale will weigh 1 kg of foliage. The price to pay for the product will be proportional to the weight.



Weight scale



Stainless steel work table

Cleaning the foliage

After the weighting process, the containers with the fresh material are brought to the washing area where there are tables on which to separate the leaves from the branches.



Stainless steel cutting blade

At the same time, fresh product quality checks will be carried out.

The washing operation is via immersion in water containers containing a diluted solution with sodium hypochlorite (5mg per 5Lt). The maximum immersion time is 5 minutes.

The material is then placed on metal grids to drain the water.



Wash basin



Metal grids

Subsequently, the material is moved into clean plastic containers and dried.



Drying

The drying time depends on the circulating air (ventilation speed) and the processed product to be obtain.

The ratio between cultivated area and surface for the dried product is 1/10; i.e. 10 sqm. of cultivated area corresponds to 1 sqm. Another aspect to consider is that every 5 kg of fresh material is transformed into 1 Kg of dried product.

Drying can be done through direct irradiation or inside a greenhouse, where solar energy turns into heat. This energy is constant, uncontaminated and free.

The wooden boxes, with a wire grid, are placed in 2 lateral rows on 3 levels.

The important elements are:

- the collecting area
- the drying chamber, where the circulating air dehydrate the product.

Both elements can be made in various shapes according to the structure used.

The structure of the greenhouse must be made of wood and have a maximum height of 2 meters and 10 cm, which allows 3 levels of boxes; the roof must be made with transparent polycarbonate and the sides covered with white polyethylene; the concrete floor must be of a 10 cm thickness.

The greenhouse must be oriented from East to West to get maximum solar irradiation.

The product is ready when the humidity is between 10 and 15 degrees Celsius. With this technique the product can be ready after 24 hours compared to 72 with other methods.



Grinding

Once dried, the product must be grinded to obtain particles.

The grinding can be done with a conventional mill that is equipped with all the tools to obtain a specific kind of grind; blades, sifts, strainers.



Vertical mill



Horizontal mill

After the grinding comes the packaging, after a quality control check has been carried out.



The packaged product is put in boxes of 25 units each, which will be deposited in a cool and bright environment, protected from insects and rodents.



Packaging and labelling

8.2.1.1. Seed Oil Production

Results of a research study (Eyassu Seifu, 2012-Physiochemical Properties of *Moringa stenopetala*) showed that *Moringa stenopetala* seeds contain high oil and protein contents suggesting that it could be used as important source of oil and protein.

The seeds of *Moringa stenopetala* contain edible oil that can be used for cooking and salad dressing (Lolas et al., 2003). *Moringa stenopetala* seeds are reported to be larger than *Moringa oleifera* seeds (Foidl et al. 2001). The average weight of the kernel (59.6g/100 seeds) observed in this study is more than double to the values reported for *Moringa oleifera* (21,2- 22,5g/100 seeds).

Vegetable oils constitute an important part of human livelihood all over the world. The widening gap between demand and supply necessitates alternative sources of edible oil to augment global production. To meet the growing demand of fats and oils, concerted efforts have been made to increase the seed yield.

A researcher's article on the extraction of cold pressed Moringa oil (Janaki, S. and Jamina Devi, Department of Food and Nutrition Madre Teresa Women's University, India) presented the following methods and results:

'Seeds have to be dried in sun for two days or in a greenhouse for one day. The dried seeds are sent to the shell removing unit, to get the kernels. The kernels are further dried for a week at room temperature.

Seeds have to be handled carefully for cleanliness. Then 8Kg of seeds are poured on the receiving funnel of the cold press.



Cold press



Edible Oil

In the next few minutes the oil was dripping from the outlet collected in a container, weighed, and subtracted to express the weight of the oil (3Kg). The oil extracted (a golden yellow colour) underwent a sedimentation process for 3 days to remove impurity and protein residues. On the fourth day the settled oil was decanted, filtered in a filter cloth of 5 to 6 microspore size, into a clean container, then bottled in a transparent PET (polyrhthilene trephothalate) of 55micron thickness.

The extracted oil yield was expressed in percentage, which was calculated as weight of oil extracted over weight of the sample taken."

The frying performance of *Moringa stenopetala* seed oil extracted with solvent and with cold press was studied especially in regard to repeated frying. The oil was used for intermittent frying of potato slices and cod filets at a temperature of 175 degrees. The fatty acid contents, polar compounds, colour and viscosity of the oils all increased, whereas the iodine value, smoke point, polyunsaturated fatty acid contents, induction period and tocopherol contents decreased. 5

The effect of the oil on the organoleptic quality of these fried food and the theoretical number of frying operations possible before having to discard the oil was also terminated. The analytical and sensory data showed that the lowest deterioration occurred in cold press production oil.

8.3. Commercialization

Commercialization is often confused with sales, marketing or business development, whereas it is the process or cycle of introducing a new product, or production method, into the market. The actual launch of a new product is the final stage of new product development and the one where the most money will have to be spent for advertising, sales promotion and other marketing efforts.

According to Pingali and Rosengrant (1995) there are three levels of market orientation as far as production systems are concerned. The three levels are termed as subsistence systems, semi-commercial, and commercial systems based on the farm household objectives for producing a certain crop, their source of inputs, their product mix and their incomes sources. According to Govereh et al., 1995 “commercialization can be measured along a continuum from zero (total subsistence – oriented production) to unity (100% production is sold)”.

(Strasberg et al., 1999) suggested a measurement index called “Household Crop Commercialization Index” (CCI) which is computed as the ratio of gross value of all crops sales over gross value of all crop production multiplied by hundreds. Even if CCI has limitations, it can be used in practice especially in the context of developing countries where it is less likely to get smallholders selling all of their output and very large farmer selling none of their output (Govereh et al., 1999). In conclusion, the degree of participation in the output market is the conventional way to measure commercialization.

The benefits of commercialization are multifaceted. Von Braun et al., (1994) state that commercialization plays a significant role in increasing incomes and stimulating rural growth, through improving employment opportunities, increasing agricultural rural productivity, direct income benefits for employees and employers, expanding food supply and potentially improving nutritional status. In most cases, these increased incomes have led to increased food consumption and improved nutrition. Bernard and Spielman, (2008), observe that smallholder agricultural commercialization is significantly related with higher productivity, greater specialization and higher incomes”.

It is stated that the aforementioned outcomes give way to improvement in food security, poverty reduction and economy-wide growth.

Several researchers indicate that the outcomes of commercialization depend on whether efficient markets exist or not. If efficient markets do exist then commercialization leads to separation of

5 Frying stability seed oil *Moringa stenopetala*, Lolas S.; Goitzi O, Tsaknist J. 2006

6 cited in Leavy and Poulton, 2007

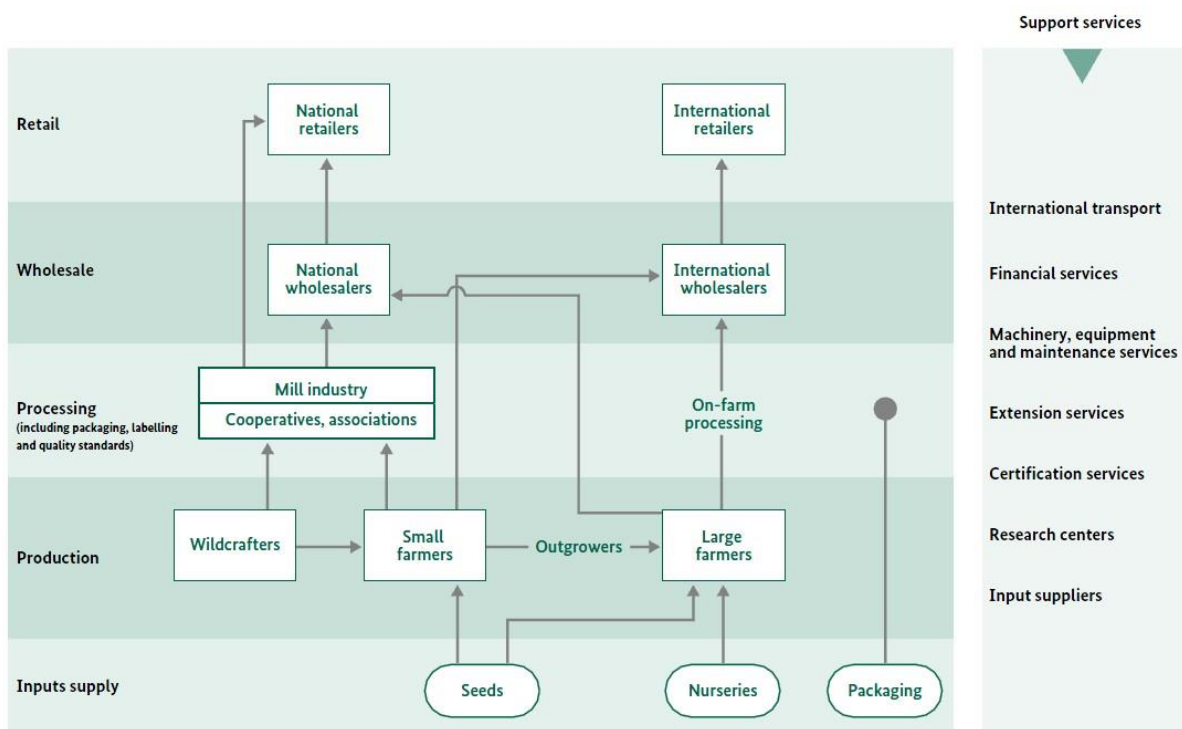
production from consumption, supporting food diversity and overall stability at household level and increased food security and improved allocative efficiency at macro level; but if markets remain inefficient and transaction costs are high, smallholder fail to exploit the blessing of commercialization (Bernard et al., 2007).

Samuel and Sharp (2007) pointed out that agricultural commercialization is a bridge through which smallholder farmers are able to achieve welfare goals. Various research undertakings reveal that the nutritional status of Moringa gives it high potential to address food and nutrition problems that is very much persistent in Ethiopia (Abuye et al., 2007). The development of its value chain helps improve supply of various products of Moringa both in rural and urban areas so as to get the benefits of Moringa in addressing the food and nutrition security.

Commercialization process has three key aspects:

1. The funnel: It is essential to look at many ideas to get on or more products or business that can be sustained long term.
 2. It is a stage-wise process, and each stage has its own key goals and milestones.
 3. It is vital to involve key stakeholders early, including the customer (promotion, advertising).
- Moringa is known worldwide, mainly the *Moringa oleifera* native of Asia. It was presented many years ago in the overseas markets, mostly in the States, North Europe, and Asia. Its unique nutritional value and traditional status of herbal medicine shapes Moringa’s brand. *Moringa stenopetala* is endemic in Ethiopia, in particular in the Southern Regions and this origin’s characteristics can add national and traditional value to its brand.

A wide specialist literature tackles on trading and marketing strategies, indicating that relevant commercial decisions depend on a certain number of specific conditions and variables; nevertheless, independently from the choices taken (groceries, supermarkets, general markets, virtual markets) it is *Moringa stenopetala*’s “native” brand which is the key for a successful story and several good practices to be spread at country level.



9. MAIN FEATURES OF THE MORINGA MARKET

9.1. Background Situation

Ethiopia is an agricultural country where large majority of people are engaged in cultivation of food crops and rearing livestock. Crops are produced for subsistence (Yisehak et al., 2010).

Despite an expected three-fold increase in food demand by 2050, East Africa can still deliver food security for all through a smart approach that carefully matches policies and technologies to the needs and opportunities of particular farming areas (K. Yisehak, M. Solomon and M. Tadelle, 2011). In the last two decades, per capita food production has been lagging behind the rates of population growth and food shortage and rural poverty has become chronic problems in Ethiopia (Kebele et al., 2007). In parts of southern Ethiopia, the consumption of wild food plants appeared to be one of the most important local survival strategies. Therefore, the nutritional problem of the rural poor in any country can be overcome either by strengthening the household resource base (Erhabor and Emokaro 2007, Ibrahim et al., 2009) or by diversifying alternate food sources (Ghosh, 2011).

Although Moringa is fast growing, drought tolerant and easily adapted to poor soils and arid conditions it has not received significant research attention to select and develop potential ecotypes that might be evaluable both as horticultural and medicinal crop. Because of its multiple uses and easy of propagation and ability to thrive under harsh environments, its acreage as a cultivated crop is on the increase, as is the demand for its products.

The demand for the Moringa in Ethiopian recipe is unidentified; even though Moringa provides nutritional support. The demand may be huge in future and it will create promised job opportunity not only for rural or farmers but also can see urban horticulture (Dr. Sreepada Hedge, Dr. Vijayalaxmi Hedge, 2013).

The commercialization of Moringa products in Ethiopia is still very informal and makes it difficult to get reliable information of production volumes and prices. To effectively exploit the existing market potential, the commercialization should become more structured and formalized. Thus, the coordination between producers, wholesalers and retailers should be improved in vertically.

Over the last decades, a growing middle-class population in Ethiopia, primarily in semi-urban and rural areas have brought about changes. Consumer tastes and lifestyle changes have an impact on eating habits. Exotic and imported food as well as health foods and organic foods are now in high demand by consumers. Moringa is a commercial crop; Authors say that has an ample scope to expand the Moringa 7.

Mulugeta Girma and Mingizem Birhan (2007) made "An empirical based analysis on the missed opportunity of Moringa marketing" in Eastern Part of Ethiopia, especially in Dire Dawa Administration.

The findings reveal that there is a good awareness, perception, interest and willingness to pay for Moringa, and a demand for the processed Moringa products is increasing though there is shortage of supply within the market with value added products. The Authors found that the bottle neck that

caused the project's failure was the lack of strong strategy guideline and special emphasis by the Local Administration. Lack of human powers and disintegration, and lack of organized work affected the project as well.

Fresh Moringa products – leaves and pods – are sold at the gate. Regarding the transformed products, being the market informal, is difficult to know how they (especially powder and tea) reach shops and supermarkets, in Addis Abeba and other towns. On the other hand, the presence of Moringa in shops and supermarkets of urban areas seems to demonstrate an interest by buyers and sellers. The MVC project aims at creating an integrated system that could become an example of good practices, from production to commercialization.

9.2. Vertically Integrated System

The major structural changes influencing world agricultural markets include increasing consolidation and market domination by large processing trading, and retailing firms, disappearance of traditional auction or spot markets.

In general, vertically integrated systems are desirable for empowering the system's structure and make linkages to the local and regional markets. For example, regarding the Moringa Value Chain project, contracts can be subscribed by individual farmers and/or cooperatives with certified seeds sellers (placed earlier) and with buyers of transformed products (powder, dried leaves, oil) later in the consumption system. Although contracts have been widely used in agriculture for a long time, their incidence is increasing and extending to the developing world and, further, amount of control exercised in large part due to the markets increasing demand for multifaceted product quality. Contracts are a device to surmount the information problems that can lead to lower product quality.

Contracts can also specify quality standards and thereby address adverse selection problems that might be caused by failure of the open market to adequately recognize and reward quality. Contract production can improve market efficiency and align production with the demands of the market for particular quality attributes.



9.3. Horizontally Diversified Trading

The role of horizontally diversified trading (supermarkets, groceries, general stores etc.) depends on the brand strategy, depending in turn, at national level, from local and regional geography, number and types of markets, rural or urban conditions, transportation and state of roads and other transportation facilities.

9.3.1. Supermarkets

The development of supermarkets in emerging countries is accompanied by increasing customer concern for food quality. The market control and cultural influence of supermarkets is not related simply to the size and extent of their operations, but also to the concentrated nature of the industry. This rapid industry rationalization and integration, across the supply chain, have an impact on small producers and processors (Delforce et al., 2005) and lack of competition.

Farmers' groups operating in the form of private commercial can have good opportunities acting regularly as suppliers of supermarkets. The ability to supply supermarkets is related to the combination of functions they make available to their members, especially with regard to promoting and controlling quality for which they receive public support. Supplying supermarkets via farmers' associations increase farmers' profit per kg., compared to traditional chains, but the quantities supplied to supermarkets remain limited⁸

Changes in farmer organization are not primarily in supplying supermarkets, but rather in public and international support for food quality improvement, which has been benefiting supermarkets.

The relation between safety and quality is generally discussed in the context of research on consumer risk perception. Quality and safety perception is linked to food choice and consumer demand addressing questions of price perception and the validity of willingness to pay measurements.

Food quality and safety are central issues in today's food economics.

9.3.2. Groceries

The term grocer, from the French *grossier* (meaning wholesaler), in turn derived from the Latin *grossarius*, from which the term gross (meaning a quantity of 12 dozen) is also derived. In the Middle Ages a grocer was a dealer of edible dry goods such as spices, peppers, sugar, and later cocoa, tea and coffee.

Nowadays a grocery store is a retail store that sells food. Small grocery stores that mainly sell fruits and vegetables are known as greengrocers. Greengrocers and small grocery stores that predominantly sell prepared food, such as candy and snacks, are known as convenience stores or delicatessen. Some grocery stores (especially large ones) form the centre piece of a larger complex that includes other facilities, such as gas station which often operate under the store's name.

Groceries specialized in the food of a certain nationality or culture, such as Asian, Italian, Middle Eastern are known as ethnic market-stands may also serve as gathering places for immigrants. In many cases, the wide range of products carried by larger supermarkets has reduced the need for such specialty stores.

Grocery stores operate in many different styles ranging from rural family-owned operations, to boutique chains and to larger supermarket chain stores.

Despite consolidation throughout the food market system, grocery retailers oftentimes with an international scope, have emerged as the dominant players in the food chain in most parts of the

⁸ Paule Monstrien et al., 2010 – Elsevier volume 35

world.

9.3.3. General Stores

Over time, as technology improved, and people began to specialize in producing certain goods, trading posts evolved into stores filled with a wide variety of common goods that many people needed. Such posts are called general stores.

While these types of stores might have gone by many different types of names, such as mercantile, emporiums, village shops, dealers, or even merchandise stores, they were collectively known as stores. Stores were where people would go to get just about anything and everything possibly needed, from food and clothing to household goods and even building supplies. Stores became the "one stop shop" for the communities they served. In fact, stores often catered to the specific needs of the community in which they were located. They also became hubs where people would gather to talk about local news, politics, and events of the day.

Over time, improvements in technology and the developments have allowed people to further obtain the specialized, mass-produced goods that they wanted. As a result, shops became much more common, as sellers decided to focus on a particular product instead of providing a wide variety of different products.

Before long, general stores became less common, as families went to the grocery store for food, clothing store for clothes, shoe store for shoes, and a variety of other stores for specific purchases. A walk through any modern shopping centre will reveal the many types of stores that exist today. Today's largest retailers and "big box" stores such as Walmart and Target have revived the concept of general stores by offering a wide variety of the most commonly-used products under one roof. By doing so, they offer shoppers the possibility of getting nearly everything they need in one place, which is attractive to many shoppers in today's busy world.

Nowadays, we are seeing a growing number of virtual on-line general stores that allow clients to select products at home, order on line and receive at home; Amazon is a good example. Among these products we find many types of supplement foods directed at sports activities, weight control and welfare in general. This is the kind of market that would be appropriate to know and verify as potentially interesting for Moringa products.

10. INTERNATIONAL MARKETS

10.1. Global Trading

India is the main supplier of *Moringa oleifera* worldwide. It accounts for about 80% of the global demand for *Moringa oleifera*. In India, most of the *Moringa oleifera* is produced on large plantations as a conventional ingredient. This makes it possible to sell the product at low prices. But there are

also big farms that produce organic Moringa, as AGF (Ancient Green Fields); they are the largest exporters of PKMI quality variety seeds and manufactured organic Moringa products making wholesale and bulk supply available to large numbers of organic farms around the world. AGF also sell online seeds, leaves powder, oil, and beauty creams (PKMI seeds are a variety rich in antioxidants).

An ancient Swiss farm (from 1903), famous for herbal cosmetics, sells on-line at the following prices (almost the same prices of AGM):

- 100 ml. Oil at 14,50 Euro
- 500 g. powdered leaves at Euro 17,50 p/ box, and offer 3 boxes at 20 Euros
- 250 g. tea at 8.50 Euro; 100 g. at 3,40 Euro
- 240 capsules p/ box 15 Euro
- 100 ml. cream from oil at 12,50 Euros

For smaller suppliers it will be very difficult to compete with the Indian companies' prices. Therefore, there is the opportunity to develop a Unique Selling Point (USP). This can be done with:

- High quality: European buyers are concerned about the quality of Moringa from India
- Certifications: for example, organic and/or fair trade
- Marketing story: for example, if the product comes from the work of smallholder farmers that aid rural communities to reduce malnutrition.

In recent years, more and more African companies have entered the market for *Moringa oleifera*, such as South Africa, Ghana, Mozambique, Kenya, Malawi.

These companies have differentiated their Moringa products from Indian products on the market by focusing on product quality and on having an interesting marketing story. There is also a on the island of Tenerife, which is part of the European Union. This company uses its European location as a Unique Selling Point (USP). Other upcoming producers are located in the Americas, such as El Salvador, Nicaragua.

European processors play a relatively small role in the Moringa value chain. Since Moringa leaves need to be processed close to harvesting, most processing takes place in the country of origin. European processors can be involved in the standardisation of Moringa leaf powder, just as the Indian companies that also compete at this level of processing. Some also produce ingredients registered as intellectual property. For example, the company Sabinsa developed a standardised ingredient for *Moringa oleifera* leaves with a minimum level of antioxidant activity. Indian companies also produce final products based on *Moringa oleifera*.

10.2. The European Market, an Overview

Moringa stenopetala can be defined a "novel food", it is an agro-forestry tree, endemic in the Ethiopian Southern Region, North Kenya, Somalia. While *Moringa oleifera*, of Indian origin, has been studied at length, which made it gain national quality standards and all the certifications required for international trading, *Moringa stenopetala* has not been studied as much so far, and its genetic profile is still little known to establish a national quality standard of its seeds.

Novel Food is defined as food that has not been consumed to a significant degree by humans in the EU prior 1997, when the first Regulation on Novel Food came into force (Regulation EC n. 258/97). Novel food can be newly developed, innovative food or food produced using new technologies and production process as well as food traditionally eaten outside of the EU.

Novel food must be:

- safe for consumers
- properly labelled as not to mislead consumers.

The 25 of November 2015 a new Regulation was adopted on the basis of a procedure fully centralised at EU level, which should enable safe and innovative food be placed in the EU market. It will come to effect in January 2018.

Request for an Authorization and Risk Assessments

To market a novel food, companies must apply to a Member State's competent authority for an authorization, presenting scientific information and safety assessment reports.

If a Commission decision is needed, the Commission asks the Standing Committee on Plants, Animals Food and Feed for an opinion.

The Notification Procedures

A novel food may be marketed through a simplified procedure called "notification" (Art. 5 of Regulation EC n. 258/97).

Specific additional requirements for the labelling of novel foods may also apply, if necessary to properly inform the consumers. The label must mention the name of the food, and must, when appropriate, specify the condition of the use.

Any nutrition and health claim should only be made in accordance with the Health and Nutrition Claims Regulation n. 1924/2006.

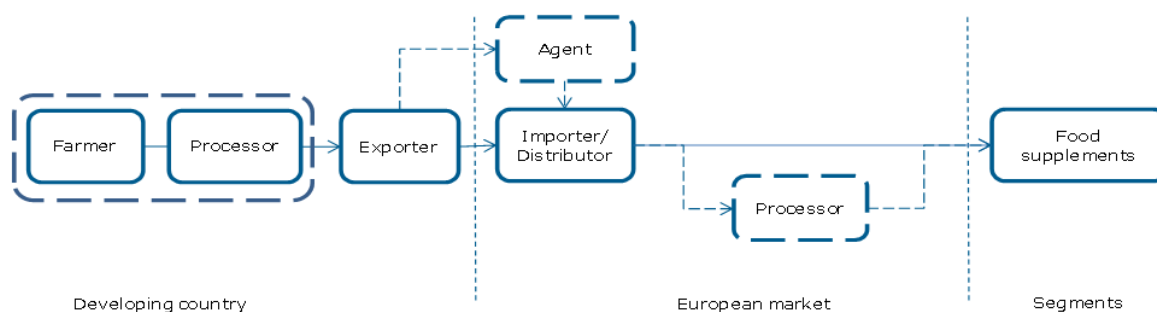
Hazard Analysis and Critical Control Points (HACCP)

HACCP system addresses food safety through the analysis and control of biological, chemical and physical hazards from raw material production, procurement and handling, to manufacturing, distribution and consumption of the finished product. Amongst the objective of the Moringa Value Chain Project, there is the acquisition of all the required conditions to enable *Moringa stenopetala* getting legal access to the national and European market. Regarding the latter, it is envisaged a collaboration between the Italian Istituto Superiore di Sanità (ISS) and Ethiopian Public Health Institute (EPHI).

Due to the fact that nutritional values are very similar in both the Moringa species (*oleifera* and *stenopetala*), both rich of vitamins, minerals, amino-acids, and antioxidants, following is an analysis of the Moringa *oleifera* placement on the European market, which can help figure out how *Moringa stenopetala* could be placed on the same market.

Moringa oleifera is increasingly popular on the European market for food supplements. The plant's dried leaves are marketed for a wide range of health benefits. These benefits are based on their high level of antioxidant activity and chemical composition. India is currently the main global supplier.

10.3. European Market Channels



Market channels for Moringa oleifera for health

Source: ProFound

Importers and distributors are the most important entry point into the European Moringa market (see Figure). They may trade in up to 500 natural ingredients, together with other (synthetic) ingredients. They focus on global sourcing, analysis and quality control, certification, blending, product documentation and sales to processors and end-product manufacturers.

Small exporter and/or new exporters to the European market can also work with an agent who represents the firm in the market.

10.4. End-market Prices for *Moringa Oleifera*

As the main supplier of *Moringa oleifera*, India dictates the global prices for the product. It will be difficult to compete with the prices of large-scale Indian producers of *Moringa oleifera*. As Indian companies operate on a large scale, they can offer low prices.

Wholesale prices for *Moringa oleifera* leaf powder from India (€5.88 per kg).

10.5. Products Description

Just as *Moringa oleifera*, *Moringa stenopetala* seeds have a long history of use for water purification in Africa and in South and Central America. However, they are not commonly used in Europe.

Moringa oleifera is marketed as a 'superfood' on international markets. The leaves have a high level of antioxidant activity, which research indicates as similar to acai and blueberries.

Moreover, the leaves have a beneficial chemical composition. This is reported in several studies of the *Moringa oleifera* monograph of the African Herbal Pharmacopoeia.

The leaves are high in:

- Vitamins: A, B, C and E
- Minerals: iron, calcium, selenium, phosphorus and potassium
- Essential fatty acids: omega-3 and omega-6
- Protein

- Fibre

Based on this composition, *Moringa oleifera* leaf powder is commonly marketed as:

- Supporting immune health
- Improving general health
- Increasing energy levels
- Supporting weight management

The table below shows the use and classification of *Moringa oleifera* on health products. Several European countries (or groups of countries, such as Belgium, France and Italy in the case of “BELFRIT agreement”, have established positive lists of species which are allowed to be used in food supplements. It has to be noted that species allowed for use in food are not necessarily allowed for supplements (for example in concentrated form).

Table below: Use and classification of Moringa oleifera in health products

FOOD SUPPLEMENTS	The whole plant of <i>Moringa oleifera</i> is allowed in food supplements according to the BELFRIT list. It is not in other National positive lists, and not on the German list for food supplements. Leaves powder and oil are listed on the Italian list.
HERBAL MEDICINAL PRODUCTS	In Europe, <i>Moringa oleifera</i> is not allowed in herbal medicinal products.
Chemical Administration Service classification number	93165-54-9
European Community classification number	296-941-1

11. MARKET SEGMENTS TO TARGET

11.1. Food Supplements

The whole plant of *Moringa oleifera* is allowed in food supplements because it is listed in the BELFRIT list. This indicates that it can be used in food supplements in Belgium, France and Italy. Although *Moringa oleifera* it is not listed in other national positive lists, industry experts expect that this should not be a problem when selling the product in Europe.

The similarity between *Moringa oleifera* and *Moringa stenopetala* - genetic profile and nutritional value - and still being *Moringa oleifera* in a country of the BELFRIT agreement (Italy), facilitates the entrance of *Moringa stenopetala* in the European market.

In food supplements, *Moringa oleifera* is commonly sold as:

- Leaf powder (also marketed as food product)

- Capsules containing leaf powder

The seeds and oil of *Moringa oleifera* are not commonly used in European health products. They are, however, listed on the Italian national positive list. This list includes the following properties and effects of the seed and oil:

- Digestive health
- Normal blood circulation
- Weight management
- Respiratory health
- Regulation of perspiration

Moringa stenopetala seed edible oil could compete in the market, starting from BELFRIT countries. Producers of food supplements cannot make medicinal claims.

11.2. Novel Food

Current legislation:

Authorization and use of novel foods and foods ingredients have been harmonized in the European Union since 1997 when Regulation (E.C) n.258/97 on Novel food was adopted.

Novel food is food not consumed to a significant degree in the European Union prior to 15th of May 1997 and which falls under one of the categories listed in the Regulation.

New rules for novel food:

In 2008, the commission presented a proposal to amend the Novel food regulation. In 2011 the co-legislative procedure discussion provoked around a “cleaning issues “and no agreement was reached between the European parliament and Council. As results, the commission was asked to prepare a separated legislative proposal. In 2013, the commission presented a proposal for a regulation. Under the draft, Novel food would be subject to a simpler, clearer and more efficient authorization procedure fully centralized at E.U. level, which should enable safe and innovative food to be placed on the E.U. market without compromising a high level of public health. The regulation was adopted on 25th November 2015.

The new novel food regulation:

The new regulation aims to improve conditions so that businesses can more easily bring new and innovative foods to the E.U. Market, while still maintaining the high level of food safety for European consumers. It offers the benefit of a broader choice of food and a more favourable environment for Europe's agro-food industry, the second largest employments sector in Europe to benefit from the innovation, which in turn is good for growth and jobs.

The 2015 food regulation (E.C.) states that Novel food can be newly developed, innovative food or food produced using new technologies and production process as well as food traditionally eaten outside of the E.U.

Novel food authorised in the E.U.:

Between 1997 and 2014, there have been around 170 applications for authorisation across the E.U. (7-10 application/year). So far around 90 Novel foods have been authorised for use. Novel food is

subject to the general labelling requirements laid down in Regulation (E.C.) n. 1169/2014
Condition for authorisation

Novel food will only be approved for use in the E.U. if they do not present a risk to public health, are not nutritionally disadvantageous when replacing a similar food and are not misleading to the consumer. They must undergo a scientific assessment prior to authorisation to ensure their safety. The authorisation supports the condition for their use, their designation as food/food ingredient and labelling requirements.

Novel food labelling:

Novel food is subject to the general labelling requirements laid down in regulation E.C. n. 1169/2011. The label must mention the name of the food and when appropriate specify the conditions of use. Any nutrition and health claim must be compatible with the Health and Nutrition Claims Regulation (E.C.) n.1924/2006.

It is advisable to apply for *Moringa stenopetala* powdered leaves and oil to be introduced in the European market as a Novel food.

11.3. European Market Perception

There is a strong demand for Moringa because of a changing perception of health.

A changing understanding among consumers of what it means to be healthy is driving consumption of Moringa. European consumers use health products to prevent diseases and to feel good, for example by adding supplements to their regular diet. This is translated into a growing market for food supplements. The European food supplements market is expected to grow in the coming years; grow by 9.5% annually from 2015 to 2020. More specifically, there is a growing demand for food supplements that support the immune system. European consumers link the immune system to preventive health. This opens up opportunities for Moringa supplements.

In Europe, supplements that support immune system health and general health are very popular. Their popularity differs depending on the specific European market. For example, in 2013, food supplements that support the immune system had a relatively grow in: Germany (20%), The United Kingdom (14%), France (14%) and Italy (12%).

The term “superfood” is not an authorised health claim in Europe. European companies can only use this term on their label if it is part of their brand name.

The changing perception of health also leads to consumers using energy products to support an active lifestyle. There is a growing demand for these products worldwide, which offers opportunities for Moringa. Especially energy drinks and food supplements, that offer an alternative source of energy to caffeine, are increasingly popular among European consumers.

Globally, this market is expected to grow by 10% annually from 2014 to 2020. In 2020 it is expected to reach \$66 billion (€59 billion) (International Trade Centre).

The growing rates of obesity and increasing awareness of the importance of healthy lifestyles is leading to a rising global demand for weight-loss supplements. This market is expected to grow from 2016 to 2020.

11.4. Interest in Organic and Fair Trade-Certified Moringa

Although the total European market size is small, there is a good demand for organic Moringa; so *Moringa oleifera* and *stenopetala*. Fair trade certification can also help to show buyer that the production much so that industry experts indicate that global supplies of organic certified leaf powder

are insufficient. This opens up opportunities for (new) producers who can supply organic ingredient is generating rural income and does not harm local communities.

It will be appropriate to contact exhibitors of the organic fair-trade Biofach, or search organic importers on the website of the International Trade Centre. Buyers might ask to support claims with certification or documentation or sourcing practices and/or Corporate Social Responsibility (CSR) practices.

11.5. Requirements for Moringa to be allowed on the European Market

Moringa needs to be sustainably sourced and needs to make sure that it can supply a stable supply of Moringa to buyers, both in terms of quality and quantity. This may make it easier to compete with suppliers in India that grow *Moringa oleifera* on large plantations. Moringa can only be exported to the European food supplements market if the seller complies with the legal .

Many buyers have additional quality requirements. These can go beyond legislation and standards. They are established in buyer specifications.

Examples are requirements related to:

- Active ingredient content
- Moisture content
- Contaminants
- Residues

To show the interest in meeting the specifications of buyers, it is necessary to develop well-structured company and product information. This includes detailed Technical Data Sheets, as well as process and product certifications.

STANDARD	PARTICULARLY RELEVANT FOR	MAIN OBJECTIVES OF THE STANDARD	CERTIFYING ORGANISATIONS
GLOBALG.A.P.	Export-oriented medium and large scale agro-industries and producer groups	Improvement of food safety and traceability of products	e.g. Ecocert Southern Africa
Organic	Small, medium and large scale producers	Improvement of food quality and safety and environmental conservation	e.g. Ecocert Southern Africa; AFRISCO
Fair trade	Small scale producers that are organized in associations and producers with an organized labour force	Improvement of the trading and, thereby, living conditions for producers in developing countries; promotion of the concept of sustainability	Private fair trade organizations, such as FLO-CERT

Table 2: Selected voluntary standards relevant for exports to the EU

Source: GTZ

11.6. Requirements for Niche Markets

Standards and requirements for social and environmental sustainability include:

- Organic production

- Verification and/or certification of sustainable production (natural resources sustainability)
- Company and supplier codes responsibility

European food industries increasingly demand compliance with quality and food safety management. Examples include:

- required for health ingredients
- food safety
- risk management
- Hazard Analysis Critical Control Point
- Additional requirements

Commonly used plants for immune support include:

- Echinacea (*Echinacea purpurea*)
- Ginseng (*Panax quinquefolius* and *P. ginseng*)
- Green tea (*Camellia sinensis*)
- Ginger (*Zingiber officinale*)
- Cat's claw (*Uncaria tomentosa*)
- Eleuthero (*Eleutherococcus senticosus*)

Other 'superfoods' and in particular superfood powders are also strong sources of product competition. These are often used to improve general health or immune support, especially if these boast a healthy nutritional profile, such as vitamins, or high levels of antioxidant activity.

Examples include:

- Baobab fruit powder (*Adansonia digitata*)
- Spirulina (*Arthrospira plantensis*)
- Barley grass powder (*Hordeum vulgare*)
- Wheat grass (*Triticum aestivum*)
- Maca (*Lepidium meyenii*)

Substitute products for *Moringa oleifera* are used to increase energy: There is a wide range of products on the European market for energy-boosting supplements. These include both synthetic and natural alternatives.

The main synthetic alternatives are:

- Caffeinated energy drinks
- Vitamins and minerals
- Protein-based products

Natural alternatives are increasingly popular to increase energy. Most of these ingredients are also marketed for other health benefits, such as boosting concentration.

These include:

- 'Super-fruits', such as guarana fruit and goji berries
- Botanicals, such as yerba mate, *Rhodiola rosea* and green tea
- Other natural products, such as royal jelly

Substitute products for *Moringa oleifera* used against obesity: Consumers use different types of products for weight management, both natural and synthetic.

These include:

- Protein-based products are a strong force of competition. These can be natural or synthetic. They support a feeling of fullness, while they have a low content of carbohydrates and fats.
- Probiotics are strong competitors as well, in particular as they are used for wider digestive health applications.
- Flaxseed oil and other omega-3 oils: These are popular because they also help support the digestive system and healthy cholesterol levels.
- Fruits: Some fruits are used for their laxative properties, for example.

12. QUALITY STANDARDS AND CERTIFICATIONS

Moringa stenopetala quality standards, regulatory framework, safety certifications, GAP, GMP are needed to formally enter in national and international markets.

At present there are no official local certification bodies/laboratory facilities operating in the country, though Moringa Value Chain Project (MVC) will support collaboration between Ethiopian Public Health Institute (EPHI) and the Italian Istituto Superiore della Sanità (ISS). The ISS will contribute to the project through scientific capacity building and technical assistance to EPHI and Ethiopian Food Medicine and Health Care Control Administration (EFMHCCA).

The areas of collaboration will be the following:

- Analytical skills for the maintenance of the composition standard, with particular regard to the substance having a health effects;
- Analytical skills for the determination of contaminants in the food preparation derived from *Moringa stenopetala*;
- Scientific capacity and knowledge to EFMHCCA regarding the regulatory framework for the harmonization of the production of Moringa based-food.

The ISS is a public research Institute and represents the leading technical body of the Italian National Institute of Health. ISS is structured in 17 National Centres including two National Reference, 6 Department, 5 Technical Scientific Services and 1 Notified Body.

Its activities include research on health issues, control of drugs, foods, vaccines and topic concerning products for use in public health. In addition, it organizes training courses and provides consulting service in the view of public health protection.

13. COOPERATIVES IN AGRICULTURE

13.1. The role of Agriculture Cooperatives

One of the key elements of agriculture towards more commercial agriculture is that the market mechanism become more important, for many aspects, of the farming system; not just for selling farm products but also for obtaining proper inputs, credit, equipment and temporary labour, market become the dominant coordination mechanism.

As the cost of using the market mechanism is relatively high for smallholders, collective action may be a beneficial strategy for realising economies of scale and scope. (9 Given that physical availability of inputs is often an important constraint to access with thin and unreliable rural distribution, cooperatives act as a vehicle for input distribution (Darward, Kyed, 2014).

In 2010-2011 and 2015-2016, the Ethiopian Government started the Growth and Transformation Plan (GTP) towards fostering broad based development in a sustainable manner; while the GTP foresees a central role for agriculture cooperatives in increasing the productivity and household income of smallholder farmers.

In the 90ths, the Government designed various policies to strengthen the development and operation of cooperatives. The first formal legal framework was the Agriculture Co-operative Societies Proclamation 85/1994 replaced by CSP 147/1998. In 2008 the Ethiopian Commodity Exchange (ECX) was established as a formal institution to improve co-ordination in agri-food markets and to enhance small holders market integration.

Cooperative promotion started with the Federal Ministry of Agriculture (MoA) of developing and implementing policies on Cooperatives. One level below is the Federal Cooperatives Agency (FCA). FCA establishment in 2002 plays a crucial role in the registration and legalization of co-operatives, by auditing and certifying them and monitoring their performances.

Another important Government Agency is the Agriculture Transformation Agency (ATA) (2010). The agency promotes cooperatives and agricultural transformation. ATA also takes assignments on reducing systemic bottlenecks in agriculture development.

ATA has been assigned the task of developing “an integrated strategy that will enhance the support of agricultural Co-operatives to contribute towards increasing the yields and incomes of smallholder farmers “(ATA, 2012).

At the Woreda level, two agencies are supporting co-operatives: The Woreda Bureau of Agriculture and Natural Resources (BoANR) and the Woreda Cooperatives Promotion Office.

Development Agencies (DAs) are mainly targeted to provide technical support to primary co-operatives.

As part of its rural development assignments, the BoANR provide agriculture extension activities and crop production. There is a different role between primary cooperatives and co-operatives unions. The co-operatives unions are the key organizational level for smallholder because the Unions make the actual link to domestic and foreign buyers.

Many NGOs are actively supporting Unions and primary cooperatives; an example is Cooperatives for change (C4C) program of the Dutch NGO, financed by the Gate Foundation.

13.1.1. The Cooperatives Principles

Authors define a cooperative as “an autonomous association of persons united voluntarily to meet their common economic, social and cultural needs and aspirations through a jointly-owned and

democratically-controlled enterprise.

“A coop is an enterprise formed by a group of people to meet their own self-defined goals. These goals may be economic, social, cultural, or as is commonly the case, some combination.

In a cooperative, only participants who have met the requirement for membership are allowed to be owners. All cooperatives operate on the principle of “one member, one vote”, so control is allocated evenly among the users of the coop without regard to how much money each has invested. Cooperatives operate for the benefit of members, and those benefits are distributed in proportion to each member’s transaction with the cooperative. In a coop, the answer to the question of “who owns, who controls and who benefits from the enterprise?” is always the same – the cooperative members.

All the cooperatives, no matter the size or sector, adhere to a common set of principles expressing their foundational values of democracy, equality, equity, self-help, self-responsibility and solidarity.

The principles are the following:

1. **Voluntary and Open Membership:** Cooperatives are voluntary organizations, open to all people able to use its services and willing to accept the responsibilities of membership, without gender, social, racial, political or religious discrimination.
2. **Democratic Member Control:** Cooperatives are democratic organizations controlled by their members – those who buy the goods or use the services of the cooperative-who actively participate in setting policies and making decisions.
3. **Members’ Economy Participation:** Members contribute equally to, and democratically control the capital of the cooperative. This benefits member in proportion to the business they conduct with the cooperative rather than on the capital invested.
4. **Autonomy and Independence:** Cooperatives are autonomous, self-help organization control by their members. Any agreements with other organizations or external sources of capital ensure democratic control by the members and maintain the cooperative’s autonomy.
5. **Education, Training and Information:** Cooperative provide education and training for members, elected representative, managers and employees so they can contribute effectively to the development of their cooperative and inform the public about the nature of benefits of cooperatives.
6. **Cooperation among Cooperatives:** Cooperatives serve their members most effectively by working together through local, national, regional and international structures.
7. **Concern for Community:** While focusing on member needs cooperatives work for the sustainable development of communities through policies and programs accepted by the members.

13.1.2. Equity and Essential Issues of Ownership

Ownership of any enterprise generally yields the rights to a certain degree of control of that enterprise. Ownership is also linked to what in finance are called “residual claimant rights” which are rights to a particular share of company net income while operating, or a claim of divided assets if the company is dissolved. In most companies, the more money a person invests the more equity in the

business he or she would own. Both control and financial rewards are driven by the amount of money invested and the more of one, the more of the other.

Cooperatives are distinguished from other organizations in that member use, or patronage is linked to control of the enterprise, rather than the degree of monetary investment. Any financial return to cooperative owners typically comes through profit allocations based in their patronage, or transactions with the cooperative. This is very different from an investor-owned firm where it is not necessary to transact any business with the enterprise in order to benefit from it as an owner. In an investor-owned firm, return comes through funds invested, not services used.

The amount of equity (and subordinate's debt) that can be supplied by members will in turn influence the amount of debt the cooperative might raise and therefore the total capital available to start operations.

13.1.3. Cooperative Members Equity Structure

Start-up capital can be some of the most challenging to secure because the coop has no operating history to rely on. Cooperatives typically finance their start up needs with a combination of debt from lender and at-risk equity investment from coop members.

Through their purchase of shares of stock from the cooperative, members provide the equity capital that the cooperative enterprise needs to launch and grow.

Cooperatives can provide benefits to members in a wide variety of ways, both economic and not economic.

Cooperatives are economic enterprises, but they are not driven by investment return. They are designed to provide member benefit, but that benefit may be defined and derived in a myriad of ways, social and cultural as well as economic. And even within the economic sphere, cooperatives typically also offer their members a wide variety of benefits in place of or in addition to, the financial returns they receive based upon their patronage. Among them: Group purchasing discounts, Access to market and anti-monopoly force, Training, Better information and technology, Shared risk, Innovation.

13.2. The Wezeka Cooperative

The Moringa Value Chain Project represents the Pilot phase of a broader program previously identified and evaluated. One of the main purposes of MVC project is the constitution of a new cooperative in Arba Minch Woreda. It is going to be a primary multipurpose cooperative for the production and processing of *Moringa stenopetala* products.

The MVC project will last one third of the time allocated for the whole initiative, and will start all of the already identified sectors, which objectives are as follows:

- Improvement of nutritional conditions of the community based on scientific criteria;
- Empowerment of women skills and roles within an organized production system,
- Improvements of economic conditions and standard of living of the community by meeting the stated objectives and strengthening its productive activities.

All the actions envisaged to meet the objectives of the project will take place in an ecosystem-based, institutional, social and productive environment already identified by the previously carried out study. The general scope of this project is to demonstrate how a "friendly" use of land and natural

resource biodiversity management, can meet the needs of local communities. The start-up of a primary multipurpose cooperative will demonstrate to the community how a well-organized model of agricultural production and value chain activities can be a concrete opportunity for human, social and professional development.

Common cross-cutting actions towards achieving the above-mentioned objectives are as follows:

- Involvement of all stakeholders in a constant participation and awareness of the project strategies and its time course.
- Provision of coaching and training for all technical and agricultural activities of Wezeca Cooperative.

13.2.1. Cooperative Organization and Administration

13.2.1.1. Juridical Features

In PART 1, point 2 of Cooperative Societies Proclamation – Proclamation No.985/2016

Definition:

1/ “cooperative society means an autonomous association having legal personality and democratically controlled by persons united voluntarily to meet their common economic social and cultural needs and other aspirations, which could not have addressed individually, through an enterprise jointly owned and operated based on cooperative principles;

2/ “primary cooperative society” means a cooperative society established by individuals having similar interests and objectives with a minimum number of members prescribed in this Proclamation to produce, provide service or to engage in both activities.

The main features of cooperatives are the following:

- a) each shareholder has the same rights as everyone and everyone has the right to vote independently of whether he contributes to the cooperative's business or not
- b) membership or withdrawal from the cooperative is voluntary
- c) distribution of surplus to shareholders in proportion to their work
- d) the mission of the cooperative is directed to meet the needs of the members
- e) the cooperative offers, facilitates and manages technical assistance services to its members.

In PART 2 of the Proclamation, the fulfilments are established for:

The Cooperative Society's Constitution, Type, Denomination, Registration, Juridical Personality and Responsibility, and By-laws.

13.2.1.2. Procedure for the Cooperative’s Constitution and Registration

The General Assembly must be formed by members of the Society interested in actively participating in the mandate of the Cooperative and its objectives.

A Management Committee composed of three members is elected by the members of the Assembly, of which the legal representative shall be the President of the Cooperative. The Committee will seek

a cooperative management course for members, at the competent institution.

The next step is the elaboration of the Business Plan which describes how the capital needed to start the business will be obtained, how it is organized, how it plans to fund the development of the activities and of the business, and the indicated benefits.

The components of the Business Plan are the following:

- a) General information: Name of the Cooperative Society, its location, address, telephone number, fax, e-mail
- b) Organizational structure: the organizational chart of the cooperative, as shown in the designated form, must meet the law requirements
- c) Market: Indication of the target market that you want to reach with products and / or services.
- d) Competition: Specify the main competitors that trade *Moringa stenopetala* products.
- e) Specify the total inversion amount and the source of funding.
- f) Indicate the main features of cooperative actions regarding productive investments and supply possibilities
- g) Describe the main sales strategies that are intended to be used.
- h) Indicate the personal information of the person who carried out the Business Plan.

The sixth stage for the Cooperative's legalization is the implementation of the basic course of cooperative associationism. The course will cover: cooperative doctrine, administration, economic and financial areas, legal.

The Management Committee prepares the Statute of the Cooperative.

The Statute must contain:

- The Cooperative's entire data and legal regulations under which the cooperative will operate, and the calendar of General Assembly meetings.
- Enactment of the General Assembly of the Wezeka Cooperative.
- Request of the cooperative to have legal personality to the competent Authority.
- Legal recognition of the Cooperative Society by the competent Authority, and request for credentials of the legal representative.

The credentials to be submitted are: the name of the representative partner, its position in the cooperative society, its date of his entry into the cooperative, and its credential term date.

Following are the required elements to begin the product registration process in the Food Health Register:

- a) the product quantification formula, signed by the executor of the formulation
- b) original product labels must be presented
- c) the activity license must be submitted
- d) presentation of the product and its characteristics, samples of the product.

13.3. Cooperative Organization – Strategy

Defining the strategies, at the start-up phase of the business, provides the framework on which organizational decisions will be based. At this point, it is about establishing:

The Mission, the Vision, the Objectives, the Policies.

13.3.1. The Mission

Wezeka Cooperatives produces and transforms *Moringa stenopetala* products; new products processed with quality standards that can offer the best of this exceptional plant.

13.3.2. The Vision

Being a leading national and international cooperative for the production and processing of *Moringa stenopetala* products, helping to reduce the index of national malnutrition and to propose new alternatives for the well-being of people, with high-quality nutritional products.

13.3.3. Objectives

- 1) Placing on the national and European market *Moringa stenopetala* plant products of the highest quality, safe, and preserving the exceptional nutritional value.
- 2) Contributing to reducing domestic and national malnutrition and improving living standards of the communities in the Southern Region and in Ethiopia, who are the ultimate beneficiaries of the initiative.
- 3) Creating a model of development through the project to help spread broad and accurate information on the exceptional properties of this plant, which has the merit of having a positive impact on everyone's health, especially children and adolescents in the age of development, pregnancy and breastfeeding women.
- 4) Intensifying recovery of fertile land and contributing to increasing the availability of healthy and safe food through organic production, supported by the Government since 2006, by Proclamation No. 488/2006 to establish "The Ethiopian Organic Agriculture System"
- 5) Recognizing and enhancing women's capacities, from production and transformation to business and management, concrete situations while still projecting towards a better and fair future.

13.3.4. Politics and Regulations

Wezeka Cooperative has to equip itself with: sales strategies, work salary politics, production methods, and safety standards. Sales strategy and, mainly, safety standards will be elaborated consistently with the results of EPHI-ISS-EFHEMACA cooperation

13.3.5. The Implementation Process

In order to separate the numerous activities that a company performs using the value chain model, companies must follow a number of steps:

- 1) Organize meetings with all the line managers in charge of the different functions of the company.
- 2) Introduce them to the concept of value chain as an activity-based view of the cooperative and

exploring way it is important.

- 3) Ask each manager to prepare a report (for their own department) exploring the different activities they perform, and how these activities connect with those of the other departments. Underlie possible problems and suggest potential solutions.
- 4) Collect all the reports and determine whether the activities performed by the different departments are consistent with the overall strategy of the cooperative. When possible identify communications between the activities highlighted.
- 5) Share the results of the analysis with the board. Prepare a formal document assessing the plan of action to improve the overall organisational structure of the cooperative.

13.4. Requirements for Lease Financing

For its starting up, Wezeka Cooperative will require for lease financing to a bank.

Bank and finance lease services to applicants who want to lease their capital base and useful excursion vessel type, quoting the Office should provide OOPS. To apply the lease the cooperative will fill a specific form (attached to this document), giving to the bank all the needed information; the lease must be registered in the relevant body.

The 30% of the requested amount will be provided by cooperative members and 70% by long-term financing.

A share of the 30% will be composed by the, monetized, in kind contribution of the members in providing Moringa production activities (excluding plantation and harvesting), free of charge. The remaining 70% will be given by the bank under the soft loan scheme, applying an interest of 8%.

14. WOMEN IN THE PROJECT CONTEXT

Agriculture is closely linked to food security in rural parts of many African countries and in Ethiopia. Change in agriculture productivity- both direct and indirect- have implications on nutritional outcomes.

Various ways through which increase in agricultural productivity can translate to change in nutritional outcomes, for examples:

- increased food for own consumption,
- increase in income
- reduction in market prices
- change in preferences
- a shift in the control of resources within the households.

In all these five pathways, gender roles have a significant influence. As a matter of fact, intra-household resources allocation has a considerable role to play in nutritional outcomes. The extent to which women have access to and control over resources largely determines the kind of care they provide for their children. Women's lack of control over household resources, time, knowledge, and social support networks constitute a major barrier to improving poor nutritional outcomes in Ethiopia (IFPRI 2012).

Empirical researches have also shown that women's greater control in household has an impact on

the nutritional and educational outcomes of children.

The linkages are complex, and the direction of relationship between women's status and nutrition are not always straight forward. For instance, women's empowerment through engaging in agriculture or other paid work could reduce the amount of time available for them to take care of themselves as well as their children but having a positive income effect.

For many reasons measuring women's empowerment is not straight forward and quantifying the linkages between women's empowerment and nutritional outcomes depends on the measurement of empowerment.

This pilot project- Development of Moringa Value Chain in Rural communities – aims at looking into the relationship between women's empowerment and nutritional outcomes of both women and children in the Southern Region of Ethiopia. This objective can be facilitated through appropriate research methodology.

14.1. Gender and Nutrition

Women often face barriers to optimizing nutritional inputs, and these barriers differ from those they face when participating in production activities. Social norms may dictate who has first access to food, what women and children can eat, and how or when health care is accessed; or despite her primary role in raising poultry, for example, a woman may be instructed by her husband to sell all the egg rather than to reserve some to feed them to their child.

Moringa products, with its unique nutritional content, may potentially give good incomes to the household. These various contexts suggest getting the project opportunity to look into the relation between specific women conditions and nutrition and identify the related framework.

In March 2015 IFPRI (International Food Policy Research Institute) and EDRI (Ethiopian Development Research Institute), in the occasion of Agricultural Economics Society of Ethiopia 15th Annual Conference, presented the Women, Empowerment in Agriculture Index (WEAI).

The Women Empowerment in Agriculture Index (WEAI) is used to measure women's empowerment. The Index was developed by researcher of IFPRI, the Oxford Poverty and Human Development Initiative (OPHI) and USAID. WEAI is based on the survey on five domains: Production, Resources, Income, Leadership, and Time.

This methodology may provide a good base to project's survey on this matter, being also instrumental to Monitoring and Evaluation activities.

The questionnaire used for the survey includes modules on:

- basic demographic information (still done by the Inception Phase of this project);
- household consumption expenditure;
- women empowerment indicators;
- women dietary;
- diversity and anthropometry;
- child anthropometry and infant and young child feeding;
- employment, agricultural productivity and input use;
- other relevant information.

The Index is composed of two sub-Indexes: the Five Domain of Empowerment sub-Index (5DE) and

the gender parity sub-Index (GPI). The 5DE measures the empowerment of women in the five areas mentioned above (90% of the total WEAI; and the Gender Parity Index measures the average level of equality in empowerment of men and women within the household (10% of the total WEAI). Guide to WEAY and indicators modules are attached to this document.

14.2. Methodologies and Indicators in Gender Participatory Approach

Methodologies are a combination of theories, concepts and selected observations techniques (Pelto, 1990). In this context, the terms “methodology” and “framework”, are often used interchangeably. Observation techniques are tools of methodologies. Indicators are criteria or measure against which changes can be assessed (Im-Act, 2005); they may be pointers, facts, numbers, opinion or perceptions used to signify changes in specific conditions or progress towards particular objectives (CIDA, 1997). Gender indicators measure gender related changes over time. They can be quantitative based on disaggregated statistical data, which provide separate measures for men and women, on literacy, for example.

Gender indicators can also capture qualitative changes, for example increases in women levels of empowerment or in attitudes changes about gender equality. To generate richer data, a combination of quantitative and qualitative indicators is advisable.

In the case of Wezeka cooperative context, the suitable approach seems to be participative, means that women and men will participate together in gender discussions, seminars, operational training and capacity building. A significant part of indicators will emerge from these participative activities.

14.3. Women at the Wezeka Cooperative

Women, and rural women in particular, have less access to resources, education, training, credit, capital, land, and leadership roles than men. As a strategy, the project will require the conscious involvement of both, women and men, and ask them to share, together with their families, all those aspects that connect project actions to their real life.

General objective of MVC Project is to fully develop the exceptional characteristics of Moringa to meet the objective needs of the population, starting from Gamo Gofa Woreda and Wezeka Kebelé. The Cooperative is going to act as the facilitating factor both for the production and trading of the plant's derivatives, as well as for its health benefits on children, adolescents, and women, the latter especially during pregnancy and lactation.

Of the 110 beneficiaries of the project activities, 98 are women. Currently, during the inception phase, men and women are following training courses for *Moringa stenopetala's* cultivation, processing of its products, and marketing activities (packaging, labeling, etc).

These courses will be followed by information / training seminars on the bureaucratic and legal aspects of the cooperative's establishment which will have the name of the Kebelé, Wezeka.

Other training courses will cover:

- Governance
- Administrative and financial management
- Marketing associations

- Consolidation of assets
- Business growth and projection

The cooperative will be a place of work and of professional and human growth for both men and women but will retain spaces and activities reserved for women only. The structure will include a Centre for Women that will hold:

- workshops
- training courses
- socialization meetings
- educational seminars specific to the value of nutrition and its effects on the human and intellectual development of children, adolescents and adults.
- Information on health prevention.

Seminars will focus on the importance of multimedia information and on the advertising message regarding the Moringa's nutritional value. This information will also be developed in schools that will in turn visit the cooperative on its production, product transformation and marketing preparation sites.

The visits will give the opportunity to stimulate in the children's curiosity and interest in the work being done in and by the cooperative.

Educational tools will be designed to broaden and connect the knowledge of young students; for example, by following the travel routes of the colourful packages of *Moringa stenopetala* throughout the world.

If women want to carry out complementary activities, in regard to the production and marketing of the Moringa's products, the project will provide the necessary tools and technical assistance. As already mentioned (in the Organic Production System of *Moringa stenopetala* chapter), cooperative's nursery will be handled by women members.

To favour the serenity and motivation of the women within the Wezeka Cooperative, the project envisions reserving a safe space for pre-school children.

15. MORINGA DEVELOPMENT OPPORTUNITIES AND CHALLENGES

15.1. Opportunities

Moringa stenopetala is a tree endemic to the southern part of Ethiopia and over than 5 million people are using it as staple food and medicinal plant, based on tradition.

The potential of Moringa as multipurpose tree allows expanding its use significantly as it is:

- Drought resistant, fast growing tree that grows in marginal area
- Source of food supplement, feed, fodder, edible oil, biofuel an industrial raw material
- Prospective crop to ensure food security and environmental management in arid and semi-arid pastoral or agro-pastoral areas
- Endemic plant that offers international market opportunities and recognition for the

community

- Water purifying agent that helps rural people to clean water
- Potential plant to mitigate the issue of climate change-carbon sequestration, carbon trade that contributes to green developments

15.2. Challenges

- Very few research activities on its accessions, high genetic variability
- Non-existent of quality standard and regulatory framework for *Moringa stenopetala* products
- Lack of capacity with respect to safety, GAP, GMP and regulatory framework
- Use of inappropriate technical information for production processing and marketing
- Promoting *Moringa* as medicine without sufficient information and verification
- Disorganized information disseminating insufficient knowledge on the values of *Moringa*.

16. CONCLUSION AND RECOMMENDATIONS

Women and men from the Southern Region have always known the beneficial contribution of Moringa to family nutrition; the plant is prolific at the end of the dry season, when few other vegetal foods are available. Women know that it is healthy and use it as part of their tradition, as well as an addition to the daily meals.

The project allows to link the development of a plant of exceptional nutritional value to the needs of a population in which serious and widespread cases of malnutrition have been detected.

Actively involved in the household needs, women control consumption patterns, provide health, can use a wide diversity of species for food and medicine that are traded in market.

Women deserve to wider their knowledge, not only to better understand how and why the miracle tree” is beneficial for health and physical and intellectual development.

They also deserve to thrust in their capacity and skill, to grow in their self-esteem, to be supported in the capacity to take decision, speaking in public, to be engaged to be more visible in agricultural production and commercialization, an area where they have traditionally been undercounted.

Improving the status of women and empowering them in agricultural production and value chain activities, has multi-dimensional benefits, which include improved food and nutritional control in their families and also improve nutritional income

17. REFERENCES

- Metabolically Efficient Information Processing (Balasubramanian, 1998)
- Sustainable Development Best Practices competition at Expo Milano 2015 (Janaki, S. and Jamina Devi, Department of Food and Nutrition Madre Teresa Women’s University, India, 1998)
- Lolos S.; Goitzi O, Tsaknist J. 2006
- 1995 cited in Leavy and Poulton, 2007
- Strasberg et al., 1999
- Govereh et al., 1999
- Von Braun et al., 1994
- Bernard and Spielman, 2008
- Bernard et al., 2007
- Samuel and Sharp, 2007
- Abuye et al., 2007
- Yisehak et al., 2010
- K. Yisehak, M. Solomon and M. Tadelle, 2011
- Yisehak et al., 2010
- K. Yisehak, M. Solomon and M. Tadelle, 2011
- Kebele et al., 2007
- Erhabor and Emokaro 2007, Ibrahim et al., 2009
- Ghosh, 2011
- Dr. Sreepada Hedge, Dr. Vijayalaxmi Hedge, 2013
- Journal of Marketing and Consumer Research - ISSN 2422-8451ol.28, 2016
- Mulugeta Girma and Mingizem Birhan, 2004

- Delforces et al., 2005
- Paule Monstrien et al., 2010 – Elsevier volume 35
- Poulton, Dorword and Kyald, 2010
- Darward, Kyed , 2014
- IFPRI (International Food Policy Research Institute), March 2015
- EDRI (Ethiopian Development Research Institute), March 2015
- Pelto, 1990
- Im-Act, 2005
- CIDA, 1997

Attachments

Cooperative Requirements for lease financing

Requirements for lease financing:

1. Application

Bank and finance lease services to applicants who want to lease their capital base and useful excursion vessel type, quoting the Office should provide OOps.

2. Permission

2.1. Business License

2.2. Registration of immovable property

2.3. Tax Identification Number

3. Land / Production Place:

- Production site must have proof of availability of electricity (electricity and water).
- The place should also be suitable for production.

3.1. If Ownership

- Proof of copyrights attached to the relevant government body

3.2. If You Are Getting a Government Form a Government

- production period shall be consistent with the lease period and must be registered by the concerned organization.
- landlord must allow the landlord to agree to allow the landlord to install the machinery in the premises. This should be included in the lease agreement.
- the premises must be transferred to a third party because the tenant is not liable to the obligation
- This should be included in the lease agreement.

3.3 The individual is from a rental unit:

- The lease must be registered in the relevant body,
- Production place: The period of rental must be at least one year, and be renewed annually at the end of the term of the rent.
- project forces the production plant to be permanently installed, the production period of the production site must be at least in accordance with the minimum period of lease period.
- landlord must agree to allow the tenant to install the plant in its place This should be included in the lease agreement.
- landlord decides to terminate the lease, the landlord must notify the tenant in writing at least three months in writing. This should be included in the lease agreement.
- the tenant will be covered by the cost of processing a place of production.

4. Price Receipt / Pro-forma invoice /

The applicant must provide the invoice receipt separately and from the third-party producer or legal representative.

The invoice receipt must include the following:

- name and address of the seller
- name and address of the buyer
- sales status
- payment status
- country of origin
- date of the delivery of the item
- detailed technical specifications

5.Representation

Request for lease financial assistance by a third party must be submitted by authorized agents and authorized representatives.

6.pre-record history record

The applicant has previously organization is essential that the information from this should provide:

Breadcrumbs	Applicant name	Company address	Organization / position of the company

6.1. Financial Statement

It should provide a compliant financial statement no longer than three years or audited financial statements appear at authorized auditors.

6.2. The applicant / owner /loan history

Loan information must be submitted from the Bank or Microfinance Institution, which includes: name of the borrower's financial institution

- Date of invoice
- how many times have you lost
- Time to complete the loan
- loan repayment status
- the debt situation of the borrower.

7. A Letter of Proof from the Persons Receiving Tax Credit.

8. Environmental Impact Assessment Verification Letter from the pertinent bodies of the project.

9. Social interaction of the applicant

The applicant must have a clear vision of a well-known and well-off society in the community.

10. Administration

The applicant must submit proof of the project manager's or CV project with reference documents, including the following information, including:

- address
- history
- work experience

11. Type of the organization / individual contribution source (Source of equity), the applicant must show clearly the source of funds for use assessed contributions.

12. Engagement certificate

The small and medium-sized enterprises (SMEs) who have been organized and assisted by the government have to provide the following evidence as required.

12.1. Letter of Support for the financial support of the Bank.

12.2. Evidence of the necessary training (entrepreneurial, marketing, account management, technique, etc.) necessary for the job.

13. Business Plan or Feasibility Study /Detailed Details Regarding the Form / Information needed to expand existing projects

- 1.Article I of No. 13 out of the ordinary number 1-12 listed all conditions
- 2.Renewed business license
- 3.Expansion license (if needed)
4. Additional capital: The capital recorded is not sufficient
5. A Review of the Account shall be at least three years
6. A letter of verification from the body concerned that it is properly managing the environmental security obligation
7. Detailed plan for the expansion project
8. A proof of tax fulfilment
- 9.Prospective experience of the old labourers and the details of the details
10. Soft goods list, including price and day of purchase
- 11.List of existing assets; including the price and date of purchase
- 12.At least one-year performance review report

Breadcrumbs	Product type	Year 1		Year 2		Year 3	
		Count	Price	Count	Price	Count	Price
1	Product 1						
2	Product 2						
3	Product 3						
4	Sale						
	4.1 Country						
	4.2 Export						

13. All evidence must be provided and a signed statement stating the true financial condition of the project.

Content of Feasibility Study of Small and Medium-Sized Enterprises for more than 10 Million Birr Capital Investment

The project's feasibility study should be prepared by the consultants authorized by the Facility, and the content of the study should include at least the following:

1. Executive Summary: Explains the key points outlined below and confirms the amount of the required amount.

2. Project Background

2.1. Description of applicant and project: name, address, marital status, type of project / economic activity, legal organization, etc.

2.2. Short story of the project / applicant

2.3. Objective of the project

2.4. Past activity of the project (prospective)

2.5. The status of the applicant's credit history

2.6. The purpose and size of the requested lease financial assistance

3. Market Research (Market Analysis)

Analyse information on the market that is being procured by the company for sale at the time.

3.1. General analysis of the market for the organization

3.2. Contest: -Ensure consistency by providing multiple production companies with more productive and better products

3.3. Demand Analysis: Demand Analysis Consumers should be responsible for customer service, such as what customers want, how product is accepted, and how well the consumer's ability to buy and buy.

3.4. The supply analysis (Supply Analysis)-

Demonstrating the project's local and external supply capabilities in the target market

3.5. The supply-driven gap analysis: Presenting an analysis of the supply/ service gap of the company on time.

3.6. Others

availability of alternative inputs for the product / service,
lack of environmental safety and health / restricted living standards,
occupancy of trained manpower and payment level,
the proximity to major markets
availability of affordable (infrastructure) products to market.

3.7. Price Analysis: The price of the product at market value is estimated at least five years prior to the date of the project and based on the income and cost of the project, how the company assesses the value of the product and how it is competitive in this market.

3.8. Marketing Strategy: Describe the strategies and strategies used by the company to sell the product.

3.9. SWOT Analysis: Analysing the strengths and weaknesses of the organization and analysing the conditions and conditions of the organization that are relevant to the local / external situation.

4. Technical Study

4.1 Project Status of the Project: Describe the geographical location of the project, indicating that the production site is sourced from raw material, processing and marketing.

4.2 Project Engineering- In this section the following engineering projects are addressed

4.2.1 Construction and civil works: -Manufacture of raw material, raw material and finished product storage warehouse, including workshops that demonstrate the production style of the production facility suitable for production.

4.2.2 Miscellaneous Equipment: List of spare parts and utensils, detailed list of machines and spare parts, detailed accessories, machine development program, product requirements, availability, etc.

4.3 Utility and Infrastructure Development The availability of facilities such as water, electricity, roads, and other facilities to operate the project efficiently and reliably.

4.4 Production process: List of processes, processes, planned production, expense segment, storage management plan, and expected amount of production process.

4.5 Environmental Impact Assessment: The project should address local and non-direct, positive and negative impacts of the project and strategies used to address the negative impacts of the project.

5. Organization, Administration and Human Resources.

5.1. Structure of the organisation: the focus of the company's management, its role and division, cooperation and control, organizational purpose.

5.2 The organization's leadership skills, experience and skill assessment- the organization in the hands of individual experience, production capacity and fitness.

5.3 Human Resource-Based Institutional capacity and skills training, recruitment training, work wages, incentives and benefits.

6. Financial analysis - The project's estimated cost of finance, financial system and revenue from the project.

6.1. Planned Investment: The General Project covers the financial need, capitalization and financing required for capital goods and operations, and the obligation of the borrower to contribute.

6.2. Total sales forecast: The firm predicts how much revenue it will need to spend on its time schedule.

6.3. Operating expenses (Operating Cost)-project product / service to identify and implement direct and indirect costs

6.4. Predicted a financial statement (Projected Financial Statement): -Statement of Income and Expense (Income statement): - Profit and loss forecast, cash flow forecasting, description of assets and liabilities includes.

6.5. Project Effectiveness and Other Adaptive Measurements.

6.5.1. Return on investment - Returns percentage of return on investment in the project's economic life.

6.5.2. Net Present Value: the current cash flow of the project refers to the current price point.

6.5.3. Brea-Even Point: the project is used to calculate the minimum selling rate of the project, not at a specific sale price or profit.

6.5.4. Debt Relief Period: the project indicates the amount of time required to repay the original cost of the project.

7. Socioeconomic features: the importance of the project by demonstrating the contribution the organization has made to the community in terms of how much employment has been created or created, the annual income tax payable to the public, the relationship with the community, the foreign currency exchange or the export of foreign products.

8. Conclusion and Recommendation: briefly discuss the topics covered in the discussion and summarize the issues that will be helpful to the project.

Small and medium-sized enterprise business plans requiring investment capital of Birr 10 million or less.

Organizational Handbook
and Job Manual

ORGANIZATIONAL HANDBOOK

Cooperative for the production and processing of the products derived from Moringa Stenopetala

I

NAME OF UNIT: General Assembly of Associates	HIERARCHICAL POSITION: Any	SUBORDINATE POSITIONS: Board of <u>directors</u> , <u>General management</u> , Head of Production, Head of Human Resources, Head of Marketing, Accounting
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CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	

UNIT'S GOAL: To ensure the proper functioning of the cooperative, analyzing the situations and important points in order to make decisions for the direct benefit of the cooperative.

TASKS

- ◆ Administrative, economic and financial management of the cooperative.
- ◆ Coordinating and carrying out work meetings within all organizational units
- ◆ Planning, organizing, directing and controlling the recruitment of new staff
- ◆ Evaluating the other units' compliance with the plans and goals of the company
- ◆ Generating performance reviews to members of the partnership
- ◆ Generating salary forms for company personnel
- ◆ Establishing relationships with suppliers and distributors
- ◆ Analyzing and approving the General Balances, the Income Statement and the financial results
- ◆ Distributing and allocating the different funds of the company
- ◆ Knowing the agenda of the day, for approval or modification
- ◆ Approving the objectives and policies of the company's strategic and work plans
- ◆ Approving the general norms of the administration of the company
- ◆ Authorizing the capitalization or distribution of interests and surpluses in agreement with the partners
- ◆ Agreeing on the creation and use of reserve and special funds
- ◆ Agreeing to add other activities to those established in the Articles of Incorporation
- ◆ Establishing amounts of annual contributions or other fees, created for a specific purpose
- ◆ Establishing the voting system
- ◆ Knowing and approving the Statutes' modifications

ORGANIZATIONAL HANDBOOK		
Cooperative for the production and processing of the products derived from <u>Moringa Stenopetala</u>		I
NAME OF UNIT: General management	HIERARCHICAL POSITION: Associates General Assembly	SUBORDINATE POSITIONS: Head of Production, Head of Human Resources, Head of Marketing, Accounting
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	
UNIT'S GOAL: To plan, organize, direct and control the functions to be performed within the company, working with each head of the Headquarters under his command to achieve the goals and objectives set.		
TASKS		
<ul style="list-style-type: none"> ◆ Formulating the policies and strategies necessary for the operation of the company and presenting them to the production department and higher instances of the cooperative ◆ Making timely and effective decisions regarding company affairs. ◆ Establishing policies and standards for the proper functioning of the company ◆ Conducting assessments of the achievements of company objectives. ◆ Regularly informing the higher instances of the Cooperative about the company's labor development. ◆ Planning the budget for the good functioning of the company and presenting it to the production department and higher instances of the cooperative ◆ Evaluating and controlling the general functioning of the various headquarters of the company. ◆ Approving training for employees of the company. ◆ Encouraging the spirit of teamwork in each of the units under its command. 		

ORGANIZATIONAL HANDBOOK

Cooperative for the production and processing of the products derived from Moringa Stenopetala

NAME OF UNIT: Board of Directors	HIERARCHICAL POSITION: General Assembly of Associates	SUBORDINATE POSITIONS: General management
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CREATED FOR:	DATE OF CREATION:	
REVIEWED BY:	REVIEW DATE:	PAGE:

UNIT'S GOAL: To supervise all of the Cooperative society's activities.

- ◆ Complying with and enforce the Law, Regulations, Bylaws and General Assembly Agreements.
- ◆ Creating committees, appoint their members as well as the Manager or Managers of the Cooperative.
- ◆ Deciding on admission, suspension, disqualification and withdrawal of associates
- ◆ Keeping a book of Associates Registration duly authorized by ... that will contain the full names of the associates, their nationality, address, age, marital status, profession, date of admission, their withdrawal and other information set forth in its bylaws.
- ◆ Establishing internal operating standards.
- ◆ Agreeing on the constitution of liens regarding the goods and the estate owned by the Cooperative.
- ◆ Advising the General Assembly of Associates on the transfer of the cooperative's estate.
- ◆ Making sure the accounting books and files are in full view of all the associates, as determined by the statutes.
- ◆ Receiving and delivering the goods and various estates of the Cooperative, according to inventory.
- ◆ Expressing caution if necessary to employees who care for or manage the assets of the Association.
- ◆ Designating the financial or banking institutions in which the funds of the association will be deposited, and the persons who administer them, in the form established by the respective statutes.
- ◆ Submitting to the Ordinary General Assembly the work reports and the financial statements issued during the corresponding fiscal year.
- ◆ Preparing the work plans and submitting them for the consideration of the General Assembly of Associates.
- ◆ Elaborate and execute programs of social projection that benefit the membership of

ORGANIZATIONAL HANDBOOK

Cooperative for the production and processing of the products derived from Moringa Stenopetala

NAME OF UNIT: Audit committee	HIERARCHICAL POSITION: General Assembly of Associates	SUBORDINATE POSITIONS: General management
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CREATED FOR:	DATE OF CREATION:	
REVIEWED BY:	REVIEW DATE:	PAGE:

UNIT'S GOAL: To supervise the good functioning of the cooperative in general, ensuring that the cooperative objectives are being fulfilled according to the interests of the partners and ad established by the law.

TASKS

- ◆ Ensuring that members of the Board of Directors, employees and members of the association fulfill their responsibilities.
- ◆ Supervising the society's operations, making sure they are carried out as efficiently as possible.
- ◆ Carrying out audits of the accounts to verify that the balance sheets are executed on time and are made known to the associates.
- ◆ Monitoring the use of funds.
- ◆ Reporting to the General Assembly on situations that were irregular or that were not part of the association's statutes.
- ◆ Contributing an opinion regarding the reports and financial statements of the cooperative society.

ORGANIZATIONAL HANDBOOK

Cooperative for the production and processing of the products derived from Moringa Stenopetala

NAME OF UNIT: Head of Production	HIERARCHICAL POSITION: General Management	SUBORDINATE POSITIONS:
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	

UNIT'S GOAL: To coordinate all those activities that allow smooth and efficient operations in the production areas of the company, maximizing its qualitative possibilities and the fulfillment of its goals.

TASKS

- ◆ Establishing labor standards and policies for the production area, as well as planning and controlling this sector.
- ◆ Applying the established quality standards as required by market laws.
- ◆ Meeting the goals and objectives of the annual production plantation.
- ◆ Implementing production methods aimed at the optimization of resources.
- ◆ Participating in regular meetings with the General Management.
- ◆ Preparing necessary reports detailing obtained results with clear information.
- ◆ Coordinating and directing raw material stock and quality, and maintaining constant contact with the Head of Marketing regarding their supply.
- ◆ Supervise the proper functioning, use of equipment and machinery within the facilities.

ORGANIZATIONAL HANDBOOK

Cooperative for the production and processing of the products derived from Moringa Stenopetala

NAME OF UNIT: Accounting	HIERARCHICAL POSITION: General Management	SUBORDINATE POSITIONS:
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	

UNIT'S GOAL: To supervise and analyze the cash flows of the company, in order to provide information that will serves as a base for the organization's decision making

TASKS

- ◆ Preparing the monthly and yearly financial statements
- ◆ Calculate customer service charges
- ◆ Recording all income and expenses of the organization in the daily, auxiliary and primary books
- ◆ Supervising the shop assistants
- ◆ Providing financial-accounting information to management when requested
- ◆ Elaborating statistics regarding the finances
- ◆ Preparing the corresponding tax return
- ◆ Participating in regular meetings with the General Management
- ◆ Conducting internal accounting audits.

ORGANIZATIONAL HANDBOOK

Cooperative for the production and processing of the products derived from Moringa Stenopetala

NAME OF UNIT: Head of Merchandising	HIERARCHICAL POSITION: General Management	SUBORDINATE POSITIONS:
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	

UNIT'S GOAL: Implementing and establishing the appropriate strategies to achieve the approval, growth and development of the company's products on the market, while simultaneously catering to customer satisfaction.

TASKS

- ◆ Elaborating and supervising plans of commercialization of the company's products
- ◆ Designing strategies to incorporate the company products on the market
- ◆ Designing credit policies
- ◆ Designing the different distribution channels of the products
- ◆ Selling finished products to customers
- ◆ Charging for customer-designed credit sales
- ◆ Preparing reports for the General Management on recorded sales
- ◆ Participating in regular meetings with the General Management
- ◆ Establishing purchasing policies for the various supplies, administrative equipment, raw materials, etc. for the company
- ◆ Evaluating, selecting and maintaining records of suppliers
- ◆ Supervising the follow up of the purchase plan

JOB MANUAL

Cooperative for the production and processing of the nutritional produce derived from Moringa Stenopetala

POSITION:
Cooperative President

HIERARCHICAL POSITION:
General Assembly

SUBORDINATE POSITIONS:
All areas

CREATED FOR:

DATE OF CREATION:

REVIEWED BY:

REVIEW DATE:

PAGE:

POSITION'S GOAL: To coordinate all activities related to the functioning of the company.

TASKS

- ◆ Plan and organize investment projects
- ◆ Plan the sources and uses of financial resources
- ◆ Analyze and evaluate, together with the General Manager, the financial results of the business
- ◆ Review and evaluate the management reports prepared by each function and take the relevant decisions
- ◆ Plan and oversee customer and distributor service improvement strategies
- ◆ Evaluate the performance of company functions through testing and analysis.
- ◆ Evaluate the achieved goals at the end of the year to decide a course of action.
- ◆ Submit reports of results to the General Assembly.

POSITION REQUIREMENTS

Level of studies: Industrial Engineering or Business Administration

Experience: 5 years in similar positions

Other: Responsible, able to make decisions, personal management skills, dynamic, used to working under pressure.

JOB MANUAL		
Cooperative for the production and processing of the nutritional produce derived from <u>Moringa Stenopetala</u>		
POSITION: General Manager	HIERARCHICAL POSITION: Board of directors	SUBORDINATE POSITIONS: Production manager, Head of human resources, Head of Marketing, Accountant
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	
POSITION'S GOAL: To plan, organize, manage and control the duties to be performed within the company, working with each headquarter manager under his command to achieve the goals and objectives set.		
TASKS		
<ul style="list-style-type: none"> ◆ Anticipate the execution of duties for the company's good functioning. ◆ Design, jointly with the other headquarters and the necessary personnel, the company strategies. ◆ Evaluate and make timely decisions on business issues. ◆ Organize regular meetings to evaluate the performance of the company. ◆ Approve the financial statements. ◆ Conduct performance appraisals of the company along with the accountant and the Cooperative's general accounting. ◆ Supervise the hygienic and organizational process of the company. ◆ Supervise and authorize the payroll. ◆ Generate a stable organizational climate within the organization. 		
POSITION REQUIREMENTS		
Level of studies:	Industrial Engineering or Business Administration	
Experience:	5 years in similar positions	
Other:	Responsible, able to make decisions, personal management skills, dynamic, used to working under pressure.	

JOB MANUAL		
Cooperative for the production and processing of the nutritional produce derived from <u>Moringa Stenopetala</u>		
POSITION: Production Manager	HIERARCHICAL POSITION: General Management	SUBORDINATE POSITIONS: Quality supervisor, Maintenance Manager, Chief of warehouse, Workers
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	
POSITION'S GOAL: Coordinate all those activities that allow a functional and reliable performance in the production areas of the company, being able to count on the highest possible quality and the fulfillment of established goals.		
TASKS		
<ul style="list-style-type: none"> ◆ Coordinate, lead and control the production process ◆ Develop production plans and schedules ◆ Ensure compliance with production plans ◆ Establish product processing standards and policies for an efficient and secure process. ◆ Review and control the finished product ◆ Authorize distribution plans for finished products ◆ Establish hygiene standards to provide a product of optimum quality. ◆ Supervision of personnel. ◆ Keep records of consumption of raw materials and production inputs. ◆ Organize the reorder of the raw materials necessary for the production ◆ Develop contingency plans to predict unplanned events. ◆ Participate in regular meetings with the General Director 		
POSITION REQUIREMENTS		
Level of studies:	Industrial Engineering or Chemical Engineering	
Experience:	2 years in similar positions	
Other:	Responsible, ability to make decisions	

JOB MANUAL		
Cooperative for the production and processing of the nutritional produce derived from <u>Moringa Stenopetala</u>		
POSITION: Quality Supervisor	HIERARCHICAL POSITION: Production Manager	SUBORDINATE POSITIONS: Maintenance Manager, Chief of warehouse
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	
POSITION'S GOAL: Quality control of the raw material and finished product and supervise the state of installations, equipment and utensils, and the fulfillment of programs established to guarantee the minimum requirements according to standards implemented.		
TASKS		
<ul style="list-style-type: none"> ◆ Monitor the verification of the quality of raw materials that enters the plant ◆ Verify the quality of the water used in the production process, and that the personnel meets the requirements of entry to the production area and that they carry the appropriate equipment ◆ Certify that the facilities in general comply daily with the operational requirements for the product's safety ◆ Check that the equipment complies daily with the physicochemical requirements ◆ Perform the quality inspection at the beginning of the packaging process ◆ Verify that chemicals used are permitted in the food industry. ◆ Verify compliance with the maintenance program, cleaning and zoning of facilities, employee health control, pest control and waste management program, and monitor the product quality ◆ Verify the condition of the packaging area, raw material and finished product ◆ Make the necessary reports on the verifications performed. 		
POSITION REQUIREMENTS		
Level of studies:	Chemical Engineering	
Experience:	1 year in similar positions	
Other:	Responsible, honest and committed to results	

JOB MANUAL		
Cooperative for the production and processing of the nutritional produce derived from <u>Moringa Stenopetala</u>		
POSITION: Chief of Warehouse	HIERARCHICAL POSITION: Production Manager	SUBORDINATE POSITIONS:
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	
POSITION'S GOAL: Control the warehouse's ins and outs of raw materials and finished products to guarantee adequate product care and monitor existing stocks.		
TASKS		
<ul style="list-style-type: none"> ◆ Coordinate with the purchasing and logistics manager the supply of raw materials and the delivery of finished products. ◆ Maintain control of finished product and raw materials. ◆ Direct and control the distribution of finished product in assigned areas. ◆ Manage the equipment handling and movements. ◆ Review warehouse levels. 		
POSITION REQUIREMENTS		
Level of studies:	Graduate	
Experience:	One year in similar positions	
Other:	Responsible, dynamic, accustomed to working under pressure	

JOB MANUAL		
Cooperative for the production and processing of the nutritional produce derived from <u>Moringa Stenopetala</u>		
POSITION: Maintenance Manager	HIERARCHICAL POSITION: Production Manager	SUBORDINATE POSITIONS:
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	
POSITION'S GOAL: Perform preventive and corrective maintenance necessary for the proper functioning of machinery and equipment.		
TASKS		
<ul style="list-style-type: none"> ◆ Keep record of the equipment and machinery specifications ◆ Report weekly to detail the work necessary for the proper functioning of machinery and equipment ◆ Report weekly to detail needed spare parts or other needs to achieve proper maintenance according to the work task ◆ Carry out the preventive maintenance needed for each item of machinery and equipment ◆ Perform necessary corrective maintenance for each item of machinery and equipment ◆ Train operating personnel in the handling and maintenance of machinery and equipment 		
POSITION REQUIREMENTS		
Level of studies:	Electromechanical Technician	
Experience:	One year in similar positions	
Other:	Responsible, dynamic, accustomed to working under pressure	

JOB MANUAL

Cooperative for the production and processing of the nutritional produce derived from Moringa Stenopetala

POSITION:

Operative

HIERARCHICAL POSITION:

Production Manager

SUBORDINATE POSITIONS:

CREATED FOR:

DATE OF CREATION:

REVIEWED BY:

REVIEW DATE:

PAGE:

POSITION'S GOAL: Execute all activities related to the production department.

TASKS

- ◆ Production process operations (reception, inspection, preparation, washing, crushing, drying, grinding, packaging, labeling, pasteurizing).
- ◆ Handling of equipment inside the plant.
- ◆ In charge of cleaning the plant.
- ◆ Knowledge of each workstation's tools.
- ◆ Compliance with the production order.
- ◆ Management of the teams transporting raw materials, equipment and finished products.
- ◆ Ensure product quality control for each operation.
- ◆ Assist the production manager in regard to the operation of the plant.

POSITION REQUIREMENTS

Level of studies:

Ninth grade

Experience:

One year in similar positions

Other:

Responsible, dynamic, accustomed to working under pressure

JOB MANUAL		
Cooperative for the production and processing of the nutritional produce derived from <u>Moringa Stenopetala</u>		
POSITION: Head of Human Resources	HIERARCHICAL POSITION: General Manager	SUBORDINATE POSITIONS:
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	
POSITION'S GOAL: To plan, organize, direct and control the functions to be performed within the company, working with each manager under his command to achieve the envisioned goals and objectives.		
TASKS		
<ul style="list-style-type: none"> ◆ Plan the execution of the company's activities for its proper functioning. ◆ Design, together with the other managers and the necessary personnel, the strategic plans of the company. ◆ Evaluate and make timely decisions on business issues. ◆ Organize meetings to evaluate the regular functioning of the company. ◆ Approve the financial statements. ◆ Evaluate the behavior of the company's profitability, along with the accountant and cooperative's general accounting. ◆ Supervise the company's hygiene and order. ◆ Supervise and authorize the payroll ◆ Comply with the goals and objectives set ◆ Generate a stable organizational climate within the organization 		
POSITION REQUIREMENTS		
Level of studies:	Industrial Engineering or Business Administration	
Experience:	5 years in similar positions	
Other:	Responsible, ability to make decisions, skills of personnel management, dynamic, accustomed to working under pressure	

JOB MANUAL		
Cooperative for the production and processing of the nutritional produce derived from <u>Moringa Stenopetala</u>		
POSITION: Head of Sales and Logistics	HIERARCHICAL POSITION: General Manager	SUBORDINATE POSITIONS: Invoicing Receptionist
CREATED FOR:	DATE OF CREATION:	
REVIEWED BY:	REVIEW DATE:	PAGE:
POSITION'S GOAL: Supervise the sales logistics, purchasing and inventory management to keep each of these areas under control.		
TASKS		
<ul style="list-style-type: none"> ◆ Serve customers in a kind and pleasing manner. ◆ Sell to both end consumers and wholesalers ◆ Maintain constant communication with end consumers and wholesalers ◆ Prepare periodic sales reports. ◆ Constantly seek to enlarge the client portfolio. ◆ Determine the various requirements of the customers such as quality expectations of the products. ◆ Determine potential demands for new products. ◆ Keep records and establish a database of the company's customers. ◆ Investigate market prices regarding raw materials and supplies. ◆ Investigate suppliers who offer better conditions of purchase and keep them on record. ◆ Elaborate quotations reports. ◆ Carry out purchasing procedures once they have been authorized by the Head of Sales and Logistics. ◆ Supervise the product deliveries according to client requests. ◆ Develop product distribution orders. ◆ Presentation of daily and weekly reports on quantity of products delivered. ◆ Supervise that everything complies with the finished product distribution system 		
POSITION REQUIREMENTS		
Level of studies:	Industrial Engineering or <u>Licence</u> in Marketing	
Experience:	Three years in similar positions	
Other:	Responsible, dynamic, accustomed to working under pressure	

JOB MANUAL

Cooperative for the production and processing of the nutritional produce derived from Moringa Stenopetala

POSITION: Invoicing Receptionist	HIERARCHICAL POSITION: Sales Supervisor	SUBORDINATE POSITIONS:
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	

POSITION'S GOAL: To realize the sales invoicing, and to assist its immediate supervisor in speeding up sales functions.

TASKS

- ◆ Assist the General Manager and the Sales and Logistics Supervisor
- ◆ Receive customers making purchases
- ◆ Invoicing of product purchases
- ◆ Overseeing the till
- ◆ Sales revenue control
- ◆ Receiving calls and documentation
- ◆ Report daily sales

POSITION REQUIREMENTS

Level of studies:	Vocational Bachelor Technical with option in secretarial or accountant
Experience:	1 year in similar positions
Other:	Responsible, dynamic, accustomed to working under pressure

JOB MANUAL

Cooperative for the production and processing of the nutritional produce derived from Moringa Stenopetala

POSITION:

Accountant

HIERARCHICAL POSITION:

General Manager

SUBORDINATE POSITIONS:

Invoice Receptionist

CREATED FOR:

DATE OF CREATION:

REVIEWED BY:

REVIEW DATE:

PAGE:

POSITION'S GOAL: Perform accounting procedures within the company to meet both internal and external requirements

TASKS

- ◆ Record the outflows and inflows of cash and other assets of the company.
- ◆ Prepare in a timely manner the reports requested by General Management
- ◆ Carry out the economic, tax and legal reports required by law
- ◆ Prepare balance sheet and profit and loss statements
- ◆ Keep an accounting book
- ◆ Set up accounting accounts
- ◆ Advise on new investments
- ◆ Prepare payroll for employees
- ◆ Verify checks from suppliers and distributors
- ◆ Carry out tax declarations
- ◆ Archive all the accounting procedures of the company
- ◆ Establish product costs, product prices, and profit margins
- ◆ Report on the financial indicators of the company

POSITION REQUIREMENTS

Level of studies:

Degree in Public Accountancy

Experience:

Three years in similar positions

Other:

Responsible, dynamic, accustomed to working under pressure

JOB MANUAL		
Cooperative for the production and processing of the nutritional produce derived from <u>Moringa Stenopetala</u>		
POSITION: Agriculture production manager	HIERARCHICAL POSITION: General Manager	SUBORDINATE POSITIONS: Maintenance Manager, Chief of warehouse
CREATED FOR:	DATE OF CREATION:	PAGE:
REVIEWED BY:	REVIEW DATE:	
POSITION'S GOAL: Planning all the agriculture activities of the cooperative and collaborate with the production manager and Research Institution.		
TASKS		
<ul style="list-style-type: none"> ◆ Design the nursery, clonal gardens and plantation of <u>Moringa</u> seeds and leaves production ◆ Supervising all the agronomic activities: plantation, pest control, weeding, pruning, harvesting ◆ Monitoring and supervising all the organic production activities ◆ Collaboration with the Productive manager and General manager ◆ Collaboration with scientific institution for the implementation of a comprehensive research process to better know <u>Moringa stenopetala</u> genetic profile and hits accessions ◆ Make the necessary reports of activities, problems and solutions. 		
POSITION REQUIREMENTS		
Level of studies:	Agronomist	
Experience:	2 year in similar positions	
Other:	Responsible, honest and committed to results	

Women and Nutrition

<https://www.ifpri.org/weai-training-materials>



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Women's Empowerment in Agriculture and Nutritional Outcomes in Ethiopia

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IFPRI ESSP

Agricultural Economics Society of Ethiopia
15th Annual Conference
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Addis Ababa

Background

- Agriculture is closely linked to food security in rural parts of Ethiopia.
- Change in agricultural productivity - both direct and indirect implications on nutritional outcomes.
- Various ways through which increase in agricultural productivity can translate to change in nutritional outcomes.
 - increased food for own consumption,
 - increase in income,
 - reduction in market prices,
 - changes in preferences and
 - shifts in the control of resources within households.
- In all these five pathways, gender roles have a significant influence.

Background – cont'd

- Intra-household resource allocation has a considerable role to play in nutritional outcomes.
- The extent to which women have access to and control over resources largely determines the kind of care they provide for their children.
- Women's lack of control over household resources, time, knowledge, and social support networks constitute a major barrier to improving poor nutritional outcomes in Ethiopia
- Empirical researches have also shown that women's greater control in household has an impact on the nutritional and educational outcomes of children



Background – cont'd

- The linkages are complex, and the direction of relationship between women's status and nutrition are not always straight forward.
- For instance, women's empowerment through engaging in agriculture or other paid work
 - could reduce the amount of time available for them to take care of themselves as well as their children.
 - Positive income effect
- Measuring women's empowerment is not straight forward.
- Quantifying the linkages between women's empowerment and nutritional outcomes depends on the measurement of empowerment.



Objective

- This research aims at looking into the relationship between women's empowerment and nutritional outcomes of both women and children in the rural Ethiopia context
- Using a recently developed measure of women empowerment called Women Empowerment in Agriculture Index (WEAI).
- Outcome variables
 - Children's nutritional outcomes (stunting, wasting, underweight)
 - Women's nutritional outcomes (Women's Dietary Diversity)

Data

- Data from a baseline survey conducted for the evaluation of the FtF program in Ethiopia, the US government global hunger and food security initiative.
- Collected from 5 regions of the country and comprises of 7,056 households from 84 woredas (districts).
- Data collection took place in June 2013.
- The questionnaire used for the survey includes modules on
 - basic demographic information; household consumption expenditure; Women empowerment indicators; women dietary diversity and anthropometry; child anthropometry and infant and young child feeding; employment, agricultural productivity and input use; and other relevant information.

Methodology – Women’s Empowerment in Agricultural Index (WEAI)

- The Women Empowerment in Agriculture Index (WEAI) is used to measure women’s empowerment.
- The index was developed by researchers at USAID, IFPRI, and the Oxford Poverty and Human Development Initiative (OPHI)
- To track the change in women’s empowerment levels that occurs as a direct or indirect result of interventions under Feed the Future, the U.S. government’s global hunger and food security initiative.
- Measures the empowerment, agency and inclusion of women in the agricultural sector.



Methodology – Women’s Empowerment in Agricultural Index (WEAI)

- Composed of two sub-indexes: the Five Domains of Empowerment sub-index (SDE) and the Gender Parity sub-Index (GPI)
- Five Domains of Empowerment (SDE) measures the empowerment of women in five areas (90 percent of the total WEAI); and
- The Gender Parity Index (GPI) measures the average level of equality in empowerment of men and women within the household (10 percent of the total WEAI).



Methodology – WEAI Components

- The five domains, their definitions under the WEAI, the corresponding indicators, and their weights for the 5DE are:

Domain (each weighted 1/5 of 5DE sub-index)	Indicator	Weight
Production	Input in productive decisions	1/10
	Autonomy in production	1/10
Resources	Ownership of assets	1/15
	Purchase, sale, or transfer of assets	1/15
	Access to and decisions about credit	1/15
Income	Control over use of income	1/15
Leadership	Group member	1/10
	Speaking in public	1/10
Time	Worked	1/10
	Leisure	1/10

Methodology – Cont'd

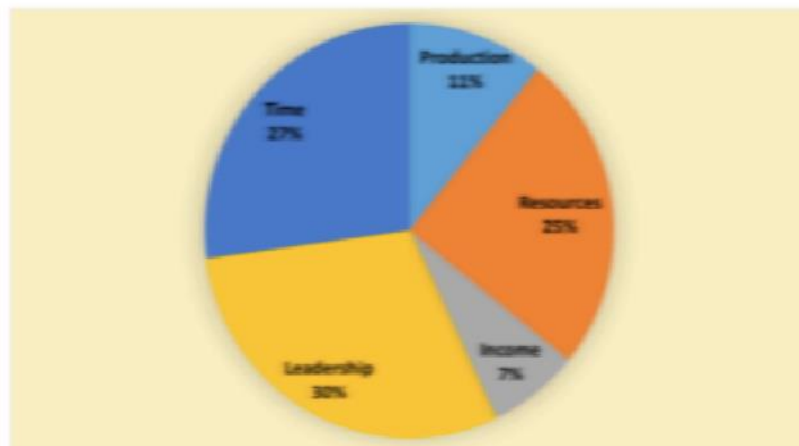
- Following the works by IFPRI colleagues (Siraboni et al, 2014 in Bangladesh and Malapit et al, 2013)
- Multivariate regression method
- Likely that women's empowerment within the household might be affected by the same factors affecting child outcomes and dietary diversity
- Possible endogeneity of the empowerment measure - instrumental variables (IV) technique.
- Percentage of women who are members of women only groups in the community (village level empowerment proxy)
- Number of informal credit sources in the village as instruments for all of the empowerment indicators.
- The cluster-level distance to markets- reflect the intensity of a woman's work burden at home, the woman's degree of isolation within the community

Descriptive Results

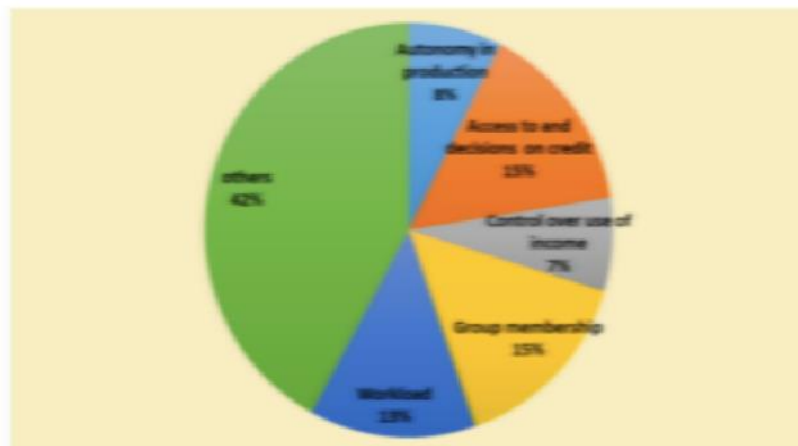
- How empowered are Ethiopian women in Agriculture?
- The female respondents' individual-level SDE profile or score (weighted average of the 10 indicators)
- The average SDE score is 0.64
 - A lower level of empowerment in agriculture for Ethiopian women compared with women in Bangladesh (0.75), Guatemala (0.69) and Uganda(0.79).
- The findings from the WEAI diagnostics are used to identify the focus of analysis.
- Contribution of each of the five domains to disenpowerment
 - Leadership, Time, Resources, Production and Income



Results - Contribution of each of the 5 domains to disenpowerment of women



Results - Contribution of each of the 10 domain indicators to disempowerment of women



Results – Descriptive for outcome variables

Children's Nutritional Outcomes (under 5 years)	
Stunting (%)	51.3
Wasting (%)	12.1
Underweight (%)	33.1
Women's Nutritional Outcomes	
Dietary Diversity (No. of food groups)	1.49



Result: Regression on Women's outcome

	Model1		Model2		Model3		Model4		Model5	
	Five domains of empowerment		Number of group membership		Decision on credit matters		Workload		Decisions on Income issues	
	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS
Dietary Diversity	3.186***	1.260***	0.605**	0.156***	1.892***	0.138***	0.161**	0.024**	0.338***	0.080***

Result: Regression on Children's outcome

	Model1		Model2		Model3		Model4		Model5	
	Five domains of empowerment		Number of group membership		Decision on credit matters		Workload		Decisions on Income issues	
	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS
Age for height z-score	3.127**	0.671**	0.248	0.071	1.257**	0.064	-0.138	-0.013	0.586**	0.045
Age for weight z-score	1.578	0.389*	0.277	0.038	0.244	-0.01	-0.111	0.000	0.101	0.027
Weight for height z-score	-1.661	-0.185	0.063	0.024	-0.88	-0.029	-0.204	0.032***	-0.233	-0.003

Result: Regression on Women's outcome

	Model1		Model2		Model3		Model4		Model5	
	Five domains of empowerment		Number of group membership		Decision on credit matters		Workload		Decisions on Income issues	
	IV	OLS	IV	OLS	IV	OLS	IV	OLS	IV	OLS
Dietary Diversity	3.186***	1.260***	0.605**	0.156***	1.892***	0.138***	0.161**	0.024**	0.338***	0.080***

Regression Results

- Women's empowerment in agriculture has a positive impact on children's nutritional outcome (reducing stunting and underweight) as well as women's nutritional outcomes (Dietary Diversity)
- Different dimensions of women's empowerment appear to have different effects on nutritional status and dietary diversity.
- Decision on credit and control over income is strongly correlated with higher height-for-age and weight-for-age z-scores (lower stunting and underweight)
- The number of hours in paid and unpaid work is also positively associated with children's weight for height z-scores (lower wasting).
- All the dimensions of women's empowerment have a positive impact on women's dietary diversity.



Regression Results

- **Children's nutritional outcomes:**
 - Wealth
 - Availability of dairy cows and chicken
 - Dependency ratio
- **Women's nutritional outcomes (particularly Dietary Diversity)**
 - Education
 - Wealth
 - Availability of dairy cows and chicken
 - Number of crops produced by the household



Recommendation

- Interventions to increase women's agency and capability to make decisions in agriculture may not only provide another opportunity to engage them more visibly in agriculture, an area where they have traditionally been undercounted (FAO 2011), but also work to improve child nutrition as well as their own well-being.
- Improving the status of women and empowering them in agriculture has multi-dimensional benefits which include improved nutritional outcomes.

