SUMMARIES REPORT ON THE POTENTIAL FOR PLANT BASED RANGELAND ENTERPRISES IN THE DRYLANDS OF ETHIOPIA

Improving Pastoral Livelihoods and Natural Resource Management through Plant based Rangeland Products Enterprise

Based in the Borana and Guji Zones

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Study has been conducted for the ELSE Consortium Enhanced Livelihoods in Southern Ethiopia

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Acronyms
APDA Afar Pastoral Development Association
CARE Cooperative for Assistance and Relief Everywhere
CBO Community Based Organisation
CERF Central Emergency Response Fund
DCM Drought Cycle Management
EB Ethiopian Birr
ELMT Enhanced Livelihood in the Mandera Triangle
ELSE Enhanced Livelihoods in Southern Ethiopia
EMC Environmental Management Committee
EFMR Emergency Food Security Reserve
EPDaGoN Ethiopia Pastoral Development and Governance Network
EWD Early Warning Department
EWWG Early Warning Working Group
FAO Food and Agriculture Organisation (UN)
FSCB Food Security Coordination Bureau
GOE Government of Ethiopia
HEA Household Economy Approach
HRF Humanitarian Response Fund
ICRC International Committee of the Red Cross
IFAD International Fund for Agricultural Development
IIFED International Institute for Environment and Development
ILRI International Livestock Research Institute
LEWS Livestock Early Warning System
LIU Livelihoods Integration Unit
LPF Livestock Policy Forum
MDG Millennium Development Goal
MoARD Ministry of Agriculture & Rural Development
NDPPF National Disaster Prevention and Preparedness Fund
OCHA Office for Coordination of Humanitarian Assistance
OPADC Oromia Pastoral Area Development Commission
PARIMA Pastoralist Risk Management Programme
PASDEP Plan for Accelerated and Sustained Development to End Poverty
PCDP Pastoralist Community Development Project (World Bank)
PCI Pastoralist Communication Initiative
PLI Pastoralist Livelihoods Initiative
PSNP Productive Safety Net Programme
PENHA Pastoral and Environmental Network in the Horn of Africa
RED/FS Rural Economic Development and Food Security
RELPA Regional Enhanced Livelihoods In the Mandera Triangle
SC-US Save the Children – United States
SC-UK Save the Children – United Kingdom
SNNPR Southern Nations, Nationalities and People’s Region
SDPRP Sustainable Development and Poverty Reduction Programme
UNICEF UN Fund for Children
WFP World Food Programme
1. Executive Summary

1.1 Existing rangeland products enterprise activity in the ASAL

There is a number of plant based rangeland products enterprises / bio-enterprise already existing in the ASAL that have been established with the central objective of improving rural and pastoral livelihoods and providing tangible incentives for communities to conserve the natural environment. These are diverse in their background as well as their business dynamic, some are particularly well inspired and successful initiatives, others have failed. Most are relatively small scale operations with low levels of investment. In general, the achievements of the well designed and managed community group enterprizes demonstrate the potential for sound social and environmentally supportive commercial initiatives across the ASAL.

It is clearly illustrated by the success or otherwise of the existing bio-enterprises that those established and developed by or with the private sector have sustained and are growing (to varying extents). Those that have been set up and developed purely as NGO community projects, unless there has been involvement of a ‘champion’ or active CBOs, have either not progressed or have dwindled - in some cases collapsed, despite the initial level of investment in training and equipment provided the producer groups. The main contributing factors are often well verbalized by the producer group representatives, i.e. that they have little understanding of the market, no/limited linkages, low level of business ownership, lack of post-market finance i.e for purchasing the raw materials, to invest in equipment, infrastructure etc, in the first few years of operation. These factors provide clear indicators for the approach to bio-enterprise development, particularly in this targeted ASAL region. The need for the following is crucial to success: ownership, commercial partnerships developed at the inception stage onwards, on-going training in all technical and business areas, organisational and financial management, traceability and transparency, product design, market awareness and information, value addition technologies suitable for women, business mechanisms based on group involvement, micro-banking and credit systems.

1.2 Market for natural products

Today, at the international level, the natural products market is both sophisticated and diverse, it a major trend towards natural ingredients and product certification (organic, ethical etc). Consumers are looking for quality, authenticity and a good feel good factor. These market characteristics provide opportunities for African bio-enterprises to harness particular competitive advantages, such as pure and unpolluted source of materials, the lower cost of producing and (in some cases) processing the raw materials into finished products and the emotive storyline (ethical trade - community empowerment - incomes for women and families and the least advantaged, conservation through trade etc). There is consistently strong demand for gum arabic and the aromatic gum and resin extracts from the food ingredients and product fragrance markets. For African honey and other bee products (such as wax, pollen, propolis and royal jelly) the market is increasingly both in size and price return. The bodycare and healthcare markets in Europe, the US, Australasia and Japan are becoming more diverse in character and natural ingredients is the most significant trend. There is considerable interest in sourcing new natural ingredients, particularly those with superior health giving properties than the standard (mostly synthetic and oil based) formulas. This has created cosmetic and bodycare markets for equatorial tree seed oils at prices at or over existing high quality ingredients of their kind (such as almond oil).

In Africa the market for natural products is evolving. The traditional individual/family village based small businesses making natural body oils and hair oils etc formulated and presented in a rudimentary way, plus the large manufacturers of bodycare products often based on poor quality ingredients, herbal medicines largely sold as dried or semi processed as raw materials etc... is still the bulk of the natural products used in the majority of homes. However there is a significant middle and higher income earning consumer demand for well formulated and attractively presented bodycare products, herbal medicines/ supplements, fragrances and other domestic products. Most of these products are currently imported, there are a few companies (some of which are based in the HECA-ASAL region) developing in Kenya producing a small volume, high quality natural products mainly aimed at the tourist industry and high income earning and ex-patriot section of consumers.

1.3 High potential rangeland products in the Borana and Guji regions

The assessment of the two areas, using the selection criteria designed for the field work to select the rangelands products with the best potential, involved information gathering from pastoralist communities and, natural products producers groups, traders, relevant government line departments, non-government development actors operating in the area. In general, the assessment result indicated that there are similarities...
in the rangeland resources across the areas visited and the following can be summarized as the major ones of greatest potential for future development intervention;

- Gums and resins (gums arabic, frankincense, myrrh)
- Aloe (indigenous species) domestication for healthcare and bodycare products
- Beekeeping (although currently low level)
- Ethnobotanicals medicinal plants for health supplements, remedial human and livestock products

Although the semi-arid lowlands are predominantly occupied by pastoral and agro-pastoral population whose livelihood is mainly dependent on range livestock production, a number of households (demonstrated in the study) in the targeted districts collect gum arabic and aromatic gums and resins, from long tradition, and some cultivate small areas of land close to water courses for annual crops.

1.4 Interventions required

For support agents to coherently and responsibly develop community owned/participated plant based rangeland products enterprise there must be fully knowledge of what is entailed in setting up and developing the business operations to market quality and statutory compliant standards. There must also be sufficient capacity with which to develop the necessary training and extension support, infrastructure and equipment, trade finance and operating capital. As for many other similar models across the world, this can be achieved through a combination of public and private investment, grants and loans. A collaborative rangeland enterprise development initiative will need to take full regard of the main facets of a business development, be based on strategic partnerships, and carefully designed support activities that are time-framed and budgeted. A full assessment of the resources and commitment of the core parties should be made during a pilot phase, and full funding and implementing partnerships secured, particularly those that can aid the successfully adoption and implementation of the commercial bio-enterprise activities, such as landowners, owners of the existing bio- enterprises, resident CBOs and other active NGOs/institutions operating in this region.

1.5 Way forward

For the ELSE pastoral livelihoods programmes to assist pastoral and agro-pastoral communities to improve their ability to adapt to the changing environmental and social conditions in the rangelands, the programmes need to incorporate income diversification strategies and activities based firmly on commercial grounds and provide exact and reliable information and exposure to enable these communities to understand, evaluate the cost-benefits of the alternative, additional and complimentary enterprise for natural products business options. So enable communities to move forward it is necessary that correct and appropriate facilities and equipment are sourced and constructed, planting materials of correct genotype, producer groups, extension staff and operators are sufficiently training and assisted with technical and management advice throughout the pilot period.

As clearly demonstrated across the ASAL, due to the largely unviable investment conditions of these areas it is necessary that there is a certain level of development or government driven assistance applied to these opportunity cost areas in order to raise the business potential sufficiently to attract private sector partnerships. In the absence of private sector investment, support to these initial opportunity cost areas is likely to make the difference between success and failure of any new enterprise type, and can be seen as a highly legitimate application of development funding. Once the conditions are achieved to engaged commercial partnerships, care should be taken to ensure that partnership are based on transparent and equitable agreements. Partnerships with relevant NGOs and government departments continue to be important through the first development phase.

From the onset of the commercial projects, detailed assessment of the selected product types and feasibility study must be made, commercial trials should be conducted for the cultivated/domesticated natural products, and sustainable wild harvesting protocols determined and methodologies developed for the indigenous natural products, to provide basic data to test the viability of the targeted natural products. These enterprises should then be developed as commercial pilots and monitored over a given period. At the end of the pilot periods, the initial trials information can be built on and adjusted to provide sound data for the drafting of full business plans for the communities and investors to assist the scaling up of the successful enterprises. Throughout the pilot period, training, management assistance and organisation support will need to be provided to the communities engaged with the targeted enterprises. On-going support will be needed after the pilot phase, i.e for at least for 5 years, to enable effective building and strengthening of the organizational structure of the participating
community members and sound develop the value chain to maximize economic returns to community groups, product development and marketing.

2. Background

2.1 Natural products development in Ethiopia

The opportunities in the African and international markets for indigenous plant based product are of particular relevance to producers in Ethiopia. The country is already highly regarded in the international market for its unique natural resources, indigenous botanical materials and diverse growing conditions. High value and value added production is also especially relevant to where freight costs are comparatively high, on an international level, and labour costs are relatively low. High value crop production for producer group operations is relevant where rising land pressure and numbers of single headed households are increasing.

Table 1. Issues associated with the development of this sector

<table>
<thead>
<tr>
<th>BARRIERS TO PROGRESS</th>
<th>ASSETS TO PROGRESS</th>
<th>SECTOR OPPORTUNITIES</th>
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<tr>
<td>Lack of expertise.</td>
<td>Availability of land.</td>
<td>Export of high value products endemic to Ethiopia</td>
</tr>
<tr>
<td>Strong national and regional price and under supply leading to marketing of poor quality products</td>
<td>Wide climatic and environmental diversity - excellent growing conditions</td>
<td>Export of high quality products due to excellent growing conditions</td>
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<tr>
<td>Chronic shortage of foreign currency and limited foreign exchange.</td>
<td>Strong co-operative structures</td>
<td>Value adding to primary products - high labour input.</td>
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<tr>
<td>Relative high freight costs</td>
<td>Established agri-sector export operations comprising large numbers of producers</td>
<td>Export of dry products - long shelf life and easy to transport.</td>
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<tr>
<td>Lack of agricultural and agi-business information.</td>
<td>Lower relative cost work force.</td>
<td>Export to premium international organic and fair-trade markets.</td>
</tr>
<tr>
<td>Lack of access to specialist equipment and advise</td>
<td>Good agricultural land.</td>
<td>Expansion in the national and regional markets (price and demand is strong for a number of high value and value added products).</td>
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<tr>
<td>Lack of market intelligence</td>
<td>Support from development bodies and NGOs.</td>
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<tr>
<td>Lack of infrastructure</td>
<td>High value endemic species already established as traditional export products.</td>
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<td>Weak middle sector industry to provide processing, packaging facilities.</td>
<td>Sound economies of scale in some product sectors</td>
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<td>Product adulteration</td>
<td>Development of e-commerce</td>
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2.4 Government Policies and Strategies

2.4.1 International policies relating to the wild harvesting of indigenous plant materials

CITES, managed with the national wildlife services, provided the legal framework for all CITES listed endangered plants, and for these species there is limited opportunity for commercialisation. The case of indigenous CITES listed species approved for sustainable utilization and commercialisation, CITES requirements include proof of exploitation from sustainable source. In some countries in the region, such as Kenya, the government has brought about a national Act to protect and guide wildlife conservation and management; such as the Wildlife Conservation and Management Act under which there is now a regulation framework and licensing system for the domestication and exportation of indigenous plant materials/extracts.

2.4.2 Cooperatives Act

The current policy framework for rural economic development is conducive to promote smallholder market creation and it is critical that such enabling policy environment remain in place and translated into action for the success of the project. The proclamation No 147/1998 issued by government stated that cooperatives should be organized according to cooperative principles issued by the international cooperative alliance. As demonstrated in a specific study conducted by SOS Sahel, the most politically and economically (in the political environment) viable method setting up, particularly for the establishing phase, producer owned commercial enterprise is the government supported co-operative system. However, as seen across the country, these are often poorly managed and malfunctioning co-operatives, with major deficiency in their operating and management capacity when lead solely by government and civil institutions due to their own internal finance and manpower challenges, etc. Therefore it is necessary to assist the instigation and growth of functional and efficient design,
operating systems and management capacity is critical in the future success of the co-operatives and their commercial activities.

2.5 Other pastoral livelihoods development initiatives and studies in the region

2.5.1 Honey Production
SOS Sahel Ethiopia has been working in Borana and Guji zone through Borana Collaborative Forest Management (BCFMP), the second phase of BCFMP; Participatory Forest Management Programme (PFMP) was a joint effort with FARM-Africa, who is involved in similar PFM initiatives in Bonga (SNPNPR) and Chillimo (Oromiya). The new project “Enhancing Pastoral Environmental and Livelihood Rights in Borana and Guji Zones (April 08- Dec10) focuses on the management and utilization of natural resource aiming to diversify and improve pastoral livelihoods through the value chain development of NTFPs; mainly honey. The project started to be implemented with in Borena (Yabello and Arero districts); and Guji zone (Liban district) funded by Norwegian Peoples Aid (NPA). The purpose of the project is to contribute for the enhancement of pastoral environmental and livelihood rights through sustainable natural resource management by developing participatory natural resource management plan, enhancing local PNRM stakeholders capacity (technical and institutional), and diversifying and improving pastoralists livelihood through commercialization of NTFPs. Under this initiative, SOS Sahel has organized 9 Bees and Bees Products Development and Marketing Cooperatives with a membership of 613 pastoralist beekeepers and an apex structure, a Cooperatives Union. Currently, the 9 cooperatives have been provided a certificate of legal entity by the concerned government body. Pastoralist beekeepers also trained on modern bee management and products diversification, comb honey collection centre organized, and a central processing and marketing centre establishment at Yabell town is underway. Pastoralist beekeepers are highly motivated and actively participating in the development process since they are convinced that beekeeping is the better option as alternative source of income which can improve their livelihoods significantly. The program is also supported technically by Oromia Forestry Enterprise (government body) as they are the main partner in the design and implementation of the project.

Pastoralist Concern Association Ethiopia (PCAE) is a local non-governmental organization established in 1995, by few development oriented individuals who are dedicated for pastoral development and also belongs to the area (brought up in pastoral area and know their problems). It has developed a few small development funded projects in Somali Region with the Spanish support arm of Oxfam, Intermon on Disaster Prevention and Preparedness (DPP) and advocacy. The activities have included a small scale bee keeping projects.

2.5.2 Rangeland Natural Products Development
SOS Sahel Ethiopia started implementing a pilot project “Value chain empowerment through women-led initiatives in pastoral communities of Borana” that has been designed to assist the development of community owned bio-enterprise in gums and resins, which includes improving the collection, storage, processing and marketing aspects, and also bio-enterprise development in sustainable wild harvest and domestication of indigenous aloe species. The overall purpose of the project is to contribute to the poverty reduction, economic empowerment and social wellbeing of pastoralists, particularly women, in Yabello woreda of the Borana lowlands through value chain development of NTFPs. The program is funded by Oxfam Canada, first phase March 2008 – February 2009 and the second phase is from July 2009 – June 2012. The expected impact of this project is the improvement of pastoralists access, especially women, to fair and sustainable natural products market. This will be achieved by increasing incomes of 500 households by at least two-fold in Borana through the establishment of women-led business enterprises. The project focused in its first phase on market research, product identification and development; providing support for group formation and technical input.

The target beneficiaries are poor households in Ade-Galchat, El-Waye and Dida-yabello PAs/villages in Yabello District where highest concentration of the gum and incense source trees and aloe plant is found in abundance. About 500 households (with about 2500 household members) in the three villages are directly targeted for project intervention. The proposed intervention also target, private sector (local merchants and exporters), market cooperatives and local government staff that have been directly involved in non-timber forest products (NTFPs) harvesting and marketing including aloe soap, incense and gum/resin products. Thus, indirectly some potential members and other value chain actors like traders, inputs suppliers and potential co-operative members indirectly benefit from this project. The project achievements so far are summarized below;
Rangeland Enterprises in the Drylands of Ethiopia

- 445 pastoralists HHs organized into business cooperatives in Yabello District of Borena Zone at three villages/PAs that engaged in producing soap from Aloe, & Gum/resin and incense products. Among the total pastoralist HHs organized into commercial entities, 354 women and 91 HHs are men.
- Learning/cross visits organized to rural enterprises initiated by other women groups in Tigray and Amhara regions who have demonstrated business experience in similar NTFPs such as gum and aloe soap production. 16 participants of the learning visit were from government line departments of Yabello District including Pastoral Development Office, Women’s Affairs Office, Cooperative Promotion Office, Administrative Office, Development Facilitators (DFs) from gum and aloe sap soap production areas, Community members from three PAs (gum and aloe sap soap production areas) representatives from each PA, the Natural Gums Marketing Enterprise, staffs from SOS Sahel Ethiopia, Yabello Field Office,
- Business plans prepared for the three cooperatives with full participation of the cooperatives leaders and with full understanding and knowledge of the entire members,
- The analysis of current common property right regimes and control mechanisms for harvesting of products is conducted by a botanist with long experience in Aloe species identification and product development. Then, with financial support obtained from Trocaire/Cafod, the same consultant who trained the project staff on aloe sap soap production.
- Rapid assessment conducted to identify alternative mechanisms for delivering financial services in the project area to increase outreach and make sound impact on sustainable utilization of natural products.

2.6 Examples of Bio-enterprises in Ethiopia

Beza Mar is one of the largest traders and exporters of honey. Part of the supply is now certified organic, through support of a SOS Sahel project. Beza Mar is expanding its processing centre and areas of collection across Ethiopia, focusing on organic and fairtrade supply, and working in hand with relevant private and development sector partners.

Ariti Herbal Company was established in June2000 by Dr. Ermias Dagne who is the General Manager of Ariti Herbal Company and a professor of Biology at the Addis Ababa University. Dr. Ermias has conducted significant and formative research of medicinal herbs, gums and resins at the university. The company formulates and retails a range of herbal medicines, massage oils, herbal extracts and cosmetics. Retail is made through the shop in Addis Ababa. Some raw materials are produced on 1 ha of land, essential oils are distilled at the processing centre from olibanum and myrrh.10 liters of olibanum and 3 liters of myrrh is exported annually..

Agri-CEFT Plc is part of the MIDROC Ethiopia, an investment company established in September 1996. Agri-CEFT owns the largest commercial tea plantations in Ethiopia, which are Wush Wush and Gumaro. The company also produces herbal medicines, such as “Endod” (phytolacca dodecandra), claimed to be effective against Bilharzia and Mosquito. Research trials are conducted with the European pharmaceutical company

Teppo Agriculture and Trade Plc has focused on the production and export of fresh vegetables to the European Market, Middle East. The company also multiplies high yielding crops and vegetable seeds, supplies farmers and imports vegetable seeds and agrochemicals. Recently Teppo has started to produce, process and promote the moringa tree for medicinal use in the Ethiopia nutraceutical market.

TERRA Plc was established in 1992. The 40 hectares farm, in two locations, is producing horticulture (vegetable, fruits such as apple, peach, pear, nectarines, plums and berries) for the Addis Ababa markets. The company is also in production of vegetable. It produces medical plants and essential oils – Rosa Damascus.

Aromabyssinia Plc extracts and exports essential oils to the international markets. The company has a small laboratory facilities for product development and distillation units. The company has so far extracted samples of about 20 essential oils and sent 13 samples to France. Of these, an order has been received for 7 oils. The company is also working on developing international certification to add value to its product.
3. Assessment of Existing Rangeland Enterprises in the Drylands of Ethiopia

Source: Field work information Yabello, Moyale, Negelle

3.1 Assessment of existing rangeland enterprises in Borana and Guji Zones

3.1.1 Overview

Although the semi-arid lowlands are predominantly occupied by pastoral and agro-pastoral population whose livelihood is mainly dependent on livestock production a number of households in the study districts, collect gums and frankincense, cultivate crop and engaged in mineral exploration activities. Apart from livestock and livestock products (mainly cattle, sheep, goats, camel and milk) and small scale informal mineral exploitation, a range of agriculture, plant based products include the following:

- Bee keeping is found to be very uncommon in Dirre and Moyale districts, while there is an emerging interest in Yabello and Liben zone, some families have tradition hives. Some modern hives have been seen, distributed by past development initiatives
- Gum arabic, frankincense, myrrh
- A few small groups developing indigenous tree seeds collection and marketing – NGO driven.
- There is a women’s group developing small enterprise in aloe which has been recently set up and trained by SOS Sahel, although no commercial use of the aloe has been recorded prior to this

3.1.1 Gums and Resins

The lowlands are endowed with a rich diversity of plant species in the genus Acacia, Boswellia and commiphora with some of the species being major sources of the above commodities. Collection and sell of gum Arabic, frankincense and myrrh by the local communities has been going on in the area for quite some time. Indeed the Natural Gum processing and Marketing Enterprise (NGPME) and various small scale merchants at both village and major market centers are buying and selling these commodities.

All the commercial gums, frankincense and myrrh are produced from natural stands and by natural exudation. Gum Arabic is a product of Acacia Senegal var. Kerenisis (plus limited quantities from var. Senegal in Yabello) and A.seyal var. fistula. Commercial Acacia gums are also produced from A.drepanolobium and A.mellifera which are major adulterants in gum arabic. Frankincense is of different depending on the species of Boswellia.

There are five types of frankincense produced in Ethiopia but the one from Boswellia neglecta is the most common in study areas. It is predominantly black in colour and hence called black frankincense. White frankincense is collected in the region but quantities are relatively small and are usually mixed with the neglecta. Myrrh is oily gum resin exudates which drips and forms lumps/tears of varying sizes and color (red, brown to dark brown). Myrrh is produced from commiphora myrrha and comes predominantly from the Somali region and also from Liban and Arero woredas.

3.1.2 Aloe

In the southern Ethiopia, including the study districts, wild aloe species can be observed growing over vast areas. However, there is very little awareness of the commercialization of this ample resource by the resident and transient communities. Apart from a small pilot project instigated by SOS Sahel that focused on aloe commercialisation and product development, currently there is no commercial harvesting, production, handling and processing of indigenous aloe species in the study areas.

3.1.3 Beekeeping

Even though beekeeping practices highly constrained by lack of water and forage honey is being produced by some pastoralist in the area using KTBH (Kenyan Top Bar hive), as well as the traditional log hives and this subsector also promoted by NGOs working in the areas. There are some organised bee keeping enterprises which provides the immediate potential for increasing the supply and the quality of both the honey and wax through the development of well structured supply chains, and the construction of facilities and uptake protocols for handling, processing and storage. Marketing the comb honey, well packaged and presented with storyline, as a branded product to the national market would be a possible first rung in the commercial development of this product.
3.2 Assessment of gum arabic and aromatic gums and resins enterprise development

3.2.1 Overview and rational for selection

Borana, zone, Liben district and Somali areas has distinct climatic conditions which have given rise to an abundance of gum and resin yielding Acacia, Commiphora & Boswellia species, including international valued myrrh and frankincense species. According to Hunde and Thulin (1989) there are 14 species of Acacia, 6 species of commiphora and 3 species of Boswellia are found in the study areas. Two major groups are distinguished in the gum sector: (i) gum arabic and (ii) aromatic gums and resins. In Borana and Gujji zones, gums and resins are some of the few commodities that are produced solely for trading on the international market. These resins and gums are mainly sourced from the Acacia, Boswellia and Commiphora plant species. In the study woredas the following species are present:

- Acacia Senegal var. kerensis, var. Senegal – gum Arabic
- Acacia Seyal var. fistula, var seyal – gum arabic
- Boswellia neglecta - black frankincense
- Commiphora species - myrrh

At the community level, collection of the gums and gum resins is considered a poor man’s activity and yet it is the more affluent members of the societies who are involved in the buying/selling. Lack of information about market requirements and general knowledge about collection as well as post-harvest handling has meant that low quality commodities continue coming to the market resulting in rejection or low prices. The resources are threatened by increasing degradation, predominantly through clearing for expanding agriculture, over-grazing or cutting for other uses. If not checked, removal of these resources will lead to further degradation of the already fragile ecosystem. Meanwhile, the area continues to suffer from lack of diversification in resource utilization with poverty levels remaining among the highest in the country. Concerted effort is therefore required to make sustainable enterprise in gum arabic and the aromatic gums and resins a more viable economic activity in the Borana lowlands.

The sector presents a high relevant and niche opportunities because gums and gum resins are produced only during the dry season when forage is scarce, farming activities are low keyed, and therefore, when the communities have the time and interest to engage in other meaningful activities.

Gum Arabic is defined as a dried exudation obtained from the stems and branches of Acacia Senegal (L) Willdenow or Acacia Seyal. For the purpose of marketing, good grade gum Arabic from A. Senegal is in the form of whole, round tears and pale to orange in colour with a matt surface texture. Gum Arabic from A. seyal is more friable and is rarely found in whole lumps.

Traditionally, Gum Arabic is eaten as food by herdsmen, women or children in the bush away from any settlement. Wild animals especially monkeys and baboons have been spotted nibbling at the nodules from trees. It is also used as medicine to ease joint and back pains. Commercially Gum Arabic is used in the confectionery products to prevent crystallization of sugar (e.g. ice crams), as emulsifying and stabilizing agent in soft drinks industry (e.g. Coca-Cola), to prevent oxidation of lithographic plates in the printing industry and as an adhesive (e.g. office glue), among others. Examples of applications include:

- adhesive thickeners;
- thickeners, stabilizers, flavor, fixatives and emulsifying agents in food products;
- clarification in beverages;
- release agents for rubber products;
- Formulations in cosmetics.

Aromatic gums and resins contain odiferous substances. Olibanum, myrrh and oppopanax belong to this group. They are the hardened, resinous exudates obtained from trees of certain Boswellia and Commiphora species. They are employed for domestic uses as well as for export. Their domestic use is mainly in religious rituals and in traditional coffee ceremonies to produce aromatic smoke, for which mainly boswellia, olibanum and to a lesser extent the commiphora species are used. Myrrh is also used in traditional medicine. The gums and resins can also be distilled to yield volatile oils and these have their own characteristic, balsamic odors, which are used in perfumery.

Myrrh is oily gum resin exudates which drips and hardens to form lumps/tears of varying shapes and sizes. Tears vary in colour from red, brown to dark brown. Red and brown tears represent the best grades. Myrrh has
a variety of local uses which include preparation of ink used in Quran schools (Madrassahas), burning in homes to repel snakes and offensive insects or as medicine. It is also processed into essential oil for medicinal preparations, fragrance and flavours industries.

**Frankincense** is of different types depending on the species of Boswellia. There are five types of frankincense produced in Ethiopia but the one from Bosewellia neglecta is the most common in Borana zone. It is predominantly black in colour and hence called black frankincense. The species also produces white frankincense but the quantities are relatively small and are usually mixed/ masked in the black type. Depending on the method of post harvest handling, the tears can stick together to form large lumps.

White frankincense is chewed occasionally by local people. The most common local uses include burning as frankincense, preparation into local perfumes used by women or in preparation of herbal medicines. Commercially it is an important component in the cosmetics and perfumery products including various medicinal preparations.

3.2.2 Description of the resource:

All the commercial Gum Arabic, frankincense and myrrh are produced from natural stands and by natural exudation except for Humaera type Gum Arabic and Tigray type olibanum where organized tapping has been developed. Meanwhile, apart from initiatives to map put gum and gum resin producing areas in the mid and crude estimates on potential areas (Fitwi, 2000), no accurate information exists on the resources which can be used to guide on management.

The highest concentration of gum arabic, frankincense and myrrh resource is found in Arero Woreda around Wachile, web, Dhaas, Borobor and Uudat production center. Second in importance is Dirre Woreda around Erder, Bokku Lubooma, Gayo, Igo, and Dubuluqq production centers. Yabello Woreda is another important area with gum and frankincense resources found within Aeedee – Galchat and Elwaya production centers. It seems that the resources in Yabello extend Westwards in to Telttele Woreda and a discussion with a gum merchant revealed that the resources are found in Birindaar and around Telttele market center. There is also Liban Woreda on the border with Arero revealed a good potential around Malka Guba center and along river Dawa (Ben Chikamai, 2003)

*Boswellia neglecta* is the major source of an incense product, internationally known as black frankincense - it can be a tree with many branches or a shrub of up to 6 metres height. Typically the branches emerge near the base. Its product is predominantly a black incense and in smaller less significant quantities it produces a white gum incense as well. Up to the present time there have been no deterministic studies to ascertain the extent of the resource of Boswellia or any of the other marketable gums and gum resins. All commercially known gums and incense are produced from stems and branches by a process known as natural exudation. Six species of Boswellia occur in Ethiopia; B. papyrifera, B. neglecta, B. ogadensis, B. microphylla, B. rivae and B. pirrotae. All except B. pirrotae are known to produce commercial frankincense. B. papyrifera and B. pirrotae are predominantly found in the north while the rest occur in the south and south east of the country. Frankincense from B. Papyrifera is locally known as Tigray type olibanum, the one from B. ogadensis as Ogaden type olibanum and from B. rivae as Boorana type olibanum (Fitwi, 2000). However, recent field appraisal has revealed that B. neglecta is the major source of Borana type frankincense.

*Commercial Acacia* gum from Ethiopia is produced from four botanical sources Senegal, A. seyal, A. Polycantha and A. drepanolobium. A Senegal gum is of two types; Humera and Boraan. The former is produced mostly from A. sengal var. Senegal in the north (Tigray and Amhara regions) while the later is from A. Senegal var. kerensis in the south and south East ( Borana Zone and Somali regions). A. seyal gum is mostly from Borana zone (Arero and Yabello Woredas). A. drepanolobium gum is produced essentially from the south in Yabello Woreda. Myrrh is produced from Commiphara myrrha and commes predominantly from the Somali region but also from Borana zone (Liban and Arero Woreda). Myrrh (Agili),

*Commiphora species*, know as sweet myrrh or oppoponex in the international market, is available primarily from Melka Ghuba and Moyale in Region 5 and Negelle and Wachile in Region 4. Commiphora myrrh is a highly prized in the international marketplace and is an export product. Generally though compared to the other gum and gum resin resources the productivity is low. There is no organized collection specifically of myrrh, when there is drought it is very scarce, and when found there is a serious problem of adulterations. Also, due to their
relatively high value, compared to other products handled by the communities, the gums and resins are mostly smuggling over the border to Somalia. It is found in far richer quantities in the Ogaden, than in Borana where only relatively small quantities are available.

<table>
<thead>
<tr>
<th>Scientific Name</th>
<th>Local Name</th>
<th>Commercial Potential/Product Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acacia Senegal var Senegal</td>
<td>Golole</td>
<td>Gum Arabic</td>
</tr>
<tr>
<td>Acacia Senegal var kerensis</td>
<td>Saphansa Lima</td>
<td>Gum Arabic</td>
</tr>
<tr>
<td>Acacia Seyal var fitula</td>
<td>Wachu gum</td>
<td>Gum Arabic</td>
</tr>
<tr>
<td>Acacia Seyal var seyal</td>
<td>Challo</td>
<td>Gum Arabic</td>
</tr>
<tr>
<td>Acacia Mellifera</td>
<td>Saphansa Galachi</td>
<td>not traded inferior quality</td>
</tr>
<tr>
<td>Acacia Drepanolobium</td>
<td>Fulensa</td>
<td>not traded inferior quality</td>
</tr>
<tr>
<td>Acaca Polycantha</td>
<td>Gumolo –Tigrayan</td>
<td>Small quantities local consumption- sweets and candies</td>
</tr>
<tr>
<td>Boswellia neglecta</td>
<td>Hancha</td>
<td>Black Incense – most common species found</td>
</tr>
<tr>
<td>Boswellia cartia</td>
<td>White frankincense</td>
<td>Not Found</td>
</tr>
<tr>
<td>Boswellia papyfera</td>
<td>Tigray type Gomolo</td>
<td>'Olibanum'</td>
</tr>
<tr>
<td>Boswellia rivea</td>
<td>Dakara</td>
<td>Ogaden- type incense</td>
</tr>
<tr>
<td>Boswellia microphyllly</td>
<td>Ogaden type</td>
<td>Ogaden- type</td>
</tr>
<tr>
<td>Biswellia pirotte</td>
<td>Gabez</td>
<td>Small quantities found</td>
</tr>
<tr>
<td>Commiphora Myrrha</td>
<td>Kumbi</td>
<td>Myrrh</td>
</tr>
<tr>
<td>Commiphora Corrugata</td>
<td>Ilka Bugis</td>
<td>Myrrh</td>
</tr>
<tr>
<td>Commiphora Crenulata</td>
<td>Siltacho</td>
<td>Myrrh</td>
</tr>
<tr>
<td>Commiphora Paolii</td>
<td>Argasu</td>
<td>Research ongoing into insect repellents</td>
</tr>
<tr>
<td>Commiphora Africana</td>
<td>Hammessa</td>
<td>Myrrh</td>
</tr>
<tr>
<td>Commiphora Fluviflora</td>
<td>Chalanka</td>
<td>Myrrh</td>
</tr>
<tr>
<td>(Commiphora Habessinica)</td>
<td>Abuked</td>
<td>Oppoponex</td>
</tr>
</tbody>
</table>

3.2.3 Collection
Collection is usually carried out by mainly by herders, poor pastoralist and lately by members of the gum and resin cooperatives organized in different areas. Private traders also tried to higher collectors and collect the products even though they were not successful. The reasons they mentioned for the failure were the hired workers unable to work in the harsh climatic condition, lack of water and infrastructure. The number of collectors usually increases during times of famine or when market price is good. However, in Wachile, web and Yabello centers a group of pastoralist peasants (mostly with very few livestock) have focused their efforts on collection and sell of Gum Arabic, frankincense or myrrh on a full time basis.

All the three commodities are not tapped and collection is from natural exudation or other forms of injury. Production is during the dry seasons; mid December- Mid March and Mid June – Mid September. Good collections from A. Senegal are realized in the dry season of December -March and June – September for a. seyal. It was learned further that collection of frankincense continues during the rain season when livestock move to the wet season grazing areas since it is not affected by rains as for Gum Arabic.

No special equipment is used for collecting any of the commodities. In most cases, gum is removed from the tree by hand, and if hard, an axe or machete is used. Occasionally, the commodity is collected from the ground below the tree where it has dropped and solidified. Such commodity has a high content of soil or sand. There are also no special or dedicated containers used for collection in the field though some experienced collectors use sacks for gum Arabic and plastic containers for frankincense and myrrh.

The commodities are sold directly to the merchants or kept temporarily in the homes prior to selling. As regards capacities, a good collector can collect 5kg/ day of gum Arabic (Hamphe), 7 kg/ day of frankincense (Hancha) and 3kg/ day of gum myrrh (kumbi) on average. Collectors can increase production whenever there is increased
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demand. The low yield of kumbi is due to the fact that only a few trees produce naturally at a given time. This means that yield can be increased considerably through tapping. The low yield of hamphe from Senegal is attributed to the thorny nature and hence difficulties of easy access to some trees requiring that future improvement should focus on suitable tools for clearing excess branches to access the trees. Also the gum is preferred as food by people and monkeys who in some cases remove large quantities. However, production of gum Arabic from A. seyal (challo) seems to be high (10kg/ day) and access to and the density of the trees is also high.

Virtually all the collectors interviewed do not have information on the market requirements of the various commodities. There is very little information on the market requirements of the various commodities. There is very little information on the need to collect and keep separate gums from different species of Acacia, frankincense from Boswellia and myrrh from different species of Commiphora. Most of the collections on Gum Arabic were observed to contain samples from more than one species of Acacia while collections of frankincense had a mixture of samples of B. neglecta but also samples from Commiphora species (C. forrugata, C. crenulata, C. paolii and probably C. Africana).

Additionally, samples of gum Arabic were observed to contain other samples which were distinctly of different color (dark brown), finger/ slimy or rainied on as well as other forms of foreign material e.g. sand or bark. Bark was also the most common form of foreign matter observed in collections of frankincense (Hancha). This was followed sand of soil. All these aspects generally lower quality of the commodities and greatly affect the prices offered. According to the local community in Adegalchat, ie the pastoralist/collectors, the Natural Gum Processing and Marketing Enterprise (NGPME) is a major and mostly sole buyer of the gums and incenses in the area. Nationally they hold the largest market share of 40% with the remaining larger 60% shared amount a dozen or so trading companies. Currently (April 2007) the price for a kilogram of gum from A. Senegal, A seyal and B. neglecta is sold at between EB 1.25 – 2.00. The higher price representing an unusually high payment paid for an unadulterated pure kg of the higher value gums. The major constraints mentioned for the production of gums and incense are mainly logistical (water and transport). The pastoralists also expressed problems in gaining the knowledge to improve the yield and quality of these wild harvested products.

Collectors sell their produce either to cooperatives, NGPME, village merchants or trader who take to central market at major production centers; Malka Guba, Uudat, Wachile, Web, Dhaas, Borbor or Bokku Luubomma, yaballo and Negalle. To provide some insight about the quantity and average buying prices of the three natural products by NGPME of Yabello branch presented in Table 1 below.

<table>
<thead>
<tr>
<th>Product name</th>
<th>Local name</th>
<th>Yearly purchased from different sources</th>
<th>Quantity (Quintal)</th>
<th>Average Price (Birr)</th>
<th>Quantity (Quintal)</th>
<th>Average Price (Birr)</th>
<th>Quantity (Quintal)</th>
<th>Average Price (Birr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frankincense</td>
<td>Hancha</td>
<td>2009</td>
<td>674</td>
<td>5.50</td>
<td>502</td>
<td>4.50</td>
<td>342</td>
<td>3.50</td>
</tr>
<tr>
<td>Gum Arabic From Acacia Senegal</td>
<td>Hamphe</td>
<td>2008</td>
<td>102</td>
<td>6.50</td>
<td>207</td>
<td>6.50</td>
<td>351</td>
<td>6.75</td>
</tr>
<tr>
<td>Gum Arabic From A. seyal</td>
<td>19</td>
<td>5.50</td>
<td>18</td>
<td>5.50</td>
<td>58</td>
<td>3.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myrrh</td>
<td>Kumbi</td>
<td>-</td>
<td>20-24 range</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: NGPME, Yabello Branch.

Although gum myrrh purchase not reported by the enterprise, the other branch of the enterprise, Nagalle branch reported most of the myrry the enterprise purchase has come from Liben district and Somali region. Recently the enterprise collects large quantity from the cooperatives. And some times the cooperatives also sell to the private traders function in the areas.

### 3.2.4 Environmental Considerations

Regardless of the enormous socio-economic importance of frankincense and some of the other gums and gum resins, very little attempts, if any, have been made to promote sustainable utilization, development and conservation programmes to guard the resource. The production of the gum resources is still sourced from
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resources growing in the wild. No research has been conducted on the production of these gums and gum resins through ranching and planned cultivation. No cultivated stands have been developed.

The methods used to tap and collect the natural gums are very rudimentary and traditional, which involve very outmoded techniques. Up to the present time there are no projects focusing on environmental conservation in place to sustainably improve the yield and quality of the product or to conserve the trees in the areas from various degrading factors. There is, neither, a viable strategy or plan developed to promote the conservation of the sustainable utilization of the species or their habitat. As a result, observed during the field visit, the gum and gum resin producing species and their habitats have fallen victim to deforestation. This has mainly been through human induced recurrent annual fires and/or the clearing of forests or woodlands for expanding crop cultivation as well as the cutting of trees and shrubs for fuel and construction material by the local communities. The reality of the level of degradation of the gum resource areas that have yet to be faced that have not received sufficient attention in the past.

All the above mentioned factors have led to a decline and disappearance of landscape that host gum and gum resin bearing species. Unless financial emphasis is placed on conservation strategies and establishing sustainable wild harvesting protocols, there will be a serious loss of these resources; within this decade there will be little of the remaining gum and resins tree species populations left.

3.2.5 Traders

Four types of actors involved in the business in the study areas. The first one is NGPME; this company has two branches one in Yabello and the other in Nagelle. The second actors are the gum arabic and gum resin marketing cooperatives. The third actors are private traders which play a lead role as NGPME and situated in different towns; the last one actors are the retailers engaged in the business on and off and usually supply to the former three actors. Retailers at production centers handle variable volumes depending on capital outlay, market demand or availability of the three commodities. Although information on the total volume bought by all actors, from the assessment made by Ben Chikamai in 2003, revealed that Frankincense is bought in the highest quantities and successful retailers individually bought volumes ranging from 10- 30 MT in a year for the period 2000-2002. This means that the average volume of frankincense bought by 15 merchants who are active in the sector from Borana zone varied between 150 – 450 MT during the period. The potential for increased production of frankincense is much higher from all the production centers if prices are increased. Meanwhile, despite the high potential of Gum Arabic from a. senegal, volumes bought are generally low. Most merchants are not buying Gum Arabic from a. senegal due to lack of sufficiently rewarding market outlets in Addis Ababa and Nazareteth. However, as seen in the table above, the recent trend demonstrates that higher quantity of gum arabica is sourced from a. senegal than from the a. seyal. The third commodity, Myrrh is only bought by merchants at Malka Guba and Nagelle; volumes are generally very low.

3.2.6 Post harvest handling and processing

Current system: The harvested gums and gum resins are stores in the individual homes and stores at the village level harvesting site. Different gums are sometimes mixed together and not differentiated by species type. Post harvest handling of the Boswellia (black incense) is the same as for the Acacia (gum arabic), no cleaning of the product of foreign matter, dust and dirt is undertaken by the collector. It is then transported to permanent stores owned by NGPME or private traders for sorting, grading and processing. This is again undertaken on an individual basis by the collectors who either sell what they have collected to NGPME or the private buyers and traders in nearby town. One buyer of gums and resins in Negelle reported that after cleaning the exudates he bought from pastoralists. He extracted approximately between 50% and 70% of sand, sticks and mud, thus remaining with between 30-50% of the original mass. He gave this as a reason for his poor price he paid by to the collectors.

Gum Arabic once purchased from the pastoral herder suppliers in the Borana zone it is normally sold as cleaned grade though occasionally it is graded into two grades; large and small pieces. Black frankincense is usually sold with very limited cleaning. However, myrrh is normally cleaned and sold into five grades, due to its higher overall value. In general, post harvest handling (value addition) is carried out by nation merchants/ exporters. Operational costs by national merchants / exporters include; purchase price, cleaning/ sorting, packing, transportation, loading/ unloading, tax for local market, documentation and sometimes freight for export consignments. There are also post harvest losses of between 18-30 %. Processing of the gum and resin
involves the manual cleaning, sorting and grading of the raw products, this work is usually done by women temporarily employed by traders. The processing equipment comprises of mainly different sized mesh trays, with wooden frames and metal gauges the processing was mainly undertaken by women at the National Gum Processing and Marketing Enterprise (NGPME).

**Proposed system:**

*Depot centres:* The construction of depot centres in key locations to serve the product groups clusters (focal areas of production/sustainable wild harvesting) is fundamental to harnessing the opportunity to develop full potential of all products discussed.

It is clear that a *central processing facility* will assist producers to meet the market demands for sustained quality and supply; i.e to ensure correct and consistent product handling, final grading, high level maintenance of quality and hygiene standards, processing and packaging and storage conditions. It will also serve to consolidate consignments and to serve the market outlets effectively, transparently and commercially competently. Several enterprise could also utilise the same centre and share the operating overhead costs of operating the centre and its facilities. The centre can also act as a commercial income generating entity in itself by providing demonstration, training and as an eco-tourism attraction (including a natural products retail outlet.

*Whole bulk product:* The equipment for the commercial production of gums and resins for bulk sales is very simple and fundamental. The most important aspect is that the collectors use a separate bag for each species of gum and resin. Once received at the processing centre the only requires are grading tables, weight scales and sieves. Basic grinding equipment should be purchased for the lowest grades of gum arabic so that a powdered product can be obtained and marketed.

*Essential oils from gums and resins:* The equipment requirement for the commercial production of essential oils from the identified plant material, is an indirect steam still, with boiler and condenser. Specifically, the distillation of the aromatic gums and resins requires vacuum steam distillation using a still fitted with pressure valves and stir mechanism. These stills can be purchased second hand from within the Eastern African region, or constructed in a well equipped and capacitated workshop, i.e for stainless steel welding equipment and expertise) through the engagement of a specialist technician.

**Product flow**

*Harvesting fresh material – in dedicated sacks and carried in to the depot centres*

▼

*Depot centre – graded, weighed. (i) distilled using mobile still, producer paid. Transferred to CPC (ii) dried and materials transported to CPC for export to whole top grade markets or for distillation*

▼

*Central producing centre – Filtering, transferring to epoxy-resin lined containers. Bulking and storage (i) sold to other enterprises (ii) sold to other enterprises (iii) exported*

▼

*Market – (i) commercial partner collects from central processing centre. (ii) retail packing and distribution to retail outlets. Payment through bank account. Income to producers placed in each micro-account*

### 3.2.7 Markets

The final marketing is carried out by national merchants and / or exporters based in Addis Ababa or Nazareth which also includes NGPME. About 15 exporters involved in exporting these products especially gum and myrrh. One of the exporters interviewed, NGPME, has long standing experience in the marketing of Gum Arabic, frankincense and Myrrh and is involved in the buying and selling of these commodities from Borana zone, albeit on a relatively small scale.

*Acacia, Commiphora & Boswellia* can be highlighted as one group of the various plant species grown in the arid and semi-arid areas yielding important world renowned gums that are required on the international market. The trend which has enhanced the growth of gum production and use over the past decade has been the increasing consumption of convenience foods better known as ‘fast’ foods or ‘junk’ foods. As in most other sectors of the additives industry, increasing health consciousness amongst a western consumer class has tended to fuel a demand and growth for thickeners of a natural origin.
Gum Olibanum derived from Boswellia, Gum Myrrh, and Oppoponex from Commiphora and Gum Arabic from Acacia species are the three major gum products produced mainly for the export market and sourced from the Borana and Gujji zones. Apart from their pharmaceutical and aromatic applications, these products have a wide-range of industrial uses in areas such as beverages, sweets, chewing gum, confectioneries and mass produced bakery products, dairy products, gelatins, nut products, puddings and canned vegetables. Typical applications include their uses as:

- thickeners, stabilizers, flavour, fixatives and emulsifying agents in food products;
- adhesive thickeners;
- clarification in beverages;
- release agents for rubber products;
- formulations in cosmetics;

National markets: Some of the gum and incense resources of Ethiopia have strong cultural associations and are highly valued for their sacred and ceremonial uses in many different faiths. It is widely used in its unprocessed form for fragrances in many religious rituals. The use of these incense is present in Orthodox, Roman Catholic and Muslim religions. It is used in smoking houses and particularly during coffee ceremonies. Within the indigenous knowledge of the Borana, the acacia species are sometimes used as 'famine food' and given to children in times of drought and food insecurity. Commiphora species are used as traditional soap. The price for a small 200 gm packet of incense gum is sold for between EB2-5 in regional towns in Negelle within the gum producing region and for slightly more in Addis. It is also used in domestic industries manufacturing pharmaceuticals, liquors, cosmetics, detergents, creams and perfumery, paints, adhesives and dyes. The gum sold in the domestic market is below export quality, reflected in the price.

Sub-Regional: Improved market access is possible through value addition into existing retail outlets diverse products like candles, sweets, candies and delicacies. There needs to a stronger market linkages created throughout the supply chain to ensure that local and regional African enterprise owners are aware of the improved products and the opportunities for the manufacturing of more diversified products. There should consequently follow that there is a greater access to the local and sub-regional markets with, for example, well packaged religious incense and gifts for the tourism sector. There are small amounts of myrrh processed and sent out by small companies to research labs. It is difficult to know the full extent of the domestic market as the figures not collected and a lot of it is being traded in the informal sector.

International markets: There are many strong and traditionally significant markets for the gums and resins from this region, both at the national and international level. Due to its significant long established value for the aromatic gums and resins markets, the demand in the international market for these gums and resins is consistently high and under supplied. Current reports from the international market buyers all state that the major problem in purchasing gums and resins from Ethiopia is the high level of adulteration and inconsistency in supply.

Marketing the main gum and resins species in the region comprise three systems.

(i) NGPME visits the villages and town centres and buys the product from the collector/herders, middle men and private sector buyers at a price that is reviewed every three months. There is no set times within the season for their buying trips and no buying stations have been set up.

(ii) The second system involves concessions, in which individuals who have knowledge and experience in collecting quality gums and the financial capacity to cover the food and transportation costs of the collectors are selected to sign an agreement with the NGPME. The intermediate buyers between pastoralists and the private traders or NGPME make payment based on commitment to sell.

(iii) Mostly around Borana and Gujji zones involves direct buying of different types of gums and resins from pastoralists. There are no formal or informal collectors/harvesters groups.

There are licensed dealers in local markets like Yabello, Negelle and Moyale as well as their agents who collect at central places: Wachile, Adegalchat, Arero, Melkha Guba, Dubluke, Borbor, and other places. The NGPME was in former times the only licensed buyer who had the right to transport these products to external markets. It seems that prior to the liberalization of the market (i.e sole buyer was the government), the prices received were much higher compared to that of today, even though international demand for this product has remained constant and is for certain products expanding. The reason being that price received by the collectors is still the same as it was a decade ago, the supply chain was organized through the government infrastructure.
Pharmaceutical and the flavouring and fragrance industry represent the main international market. Gums and Resins are included in a number of products i.e Colgate Herbal, a global brand, contains myrrh as a major ingredient.

Essential oil production is an example of increased return through value addition, e.g. distilled myrrh oil is worth from USD 5,000/litre upwards on the international market, compared to USD 3.50/kg for the first grade gum. Myrrh is added as a fixative to high quality expensive French perfumes.

China is the biggest single importer of frankincense and myrrh with Ethiopia, Somalia and Kenya providing annual av from 1997-2004 of: Ethiopia 700 tonnes, Somalia 500 tonnes, Kenya 150 tonnes. Total 1,450 tonnes. EU is the next most important market with imports from Ethiopia, Somalia, Kenya providing annual av of: Ethiopia 420 tonnes, Somalia 230 tonnes, Kenya 60 tonnes. Total 710 tonnes

<table>
<thead>
<tr>
<th>Table 4. Range of prices for Gums and Gum resins ( inadequate differentiation between grade)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gum or Gum Resin</strong></td>
</tr>
<tr>
<td>Frankincense</td>
</tr>
<tr>
<td>Grade 1 (First Choice)</td>
</tr>
<tr>
<td>Pea Size</td>
</tr>
<tr>
<td>Siftings</td>
</tr>
<tr>
<td>4th Grade</td>
</tr>
<tr>
<td>5th Grade</td>
</tr>
<tr>
<td>Unspecified</td>
</tr>
<tr>
<td>Frankincense</td>
</tr>
<tr>
<td>Grade 1 (First Choice)</td>
</tr>
<tr>
<td>'Graded'</td>
</tr>
<tr>
<td>Unspecified</td>
</tr>
<tr>
<td>Myrrh</td>
</tr>
<tr>
<td>Grade 1 (First Choice)</td>
</tr>
<tr>
<td>Pea Size</td>
</tr>
<tr>
<td>Siftings</td>
</tr>
<tr>
<td>Unspecified</td>
</tr>
<tr>
<td>Myrrh</td>
</tr>
<tr>
<td>Unspecified</td>
</tr>
<tr>
<td>Oppoponax</td>
</tr>
<tr>
<td>Unspecified</td>
</tr>
</tbody>
</table>

- Kenya is a relatively new entrant into the gums and gum resins market
- These figures were obtained by AGARA in July 2005 as from German importers it is stressed that they are only a guide and ‘quality’ is the main factor. Prices are based on the subjective opinion of the buyer
- Prices seem to have declined in the last ten years even taking into account inflation – In early 1994 top grade Somali frankincense was priced at US$6.00/kg C&F Hamburg. Top grade Eritrea frankincense was approximately US$3.00/kg Clean Somali myrrh was available at US$3.00/kg and Somali Oppoponax was priced at US$3.50/kg (clean) and US$3.00 (natural). Presently the market is reported to be stable.

There is a new market interest from China and Italy for a rarer form of Commiphora Paolii commonly known locally as Argasu. Existing within the indigenous knowledge of the Borana – it has been used for centuries for the removal of ticks from livestock, through being soluble in water. It is a medicinal product that is very acidic in nature and has a strong pungent smell. There is ongoing research to investigate the possibility of it being include as an input into human mosquito and other insect repellents.

Acacia Senegal yields commercial gum arabic, used extensively in pharmaceutical preparations, inks, pottery pigments, water-colors, wax polishes, liquid gum; for fabric manufacture, like giving a luster or sheen to silk and crepe, for thickening colours and mordants in calico printing, in confections and sweetmeats. According to the NGPME, there is an annual plan of collecting 5000-10000 quintals of black incense to meet high demand, thus taking full advantage of the international market opportunity.
3.2.8 Existing value chain map of key actors for gum arabic and aromatic gums and resins

Global
- Global Market USA, Middle East, EU

National
- Urban and Rural Consumers
- Religion Institution
- Tourist

Local
- Urban Traders
- Specialized Tourist Shops

Central market exporters & Processing
- Wholesalers Addis and Nazareth

Wholesaling
- Private Traders
- Natural Gum Processing & Marketing Enterprises

Intermediary
- Cooperatives
- Village merchants

Collecting
- Shopkeepers in villages
- Natural Gum Processing & Marketing Enterprises
- Wild Harvest Collectors
- Private Traders
- Natural Gum Processing & Marketing Enterprises
- Village merchants
- Wild Harvest Collectors

Susan Wren 2009
3.2.9 Summary of the key actors and functions.

Table 5: summary of actors and functions in the Gum Arabica and aromatic gums

<table>
<thead>
<tr>
<th>Actors</th>
<th>Specific name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wild collector</td>
<td>Pastoralist mostly the poor</td>
<td>• Harvest the products</td>
</tr>
<tr>
<td></td>
<td>Hired labourers by traders</td>
<td>• Temporarily store</td>
</tr>
<tr>
<td></td>
<td>Able pastoralist</td>
<td>• Sell to retailers in village towns, cooperatives and/or wholesalers</td>
</tr>
<tr>
<td></td>
<td>Cooperative members</td>
<td></td>
</tr>
<tr>
<td>Intermediary</td>
<td>Shopkeepers in villages</td>
<td>• Buy from collectors in cash and mostly in kind</td>
</tr>
<tr>
<td></td>
<td>Cooperatives</td>
<td>• Store</td>
</tr>
<tr>
<td></td>
<td>village merchants</td>
<td>• Delivery to wholesalers mostly at their warehouses</td>
</tr>
<tr>
<td>Wholesalers</td>
<td>NGPME</td>
<td>• Buy from either from cooperatives, retailers and some time from collectors</td>
</tr>
<tr>
<td></td>
<td>Private Traders</td>
<td>• Transport to their respective warehouses</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• sorting and grading, packing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• pay royalty payment to government</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• transport to central market Addis and Nazarteth)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• sell to exporters and wholesalers</td>
</tr>
<tr>
<td>Central Market</td>
<td>Wholesalers who sell to other retailers in major town</td>
<td>• pay the wholesalers of production areas</td>
</tr>
<tr>
<td>(Addis and Nazarteth.)</td>
<td></td>
<td>• processing, cleaning, sorting, grading and packing</td>
</tr>
<tr>
<td></td>
<td>Exporters</td>
<td>• sell to retailers who re-sell to consumers within the country (frankincense and low grade gums )</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• transportation, loading/unloading,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• pay tax, documentation and export</td>
</tr>
</tbody>
</table>

3.2.10 Constraints and opportunities of gum and resins enterprise development

Constraints:
- The area where the gum and gum resin species grow is remote, rugged with undulating topography. There is a lack of access roads and infrastructural facilities such as residential quarters and transport to the potential production areas. Thus mobilization of a dedicated labour force, the use of equipment and supplies and the collection of the harvested natural gums and gum resins extremely difficult.
- The areas where natural gum and gum bearing species grow are either hot, warm, moist or dry and the evapo-transpiration rate tends to be very high in many instances. Thus, the water requirement for the pastoralist/collectors, particularly for drinking is high. Potable water in these areas is scarce further contributing to the inefficiency of the collectors. Moreover the prevalence of diseases such as malaria, relapsing fever and dysentery, which affect the pastoralists frequently, is common in the areas where the relevant trees occur. These diseases force the collectors to leave the areas because of the absence of health centers and facilities also contributing to the decline in production.
- There is no systematic form of collection or recording system in place. Borana pastoralists are ‘opportunity’ collectors – they tap the gum ‘on site’ while herding cattle. The interference from animals has contributed to the low volume and quality of the production. In many case the collected gums are covered in sand, dust, bark, sticks and other foreign matter. This implied that the naturally oozing gums and gum resins has been in contact with the ground and subsequently stored. As a sticky substance when fresh, collectors need to be given specific training on post harvest handling. Appropriate sacks, ideally polypropylene, are not available to collectors so the fresh resource is stored in a variety of papers and plastics that are not clean. This further degrades the product and reduces the quality. The international markets for gums and resins are for pharmaceutical applications and for flavouring and fragrance. If handled with little regard to hygiene and quality, there is very little potential for these gums and resins to enter these lucrative international markets.
- No hand tools are being used for the tapping or collection – or any equipment. The hand tools - a metal hook - have remained the same in design for centuries. They can be made from local materials and require the skills of blacksmiths or welders. In the instances when the tapping of the tree is done by hand or with inappropriate implements to cause the exudation, damage can occur to the tree that will affect future harvests. Many of the species are very sensitive to natural and human interferences can damage easily.

The most common factors observed causing damage to the trees were windfall, insect attack, termites, fire,
improper tapping and collection, clearing and debranching by local communities and the trampling and browsing by cattle.

- Another factor is the tapping of the tree in an inappropriate season, i.e. tapping during the rainy season that leads to a continuous flow of the resin. This causes the resin to become air dried on the branches and makes the trees susceptible to fire.
- No attempts have been made to domesticate the commercially interesting gum and resin species even though over both borders, in Kenya and Sudan, the resource is being ranched and farmed with modern management methods and irrigation technologies for over 2 decades. It is known that the seeds of at least one species of *Boswellia*, the spp *papyrifera*, can germinate readily, vegetative propagation seems relatively problem free. For *Acacia* species, coppicing is not very successful.
- The inadequate and insufficient research that has been undertaken within the sector from the technical aspects of the collection/harvesting throughout the supply chain to the efficient examination of the most profitable and viable avenues of market access has been the result of a number of factors. Some of the information gaps can be attributed to the prevalent shortage of trained researchers, physical facilities and a government allocation of a budget in the Forestry Research sector as a whole. Lack of reliable data relating to the quantity of the resource balanced against the lack of credibility of the official figures on the volumes traded make it difficult to gain an overview of the sector thus affecting planning for a sustainable future for the resource.

**Opportunities**

- Consistently strong world demand in addition to the traditional incense market in the region. Regional market is strengthening and regional buyers are more apparent in the region over recent years.
- The work conducted in Sudan and Kenya (i.e. Saltlick) with export of gums and resins can provide useful experiences.
- Mapping of the resource is now much easier and more accurate using modern technologies such as GIS and remote sensing technologies.
- Improvement to the sustainability and to the market quality aspects are simple and low cost, i.e. new tapping methods using a very simple tool. Modern hand tools that are very simple in design and can be manufactured locally by blacksmiths and welders. There are local NGOs, local government extension workers in the region that can support the skills development.
- Women empowerment: cleaning, sorting and grading is work traditionally conducted by women.
- Opportunities for product diversification and more income generating activities is also low cost and simple. Other species of gums and resins in these regions have potential for niche markets. Distillation of lower grades for essential oils will enable the utilisation of the whole harvested product.
- Eco-labelling / certification is available and the procedure is straight forward for this product sector.

### 3.3 Assessment for indigenous aloes enterprise development

#### 3.3.1 Overview

Aloes are members of the family Aloeaceae, which is mainly African family of plants. In Borana zone 9 different species are found and additional natural hybrids, which are difficult to identify without flowers. The key problem identified was the economic potential of aloe to improve livelihoods of pastoralists in Borana zone has not been yet realized. For Commercial utilization of this natural resource, identification and mapping of the species with commercial potential should be the first task in developing this sub sector. The second many issues to conduct product development study, which clarify the feasible exploitation and marketing of the resource with giving special focus to the knowledge, technology adoption, financial capability and availability of infrastructure of the area. Value addition and exporting new product may be to complex for pastoralist and pastoralist business institutions and private traders also may not interested to take risk at the start.

#### 3.3.2 Description of the resource

There are approximately 360 taxa species between Africa and the Arabian states. Within Kenya there are a total of 40 Aloe taxa of which 20 are endemic taxa and 18 are recorded as threatened by environmental conditions. There is present threat form international trade. Within the area of interest three distinctly different species were identified being mainly *A. Yavellino*, *A. Turkanensis* and *A. secundeflora* there are undoubtedly
Rangeland Enterprises in the Drylands of Ethiopia

numerous other species suitable for commercial exploitation that would require a skilled identification. No serious identification of aloes species using 1997 IUCN Red List of Threatened Plants.

3.3.3 Collection and production

(i) Wild Collection (Sustainable): The work of harvesting the leaves during and after the main rainy seasons should be coupled with the task of regeneration of the species to ensure sustainability and expansion of the resource. Leaves can be harvested in large quantities from the lower levels first leaving the younger leaves higher up. A rotational system can be developed to ensure that enough time is left to regenerate the crop. This work is particularly suitable opportunity for women to earn an income.

(ii) Domestication: Aloe spp generates through the production of ‘suckers’ - these small plants grow off the side of the ‘mother’ plant. If not transplanted will eventually overwhelm the mother and she will perish. A mother plant produces hundreds of suckers within her lifetime, therefore if the small suckers are transplanted in nearby areas. The resource can therefore expand rapidly and the trade can be sustained when the market demand expands. The crop does not require irrigation, however irrigation will increase speed of plant development and leaf weights. For dryland production, harvest should be conducted during the rainy season when the leaves maximize their gel content. Due to the challenge of the lack of surface water resources in the area, very species of commercial crops can be considered for viable cultivation.

3.3.4 Environmental considerations

The IUCN, CITES parties and international NGOs fully support the development of community propagation and cultivation schemes to take the pressure off wild populations. This is to avoid situations like in Kenya where A. Turkanensis and Scabrifolia require urgent concern as a result of indiscriminate harvesting without any regard to conservation. Kenya has the greatest Aloe diversity amongst East African countries and is one of the largest exporters of aloe products to China.

Even though aloes can survive in the most inhospitable of climates and conditions in many areas where lands are being cleared the species is very much under threat. The critically endangered yet famous A. Harlana grows on sparsely vegetated, limestone slopes. It has been suggested that is some areas aloes populations have expanded as a result of lands being denuded through soil erosion or human clearance. Few specific measures are known to be in place in Africa to protect aloes species or their habitats, apart from the recent regulation and licensing system developed in Kenya for domesticated and exported indigenous aloe materials. The environmental destruction increases when the unofficial market price increases that drives collectors to remove the whole plant rather than collecting just the outside leaves allowing their recovery.

3.3.5 Harvesting

There are two types of harvesting: The first kind is when the whole plant is uprooted to be sold as ornamental plants usually exported to the flower markets in Holland or China. It is very much in demand because a young aloe plant can generate hundreds of suckers within its lifetime. The second type of harvesting is the severance of the leaves for the harvesting of the gel and gum products for the medicinal and cosmetics international markets

When harvesting is undertaken sensitively the lower thicker, older leaves are taken from the plant leaving the younger smaller leaves to continue their growth. If all the leaves are harvested then the stalk is left to start it’s life cycle again and produce more leaves. The leaves are harvested during or straight after the rainy season to gain the maximum gel within the leaves.

3.3.6 Post harvest handling and processing

To improve the market potential over the traditional and very low economically rewarding activity of trade in aloe gum, the fundamental need is to stabilise the aloe extracts is imperative within hours of harvesting the leaves. The leaves should be harvested into a suitable basket to allow draining of the sap away from contact with the juice/gel leave.

Processing Aloin: By placing the leaves at an angle the aloin, the first exudates from the aloe species, can be drained and collected into a container for sale as a commodity. This can be done locally, in a very ‘low tech’ manner, by harvesting the larger lower mature leaves and draining the initial greenish yellow sap that emerges
from under the dermis of the outer leaves into a pit or hygienic receptacle placed in the ground. This substance is then be filtered to achieve clarity and cleanliness, before being graded for quality at a central processing unit. The process of first extraction of the aloin from the leaf also removes the compound that gives aloes its bitterness. Thus the remaining leaf now minus the aloin gum can be further processed into other products. This is most appropriate for drinks like juices and gels as well as facial cosmetics when the extremely bitter taste is often considered unpleasant.

**Processing Gel:** There are two types of gel that can be produced from the leaves:

(i) *Inner leaf gel* contains the clear liquid that is extracted from the inside of the leaf leaving the outer leaf chlorophyll covering. This clear liquid can be used locally in production of soaps and cosmetics by women’s groups or by manufacturing enterprises in Addis.

(ii) *Whole leaf aloe gel* is the liquefied whole leaf containing the outer leaf covering, the inclusion of the chlorophyll make the compound to be a much more volatile substance.

**Processing Crystals.** The inner and outer leaf can be dried and be dried and powdered separately or combined to remove the fluid content to < 5% or to a 1% concentration. What remains is a dried substance that can be dried and powdered in a simple maize mill, and sieved to remove impurities and large matter.

**Aloin Oil or Oil of Aloes.** One of the most valuable of the aloes products – can be produced by solvent extraction thus cannot be done at a village level and is a very low yielding product.

**Infrastructure and equipment** could be developed for each of the following; dried (sap drained) whole leaf, gel extract (immediately stabilised with a suitable preservative, sodium benzoate) and the sap extract. Semi-processing of the plant materials for sale in local and national markets will involve primarily:

**Harvesting:** Food grade plastic baskets with inner mesh basket drying and milling. Modified solar driers can be simply constructed (using thermos with clear drip space below).

**Depot Centres:** Solar drying equipment (solenoid, thermostat, fan, baffles). Roller press, food grade storage drums for separated sap. Food grade plastic storage drums for the separated gel/juice (preservative will be added to stabilise the liquid, i.e sodium benzoate).

Central Processing Centre and equipment costs (excluding installation, fittings, infrastructure) as follows:

a) to process aloe juice - approx USD 250,000
b) to obtain concentrated aloe sap – approx USD 200,000, dependant on volume and selected technology

c) to manufacture bodycare products - approx USD 90,000

For a future investment: d) to manufacture spray dried product - approx USD 200,000 to 500,000

**Product flow**

Sustainable wild harvest or production - Plantation small scale farmer outgrowers  
   ▼

Depot centre – graded, weighed, farmers paid. Aloe semi-processed  
   ▼

Central producing centre – Collection of bulked drums from the depot centres and transportation to CPC.  
   ▼

Market – Buyer transports from the processing centre. Or further processing, distribution and retail sale.

**3.3.7 Markets**

Aloes have been traded historically across the ASAL. It is also interesting to note that even Kenya – the largest African exporter globally and especially to China there is very little trade regulation and no bodies set up to monitor or enhance the trade. In Kenya women have been organised into groups by NGOs like Practical Action mainly as a conservation strategy to preserve the Turkanensis species from degradation and possible eventual

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1 To obtain freeze dried investment of approx USD 1 million to 1.5 million is required.
extinction. Turkana is well endowed with commercial aloe, aloe *turkanensis* and aloe *secundiflora*, which have been found to have compounds similar to those in aloe vera, and have comparable leaf sizes making them good candidates for commercial exploitation. There are 320 members

**Government Agency Channel:** Owing to CITES listings – many governments have banned the harvesting of wild aloes – being signatories of the International Convention on Biological Diversity (ICBD) and encouraged the setting up of plantations and active propagation of the species. Very little is done to enforce the ban and as extracts tend to be small in volume and thus highly concentrated. The monitoring of export documentation from producing countries is arbitrary but data tracking in recipient countries (through looking at CITES data on imports) like China, Saudi Arabia and the USA show fairly large economic volumes of trade coming from East Africa especially Kenya. Consignments are often listed as ‘gum aloes’ to facilitate export approval. Presently, Kenya appears to be the main source of aloe extracts traded internationally from the East African region. Its products: sap, bitters and crystalline jelly for many years have been exported mainly to Pakistan, United Arab Emirates, France, Singapore, Thailand, Italy.

**Private Buyers Channel:** There are many private buyers channels from research institutions in the west, to garden centres (seeds and live plants), pharmaceutical companies to cosmetic and rinks manufacturers (gel). National trade is limited to traditional doctors and manufacturers of soaps & cosmetic

### 3.3.8 Summary of the key actors and function

There is no as actors engaged in harvesting, processing and marketing of aloe in the study area except pilot trial initiated by SOS Sahel Ethiopia project to produce soap as mentioned earlier.

Table 6. The main actors and functions are presented in the list below:

<table>
<thead>
<tr>
<th>Actor</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agro-Pastoralist/ Collector</td>
<td>o  Collect ‘wild’ aloes</td>
</tr>
<tr>
<td></td>
<td>o  Dry and store</td>
</tr>
<tr>
<td></td>
<td>o  Deliver either to local coop, supplier or buyer</td>
</tr>
<tr>
<td>Plantation / Homestead Farmers</td>
<td>o  Manage m far</td>
</tr>
<tr>
<td></td>
<td>o  Supervise transplantation of wild and cultivated plants</td>
</tr>
<tr>
<td></td>
<td>o  Dry and store plants</td>
</tr>
<tr>
<td></td>
<td>o  Harvest fresh plants for sale</td>
</tr>
<tr>
<td>Collector / Local middleman</td>
<td>o  Collect and weigh dried plant products</td>
</tr>
<tr>
<td></td>
<td>o  Pay cash on delivery</td>
</tr>
<tr>
<td></td>
<td>o  Transport to Supplier (fresh and dried)</td>
</tr>
<tr>
<td>Supplier</td>
<td>o  Collect fresh &amp; dried products from farmers/collectors</td>
</tr>
<tr>
<td></td>
<td>o  Pay cash on delivery</td>
</tr>
<tr>
<td></td>
<td>o  Further dry, sort and grade products</td>
</tr>
<tr>
<td></td>
<td>o  Store and/or deliver to exporters</td>
</tr>
<tr>
<td>Local farmers/pastoralists</td>
<td>o  Collect gels and aloin</td>
</tr>
<tr>
<td>Women/community groups</td>
<td>o  Produce simple soaps and other products</td>
</tr>
<tr>
<td></td>
<td>o  Market locally</td>
</tr>
<tr>
<td>Exporter</td>
<td>o  Further process dried leaves</td>
</tr>
<tr>
<td></td>
<td>o  Phyto-sanitary, packaging and other documentation</td>
</tr>
<tr>
<td></td>
<td>o  Sell to specific market</td>
</tr>
</tbody>
</table>
3.3.9 Potential value chain map of key actors for aloe products - No current value chain exists.

*As this is an envisaged structure – adaptations and permutations are to be expected*
### 3.3.10 Potential for different aloe products

<table>
<thead>
<tr>
<th>Aloe-enterprise type</th>
<th>Example plant species</th>
<th>Rational based on environmental and economic considerations</th>
<th>Location of supply</th>
</tr>
</thead>
</table>
| Aloe sap for bitters / aloe gum | Aloe secundefolia Aloe turkanensis ... | • Available indigenous medicinal plant products that are established in the national, regional and international markets  
• Plentiful and diverse in Borana and Guji, and several sub-species can be used  
• Sound commercial potential but readily destroyed through exploitation, supply from domestication rather than wild harvest should be  
• Developing sustainable wild harvest supply will mean the establishment and promotion of sustainable harvesting levels and protocols, and the enforcement through externally (Organic and FSC) and internally driven (ICS) certification and as part of the purchase criteria of the buyer/s.  
• Developing the processing of herbal supplements for the African market is not capital intensive, and effective equipment can be inexpensive to purchase. | To be completed after a detailed botanical study |
| Aloe gel for Bodycare products | Aloe Lateritia / Gramanicola | • African market for bodycare products is immense  
• Demand outstrips current supply for high quality natural ingredients based, well formulated bodycare products  
• Sound commercial potential but readily destroyed through exploitation, supply from domestication rather than wild harvest should be  
• Due to the widely known properties of aloe there is low risk attached to developing range of herbal remedies processed as easy to take supplements and ointment/creams, retailed through local shops/clinics  
• Already successful bodycare product enterprises operating in region  
• Community owned enterprises also exist in region producing aloe based bodycare products for the local market.  
• Majority of ingredients can be sources and processed locally  
• Processing equipment is relatively inexpensive  
• This bio-enterprise type can operate in synergy with other bio-enterprise | To be completed after a detailed botanical study |
| Aloe leaf powder | All sps | • Herbal supplements into established national and regional markets.  
• The quality parameters are easily controlled and met at the processing stage,  
• Equipment is simple and not expensive to purchase/construct | |
| Aloe tea bags | All aloe types | • Processing is also simple and inexpensive.  
• Regional companies can provide a sound commercial partnership | To be completed after a detailed botanical study |
3.3.11 Existing and potential plant based rangeland products enterprise players

Table 7: *Existing Cooperatives in study districts*

<table>
<thead>
<tr>
<th>Name of the cooperative</th>
<th>Location</th>
<th>Number of Member</th>
<th>Years since established</th>
<th>Organization supporting</th>
<th>Facility</th>
<th>Registered</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Woreda Village</td>
<td>F  M   Total</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sochi Gudina</td>
<td>Arero</td>
<td>24 28 52</td>
<td>2008</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Latu Hamphe</td>
<td>Yabello</td>
<td>8 35 43</td>
<td>2008</td>
<td></td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Urgadakara</td>
<td>Yabello</td>
<td>4 22 26</td>
<td>2008</td>
<td>COOPI and SOS Sahel</td>
<td>Store</td>
<td>Yes</td>
</tr>
<tr>
<td>Dadhadha Bulbul</td>
<td>Liben Bulbul</td>
<td>1 29 30</td>
<td>2007</td>
<td>COOPI and SOS Sahel</td>
<td>Store</td>
<td>Yes</td>
</tr>
<tr>
<td>Abiro Gumi</td>
<td>Liben Malka-Guba</td>
<td>5 15 20</td>
<td>2007</td>
<td>COOPI and SOS Sahel</td>
<td>Store</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Source: Cooperative Promotion Office (Borana zone and Liben District)

**Potential Sub-sector Dynamics**

- International and sub-regional market potential
- Local manufacturing of products
- Selling as an input, blender with other established products that have an existing market share.

3.3.12 Constraints and opportunities of aloe enterprise development

**Constraints**

- Sensitization and awareness work will need to be done with the targeted communities to bring to them an awareness of the multiple benefits with regard to human health
- Research needs to be started to ascertain the properties of indigenous aloes species in order to close the information gaps
- Risk: Local industrial processors may need persuasion to risk their capital in a ‘new’ product and buy processed gel or powder in large quantities
- There are no institutionalized marketing channels developed for this product
- No institutional focus of interest in indigenous aloes species as a viable wild resource for the generation of incomes and employment.
- Resource assessment is not adequately known. This should be undertaken to look at the quality of the species and the extent of the potential resource.

**Opportunities**

- The plant is known by the pastoralists and is within their system of indigenous knowledge
- It is a drought resistant crop and can survive during times of drought
- Skills requirement for processing wild harvested aloes is low level and no greater than for beekeeping
- Enrichment planting can be undertaken to enlarge crops to ensure resource sustainability.
- Information materials can be readily compiled to sensitize the local communities on the health benefits and varied usage of the plant, i.e information on the ‘African aloes’ production activities, markets and products manufactured in other African countries for domestic and export destinations
- Technical knowledge exists on the development of the main products and the by-products. This can be prepared as a set of technical operational manuals for the collection/harvesting and processing
- Strong potential domestic and sub-regional market for finished ‘shelf ready’ aloe products. Aloes products are established in regional and external markets and are considered ‘high value’ products
- Market assurance from buyers locally and internationally can be easily gained
- Buyer specifications for finished products are available for pilots and sampling
- Commercial and sustainable volumes for national, regional and international markets can be produced
Improving Pastoral Livelihoods and Natural Resource Management through Enterprise Development of Rangeland Products

3.4 Assessment of bee products enterprise development

3.4.1 Overview and rational for selection
Bee products and especially honey production in Africa has great potential to create tangible livelihoods. A large domestic demand for honey is Kenya is still not being fully met by African honey, with international imports still meeting domestic production shortfalls. In addition, a large international market for residue-free honey opens opportunities for honey producers in Kenya. In February 2002, the world honey market was strongly affected by an EU ban on Chinese honey, following the identification of antibiotics in samples of Chinese honey. Since China was Europe’s largest supplier of honey (107,000 mt. in 2001), this immediately led to a shortage of honey meeting EU criteria, and honey prices increased rapidly. The prevailing market conditions present an ideal opportunity for small producer nations to get a toehold in the market. Unfortunately, however, African honey is almost absent amongst EU honey imports, although large quantities of honey are produced by small-scale beekeepers in Africa.

Although bee and their products have been central to the East African culture from ancient times, it is not a central part of the pastoralist culture. Beekeeping as a business is a recent development in some parts of the ASAL. The use of bee products as food and medicine has long played an important role in the household. Tanzania is ranked the highest exporter in Africa in terms of quality, Ethiopia is first in volume. Ethiopia is licensed under the EU regulations for the importation into EU countries. The development of this sub-sector has been held back by limited investment in terms of human and financial capital, lack of equitable commercial partnerships developed on firm principals and understandings, and a long term and strategically focused development assistance to strengthening the organisation and management aspects (extension, training, financial auditing and monitoring of recording systems etc). Another important point is that most external development directed at bee-keeping/bee-products initiatives are predominantly concerned or entirely focused on honey production from introduced modern and intermediate hives, failing to recognise that over 99.95 of bee products in Africa are still sourced from traditional hives, and that unless one harnesses this deep tradition and assists it with sustainable and improved practices, the speed of developing this sub-sector will be too slow to provide sufficient tangible incentive to communities to securing the ecological welfare of the natural resources that this subsector and many others are so dependant upon.

3.4.2 Description of the resource:
Within the majority of the target region (including the plain, parks and forest reserves) there is wide availability of indigenous trees/plants that serves as bee forage. There are bands of acacia woodland that provide good potential for high grade uniflora honey in parts of Borana and Guji.

3.4.3 Collection
Traditional (log) hive production exists right across the Eastern Africa region and predominating in certain areas where traditional bee keepers have maintained their activities at domestic levels and some at commercial levels. However, in Borana there is very little commercial collection of honey comb.

3.4.4 Environmental Considerations
Traditional beekeepers are aware of sustainability principals based on the practical needs of maintaining the bee colonies (ie not loosing them to his neighbour and not having to walk further to secure a reasonable harvest). However, pastoral communities are not traditional bee-keepers, and there are many examples of exploitative methods of honey collection being conducted by pastoral and agro-pastoral communities across the ASAL.

3.4.5 Traders
Ethiopia, the main honey traders are Beza Mar ltd, Apinec, Century Trading and Tutu Ltd. Beza Mar has just signed a contract for the export of honey and wax (Ethiopia has just gained country listing for export to the EU). Since Ethiopia gained compliance to the EU regulations for the importation of honey, export consignments have been made to the UK at UKP1.50/kg.

Kenya: The main supplier of honey at the national market level is Honey Care, who has a branded range of honey (acacia, highland, blossom and comb) and flavoured honeys (ginger, cinnamon). Honey Care sources from beekeepers in Kenya and Tanzania largely from frame hives that they have sold to the beekeeping groups, and IFAT registered member- International fair Trade association. H-Care exports beeswax to USA.
and is also just starting consignments of honey to the US. The honey has been tested by Cetam in France. Honeycare pays its producers Euros 1.10/kg and exports at Euros 1.80/kg. Baringo honey is sold at roadside at 1.50 – 1.80/kg. Eco Honey, launched through ICIFPE, offers honey from certified organic and ecologically sensitive production of honey from groups ICIFPE Eco-Honey support. Producers receive Euros1.35/kg for organic in-transition, and is currently consolidating consignments for export with Honeycare. There is 220km2 being certified organic, comprising 1,200 producers. There are several small scale company suppliers in Kenya selling in to the East Africa markets.

Tanzania: In Tanzania the main suppliers to the national market and exports have been Rufiji beekeepers and Tabora Beekeepers. Tabora fell bankrupt in 2004-05 and is now being re-formed by Honey Care.

Uganda: In Uganda bee-products commercial activities are being progressed by Integrated Beekeepers Association, Aura, Moyo, Nebbi Honey Beekeepers Association and APIS Technologies, they are developing well in the national market, some exports have been made over recent years.

South Sudan: Organisation Food Enterprises, Maridi and two other bee-products companies in Southern Sudan are currently working to develop organic certified export supply. There are many other smaller companies and associations operating and marketing bee products in the Eastern Africa region, too many to mention by name in this study.

3.4.6 Post harvest handling and processing
The initial requirement for developing consistent supply of bee-products is the correct establishment of the infrastructure. This involves the construction of permanent depot centres to operate in each of the main production areas serving several producer groups (i.e comprising 150-250 producers), necessary for consolidating the supply, primary grading, and payment to the producers/suppliers. Transportation; the consolidated loads are transported to the central processing centre. The central processing centre is where the honey comb is graded processed, stored, packaged & labelled. The facility should be equipped with the following:

**Table grade honey**
- Producers - food grade plastic buckets with lids, smokers (improved), protective clothing
- Depot centre
- Central processing facility
- Food grade plastic storage drums (200 litres)
- Buffered settling tanks
- Centrifuge (or press, although less suitable) and sieves

**Quality wax**
- Water jacketed wax melter
- Wax moulds

Also weigh scales and recording system (preferably computerised). Any bee-products enterprise initiative should encouraging local artisans to make the protective clothing (nets, gloves and coats) and improved smokers. Although hive production is promoted by both the NGO’s and the government, traditional log hives still represent over 90% of the total production of honey comb in Eastern Africa. To improve the sustainable use of traditional hives, the introduction of the queen excluder provides a positive development. However, as women do not participate in traditional honey harvesting the intermediate hive, such as the Kenyan top-bar, should be particularly encouraged to women in the communities.

The diversification of the products (pollen, propolis, royal jelly) is important in terms of maximising the returns from this sub-sector. Developing the apitherapy, as value addition hive products, also promotes to involvement of women.

**Propolis**
- Large capacity bottle which can be tightly closed
- Scale (more sensitive if working with smaller quantities)
- Strainer (special filter paper, several layers of clean cotton cloth or cotton balls)
- Refrigerator or freezer is useful, but not essential.
Improving Pastoral Livelihoods and Natural Resource Management through Enterprise Development of Rangeland Products

- A heat source is necessary to evaporate the solvent but it is better to use a distillation apparatus, vacuum drier or freeze drier (also for royal jelly).

Pollen
- Pollen traps with retaining trays
- A tubular wire mash tumbler with a fan can clean considerable quantities of pollen pellets

Royal jelly
- Queen excluders
- Queen cups
- Transfer needle
- Spoon or suction device to remove royal jelly
- Dark glass vials and a refrigerator
- Centrifugal extractors for royal jelly (for large scale production).

Product flow
Hive - whole honeycomb carried in food-grade plastic dedicated buckets with lids -

Depot centre – graded, weighed, producer paid. Sieving, bulking in food grade plastic drums

Central producing centre – Honey: centrifuge, warming vat, further sieving, storage in food grade plastic drums. Wax: wax melter and sieving, models, storage (insect, damp free, light free room)

Market – commercial partner collects from central processing centre. Payment through bank account. Income to producers placed in each micro-account

The location of the receiving depot must receive ample consideration. The number of suppliers to the depot should be within maximum 2 hours walking distance. Then the potential of beekeepers within the specified radius should be determined. This will in turn affect the size of the depot. Construction criteria and a protocol for design, materials for the construction and the construction itself must be developed for these depots.

Criteria:
- They must be constructed in such a manner that hygiene can be warranted (cement floors tightly closing doors and rodent free walls and roofs.
- The inside temperature must be able to stay cool. It must have a room which can be kept bee (insect) free. Here the grading and weighing must take place.
- The honey of the same grade and blossom source must be kept separate with proper record. Honey for transport to processing centers must be transferred in 200 litre containers (food grade).
- Specific produce (royal jelly, propolis, pollen) must be kept separate.
- The depot must be build along and close to a major through road so the produce can be easily loaded onto motorized vehicle(s) and transported to the nearest processing facility.

The standard processing facility as has been developed in the region will suffice. Important aspects of the planning will be the quantities of honey to be processed in the near future but keeping an open mind about long term expectations. The building must be constructed of brick and cement. It need a proper roof and insulation so the inside temperature is not too hot. This building is also to be constructed along and close to a major connecting road. It must have a storage room, an insect free room for grading and weighing and extracting. Here there must be two or three levels so that the extracted honey can flow down through sieves to end finally in the packing vessel from which retail pots or bulk containers can be filled. It should have a wax store room (other then the honey room) and lastly an office and possibly a retail outlet for honey wax and hone wine (mead).

3.2.7 Markets
In 2006, 164,185 tons were produced in Africa, of which 100,198 tons were produced in Eastern Africa. The main African producers are Ethiopia (41,233 tons), Tanzania (28,678 tons), Kenya (25,000 tons) and Angola (23,767 tons). Regionally based suppliers of honey and other bee products are Honey Care Africa Ltd, the largest packer of honey and beeswax in the East African region, Eco Honey, both based in Kenya. Tanzania

remains the largest exporter of honey and beeswax in Africa, and the quality of the Tanzanian beeswax is valued very highly, achieving 3.75 euros/kg main (C&F 07, compared to supply from China euros 2.60, Argentina, 3.15 and Ethiopia euros 3.20/kg). The average price for honey (crushed) received by producers in East Africa is euros 0.70 to 1.20/kg depending on the season and geographic location. Traders sell honey to the processors at a price range between 1.20 to 1.80 and kg. Processors retail honey at over 3.20/kg, export returns for bulk honey are between euros 1.10 and 1.80/kg depending on quality and organic status. Ethiopia, as for some other countries in Africa (Uganda, Tanzania, Kenya, Zambia) have gained accreditation to the EU for the export of honey and other bee products to EU countries, over the last few years. However, since achieving EU Country listing for the exportation of Bee products to the EU in 2002, there has been very little export made, due to lack of supply and price competitiveness. At the end of 2007 a retail packed (in the jar) consignment of 6 tonnes was shipped to the US by Honey Care, at a higher than national average margin/kg. Further orders have been placed for 2008 harvest. Honey in Kenya is commonly sold at prices well over the average table grade honey in Europe and the US (see below). However, once organic and/or fairtrade certification have been achieved by producers and traders, the additional premiums will bring about export prices that can compete well with national prices.

The EU and US bulk industrial grade honey C&F is on average between 0.70 and 0.90 euros/kg (i.e. Argentinian honey is currently imported to the EU countries at around Euros 0.90/kg and for Chinese honey Euros 0.70/kg). As EU market quality standards are exacting and high, exportation of bulk honey is only possible. Table grade honey av C&F is Euros 0.9-1.20/kg and Euros 1.70-1.80/kg for organic certified up to 2.20/kg for single flora organic fairtrade, (Minimum FLO price Euros 1.30/kg)

The US market is easier to penetrate than the EU market concerning quality standards. It is also possible to export retail packed honey in jar if the customer has given his confidence in the supply (in the current case of Honey Care). Unblended table grade honey (multi to single flora) average C&F is currently between Euros 1.00 -1.40/kg equivalent.

Bulk table grade honey: 0.80 to 2.20 euros/kg dependant on quality and level of specialism or not. Retail packed table grade organic: is averaged at Euros 2.80/kg equivalent.

The current UK price from smaller scale importers for single flora is C&F bulk price Euros 1.50-1.80/kg and multiflora at Euros 1.10-1.20/kg. Organic certified multi and single flora is sold at 1.90- 2.20, the fairtrade price is similar. The top price is for organic and fairtrade certified single flora table honey, at Euros 2.60-2.80/kg. The price of fair-trade honey is laid down in the fair-trade standards for the production and trade of honey (FLO 2004). Producers receive a price for their honey that is based on the quality and nature of their honey. The price consists of a fair-trade minimum price and a fair-trade premium. For organic and fair trade honey, an additional premium is paid.

### Prices of fair-trade honey (US$/kg)

<table>
<thead>
<tr>
<th></th>
<th>Fair-trade minimum FOB price</th>
<th>Fair-trade premium</th>
<th>Total Fair-trade Organic price premium</th>
<th>Total fair-trade organic price</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-grade</td>
<td>1.80</td>
<td>0.15</td>
<td>1.95</td>
<td>1.95</td>
</tr>
<tr>
<td>B-grade</td>
<td>1.65</td>
<td>0.15</td>
<td>1.80</td>
<td>1.80</td>
</tr>
</tbody>
</table>


In Africa unofficial cross border trade prices are reported to range between euros 0.7 – 2.20/kg

Ethiopia: The average sale price at rural level is 5-6 birr/kg (Euros 0.60/kg) for crushed honey. Co-operatives now receive 11 birr (Euros1.15) for grade 1 and 12 birr for grade 2 comb-honey. In addition, the operation of such a system allows for the development of bee products to export market requirements, and to certified criteria of relevant international standards such as Organic, FLO. 115,000 kg sold over the three years to national buyers as table grade honey: It is the 5th largest world exporter of bees-wax but the leading exporter in Africa. Exports of bees-wax during 02 was 255,000 Kgs

Tanzania: Average price for honey (crushed) received by producers is euros 0.70 to 1.20/kg depending on the season and geographic location. Traders sell honey to the processors on average between 1.20 to 1.80/kg. Processors commonly retail honey at over 3.20/kg. Export in 2005-06 was at 1.10/kg.
Kenya: HoneyCare Africa Ltd is the largest packer of honey and beeswax in the East African region, based in Kenya and operating in Tanzania and Kenya. They are IFAT registered member- International fair Trade association. HC now exports honey and beeswax to USA. Honeycare pays producers Euros 0.90 - 1.10/kg for crushed honey and exports the purified honey at Euros 1.80/kg. Baringo honey is sold at roadside at 1.50 – 1.80/kg. ICIPE Eco-Honey, pay producers Euros 1.35/kg for organic in-transition. Currently consolidating consignments for export with Honeycare. From early 2008, 220km2 and 1000 producers in Mwingi will be fully certified organic for bee products collection.

Saudi Arabia: The Saudi Arabian market comes out as the most promising in the middle east Imports over 5,000 tonnes/year. US suppliers receive Euros 1.90-2.20/kg C&F Retail-packed honey is charged a 12-percent import duty. Honey destined for industrial use is normally exempt from any duty, but the importer must obtain a waiver from Customs. Labelling that indicates the product name, origin, weight, production and expiry dates and the importer and exporter, hygienic regulations.

Kuweit: Similar, market size 1,200 t/year (recorded). A similar market dynamic to Saudi Arabia presides.

The Gulf States: The Middle East imports over 90% of its food (US$9 billion). Honey and wax is imported mainly from Yeman (highly prized), Argentina and the US. Import process range from Euros 1.70 to 3.10/kg. Ethiopian honey may already unofficially enter via Yeman).

World trade in beeswax has increased far more steadily than honey. In trade, there are two categories of beeswax: crude and refined beeswax. The industry uses refined beeswax for its applications. Around 60 % of the imported beeswax is crude and needs to be refined first. 71% of the beeswax imported by the EU countries comes from countries outside the European Union. China is by far the largest supplier to the European Union accounting for 71% of all beeswax imports from outside the European Union.

3.2.8 Summary of the key actors and functions.
Honey traders: There are seven major processors in Ethiopia, as listed below. Their processing facilities range in size and sophistication. Most of these processors are both the crude wax collectors and suppliers. Key processing and companies in Addis include the following3.

<table>
<thead>
<tr>
<th>Processing/marketing Company</th>
<th>Estimated Market of Processed and Packed Honey in Addis (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tutu Mar</td>
<td>30%</td>
</tr>
<tr>
<td>Beza Mar</td>
<td>25%</td>
</tr>
<tr>
<td>Yeshi-Maskal Flowers</td>
<td>20%</td>
</tr>
<tr>
<td>Kidist</td>
<td>15%</td>
</tr>
<tr>
<td>Senho</td>
<td>5%</td>
</tr>
<tr>
<td>AMAR</td>
<td>2%</td>
</tr>
<tr>
<td>Imported (Greece and UAE)</td>
<td>3%</td>
</tr>
</tbody>
</table>

Apinec Agro-industry Company has benefited from a Development Aid Fund Programme-PSOM, that grants part of the investment cost for joint ventures between Dutch and local companies in one part and from a local in the form of commercial credit. The company is also a supplier of a training programme for individual and institutional bee-keepers.

Wax traders: Ethiopia is the eight largest bees-wax exporting country in the world. The major beeswax traders are located in Addis Ababa, i.e : Amoli Pvt. Co., Bashawi Trading, Ethiopian Commodities PLC, Ghion Industrial and Commercial PLC, Legesse Sherifa Pvt. Ltd., Omer and Awad Boabed PLC, Semachew Kebede, Yahia Sayed Omer

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3 Based on a recent market survey by a local private company dealing in honey.
3.2.9 Value chain map of key actors in other regions of Ethiopia

Area I: Quality Improvement in rural areas
Area II: Processing Equipment
Area III: Promotion of non-honey products
Area IV: Development of organic lines

Improving Pastoral Livelihoods and Natural Resource Management through Enterprise Development of Rangeland Products
3.3. Other potential rangeland product enterprises suited to the target region

3.1.3 Ethnobotanicals
WHO estimate that in Africa, up to 80% of the population uses traditional medicine for primary health care. Traditional medicine remains the main means of treatment for the vast majority of people in the HECA, and most particularly for the pastoralist communities in and around the ASAL. However, regional market potential across the continent has not been fully tapped, processing plant materials into a retailable form has been taken to the limits in first world economies but significantly under developed in the wider reached of the African market. Increasing demand for existing ranges of retail packed herbal medicines sold in clinics and main centres, has lead to a rapid expansion of clinics specialised in selling herbal medicines and supplements. Practitioners in the mainstream hospitals and health clinics also commonly prescribe herbal medicines/treatments, particularly for chronic conditions.

3.1.2 Essential oils – wild harvested
There are a number of potential indigenous essential oils growing in the ASAL that can be feasibly and sustainably wild harvested. For small scale producer groups essential oil production is also ideal compliment to dried herb production – utilising the lower grades from the dried herb operation. For gum and resins operations, essential oil distillation provides an ideal method of utilising the lower grades which will achieve relatively high returns in the form of essential oil in the international market. There is good prospect for the wild harvesting of indigenous essential oil plants such as the occimum spp and lippia spp, found all over the region, and tagette minutes and lelechwa, growing abundantly in the group ranch areas. The indigenous essential oils can be sold into the national and regional buyers for the manufacturing of healthcare or bodycare products – or to other such pastoral/rural enterprises should these be developed. Certification of the production and processing facility will be necessary for competing in international markets. This can be achieved within a year in these undisturbed landscapes.

3.1.3 Bodycare products
The African market for bodycare products is immense, being a fundamental part of the culture and traditional practices. The national and regional demand for high quality natural ingredients based, well formulated bodycare products is increasing apace. Natural bodycare products, which include ethno-botanical plant ingredients, essential oils, and other cultivated plant materials, as well as having strong national and regional market demand/potential, are now recorded as part of the fastest growing sector in the international organic market place. The cross spectrum of indigenous African oils products contain chemical compositions that can be applied to a diverse range of dermatological and cosmeceutical preparations. Unrefined fixed oils such as the African tree seed oils also contain 0.1-3% lecithins, including phospholipids, and small amounts of waxes, sterols and other hydrocarbons such as carotenoids, tocopherols and tocotrienols. These can further contribute to therapeutic activity, which lead to suggest that a lot more investigative work needs to be conducted within Africa on the unsaponifiable part of these unique African oils as well as the multitude of other indigenous plant derivatives.

4. Certification - Non Physical Value Addition
Certification provides non-physical value addition, and serves more purposes than control of compliance alone. The certificate communicates to the consumer that certain standards have been met in the production and provides buyer confidence in the supply chain. Certification therefore is a useful tool in building partnerships along complex and international supply chains. The assessment of sustainability threshold for wild harvested plant products, according to certification protocols, and the organisation and structuring of the producer groups and the education of the wild harvesters as to the criteria of a sustainable commercial operation, is a core criterion.

4.1 Organic:
Certification provide transparency and traceability, therefore all parts of the chain, from the small producer to the consumer must be recorded and operated to international approved certification standards. Organic certificate relates to the land on which the product is grown or harvested and the system involved. For small scale producers to be economically certified an internal control system must be developed and managed, as mentioned below. Organic certification provides non-physical value addition, and certificate communicates to the consumer that certain standards have been met in the production and provides buyer confidence in the
supply chain. Certification therefore is a useful tool in building partnerships along complex international supply chains. The assessment of sustainability threshold for wild harvested plant products, according to certification protocols, and the organisation and structuring of the producer groups and education of harvesters as to criteria of a sustainable commercial operation is a core criterion.

Exporters should confirm with their customers that the necessary registrations are in place before shipment takes place. The administration and enforcement of organic standards are carried out by national authorities. Consolidated version of the Regulation is found at www.organicts.com/organic_info/certification/links/index. In the United States, the National Organic Program (NOP) came into effect in October 2002, it is administered by the US Department of Agriculture. More detailed information on the NOP is available at the USDA NOP web site www.ams.usda.gov/nop. Organic regulations for plant based products took effect in Japan in 2001 Organic products must carry the mark of the Japanese Agricultural Standard (JAS).

4.2 Fair trade:
In the international market, fair-trade is an identified sector and products labels fair-trade often receive price premiums and, in general, higher demand. The fair trade initiatives try to provide better market access and better trading conditions to small farmers. This includes a price premium for producers to be invested in social and environmental improvements. The Fairtrade Labelling Organisation (FLO) is becoming the most well known, marketed and promoted international fair-trade label in the global market. FLO mainly catering for food product labelling. Fair-trade certification involves the training of the participating companies and producer associations, the lead farms in the communities and field staff.

4.3 Wild Harvest Standards.
The development of sustainable wild harvest standards is imperative where products are sourced from indigenous resources. Sustainable wild harvest standards are devised to ensure that wild production comes from a clearly defined area and using methods that meet international standards criteria. Over the last 12 months, the ISSC-MAP has evolved into an international standard and regulatory body, FairWild. The FairWild Foundation provides a certification system and standard for socially and ecologically positive collection and production of indigenous plants. The approach builds from two standards developed in recent years, the International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants and the FairWild Standard

The table below illustrates the primary positive and negative impacts that each of the proposed bio-enterprises could have on the environment of the ASALs.

<table>
<thead>
<tr>
<th>Example rangeland product enterprise</th>
<th>Negative Impact</th>
<th>Positive impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gums and resins</td>
<td>Unsustainable harvesting</td>
<td>Strong potential for sustainable non livestock based income generation, also inclusive of both gender.</td>
</tr>
<tr>
<td>Bee products</td>
<td>Unsustainable harvesting does take place. Unsustainable use of wood to make the log hives</td>
<td>As above. Training provided and certification (using the ICS) in place to provide incentive driven community policing of the sustainability of harvesting.</td>
</tr>
<tr>
<td>Fresh and dried fruit and vegetables</td>
<td>Encourage more land to be cultivated for the production of these crops</td>
<td>Focus commercial activities on small land holdings, thus reducing livelihoods demand on the natural resources. High value crops providing greater return/ha encourage more effective land use and less land cultivation.</td>
</tr>
<tr>
<td>Essential oils</td>
<td>Over harvesting, unsustainable – but very unlikely. For cultivated production it could also encourage more land to be cultivated</td>
<td>Method of curbing the expansion of invasive species. Financial incentive for resident communities to engage in conservation activities. High value crops providing greater return/ha encourage more effective land use.</td>
</tr>
<tr>
<td>Craft</td>
<td>Unsustainable methods of harvesting plant materials</td>
<td>Training provided and certification (using the ICS) in place to provide incentive driven community policing of the sustainable use of natural resources.</td>
</tr>
<tr>
<td>Bio-fuels</td>
<td>Over harvesting, unsustainable – but very unlikely</td>
<td>Method of curbing the expansion of invasive species. Financial incentive for resident communities to engage in conservation activities.</td>
</tr>
</tbody>
</table>
5. Business Assessment of the selected Rangeland Product enterprise types

5.1 Factors influencing ability of rangeland product enterprises to meet business criteria

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Main factors</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Economically sound</strong></td>
<td>Critical Partnerships&lt;br&gt;Competitive advantage&lt;br&gt;Economies of scale&lt;br&gt;Assessing export viability&lt;br&gt;Sustaining the market position&lt;br&gt;Producer / Operator Capacity</td>
<td>• Baseline data collection&lt;br&gt;• Professional input on opportunity assessment (product development, branding, marketing)&lt;br&gt;• Feasibility study and basic business plan&lt;br&gt;• Assessment of the potential for certification&lt;br&gt;• Micro-credit for individual investment in scaling up&lt;br&gt;• Grant and loan support to the producer group/co-operative to develop purchasing and processing capacity, and other trade finance aspects&lt;br&gt;• MOUs between the producer groups/association/co-operatives and the development, research, government and commercial partners</td>
</tr>
<tr>
<td><strong>Economic advancement of women</strong></td>
<td>Micro-credit and savings facility&lt;br&gt;On-going trials and extension services&lt;br&gt;Organisation and business training&lt;br&gt;Sensitisation of communities to the role of women in business&lt;br&gt;Sustainable wild harvesting business opportunities&lt;br&gt;Value addition involving processing of raw materials&lt;br&gt;Organised trading associations</td>
<td>• Should be proactively promoted and encouraged at the community level as well as being endorsed as part of the commercial business approach.&lt;br&gt;• Developing the constitution and bylaws of the producer groups working with the enterprises&lt;br&gt;• Training in improved techniques that are appropriate for women participation and adequate to achieve the quality expected in target markets.&lt;br&gt;• Women retain their incomes for their efforts through small accounts where sale can be directly placed.</td>
</tr>
<tr>
<td><strong>Pro-poor</strong></td>
<td>Micro-credit and savings facility&lt;br&gt;On-going training and extension services&lt;br&gt;Organisation and business training&lt;br&gt;Organised trading associations inclusive of all sections of pastoral society&lt;br&gt;High value cropping that can be grown on small land sizes&lt;br&gt;Sustainable wild harvesting business opportunities. Value addition involving processing raw material</td>
<td>• Micro-credit and savings facility&lt;br&gt;• Training of producer groups in technical, management and financial aspects&lt;br&gt;• Management &amp; organisational capacity building&lt;br&gt;• Sustainable wild harvest protocols and regulation thru agreement based on compliance to these protocols&lt;br&gt;• Construction of the depot and processing centres&lt;br&gt;• developing demonstration sites&lt;br&gt;• Trade finance and capital to develop the business</td>
</tr>
<tr>
<td><strong>Relevant to the disaster risk profile in the region.</strong></td>
<td>Based on thorough baseline evaluation and feasibility studies&lt;br&gt;Responsive to climatic changes&lt;br&gt;Suitable for transient populations&lt;br&gt;Enhances ability of pastoralists to manage disaster / buffer the effects&lt;br&gt;Opportunities for the de-stocking in exchange for preserved foods&lt;br&gt;Processing for long shelf life</td>
<td>• Feasibility study and basic business plan&lt;br&gt;• Pilot phase to develop the approach and refine the partnerships and business plans&lt;br&gt;• Develop the training and extension facility with the development, research and commercial partners&lt;br&gt;• Provision of depot centres and equipment.&lt;br&gt;• Training and assistance in processing&lt;br&gt;• Training and assistance in business management&lt;br&gt;• Assisting groups with linkages to market</td>
</tr>
</tbody>
</table>

5.2 Example basic business summary of selected plant based rangeland products enterprises.

Please see Annex 2.
5.3 Service providers that address the constraints and the opportunities

5.3.1 Identified service providers
The following service providers indicated in the table 4 here under were identified as existing and potential service providers for the selected sub sectors to address the constraints and opportunities mentioned in this report. Constraints and opportunities to services provision are included in the below.

Table 10: Existing Potential service providers, and Constraints and Opportunities in the Market for Services

<table>
<thead>
<tr>
<th>Service Market Information</th>
<th>Constraints and Opportunities in the Market for Services</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Existing and potential Service Providers</strong></td>
<td><strong>Demand-side</strong></td>
</tr>
<tr>
<td>Pastoralist Development Offices (PDO) of the government (Zone and woreda)</td>
<td>1. Pastoralist do not feel comfortable taking the service because of irregular and unpredictable nature of service delivery</td>
</tr>
<tr>
<td>Financial institution (Oromia international and commercial Bank)</td>
<td>2. Unavailability of services in many locations of the target area like micro credit provider</td>
</tr>
<tr>
<td>Gum and gum resin marketing cooperatives</td>
<td>3. The demand for some service is less due to lack of awareness</td>
</tr>
<tr>
<td>Saving and credit cooperatives</td>
<td>4. Demand for a quality and affordable animal health care service is high</td>
</tr>
<tr>
<td>Indigenous institution Vendors for gums and resin traders</td>
<td>5. Services in many locations of the target area has been found to be very limited and of poor quality.</td>
</tr>
<tr>
<td>NGOs</td>
<td>6. The demand for financial service is high for organized cooperatives and less for individuals pastoralist</td>
</tr>
<tr>
<td>7. The poor pastoralist do not use some of the services like saving due subsistence living condition prevails in the areas and the well-to do lack exposure using the service</td>
<td>• Suppliers misunderstanding benefits of marketing</td>
</tr>
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<td></td>
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</tbody>
</table>

5.3.2 Financial providers
Financial institutions exist in the target area are only two commercial Banks one private and one government namely Commercial Bank of Ethiopia and Oromia International Bank. Micro finance institutions which are know in other part of the region as well as the country in providing small and micro credit to individual and cooperatives totally missing. Total absence of such credit institutions has forced NGOs assisting the cooperative initiatives in the area to provide seed many rather than facilitate access to credit for pastoralist community as well as their business firms.

Although there is a huge demand for credit especially in organized cooperatives the existing service provider commercial banks are reluctant due to many reasons, to cite as example very high cost to process small loans, the client inability to fulfil the stringent collateral requirements, low saving culture, liquidity of the bank, past bad credit history of CBE (sick loans) etc. These constraints are likely to pose even a greater impediment especially when it comes to scaling up the natural product collection, milk production and sales in commercial terms in the areas. The lack of financial institutions has not only made the market volatile and uncertain but has also de-motivated the cooperatives pastoralists in taking up their viable business.

These services would primarily include:

- Providing credit to business community including cooperatives and pastoralist.
- Undertaking business feasibility study, ensuring the viability of projects submitted by customers.
- Assisting the community to adapt modern business practices.

Encourage savings and enhancing the culture of saving.

Susan Wren Sept 09
6. Conclusions

6.1 Existing Rural / Pastoral Enterprise Activity
There are a number of existing commercial and development instigated initiatives in the region that have been established with the central objective of improving rural and pastoral livelihoods and providing tangible incentives for communities to conserve the natural environment. These are diverse in their background as well as their business dynamic, some are particularly well inspired and successful initiatives, others have failed. Most are relatively small scale operations with low levels of investment. In general, the achievements of the well designed and managed community group enterprises demonstrate the potential for sound social and environmentally supportive commercial initiatives in these regions and elsewhere.

It is clearly illustrated by the success or otherwise of the existing enterprises that those established and developed by or with the private sector have sustained and are growing (to varying extents). Those that have been set up and developed purely as NGO community projects, unless there has been involvement of a ‘champion’ or active CBOs, have either not progressed or have dwindled - in some cases collapsed, despite the initial level of investment in training and equipment provided the producer groups. The main contributing factors are often well verbalised by the producer group representatives, i.e that they have little understanding of the market, no/limited linkages, low level of business ownership, lack of post-market finance i.e for purchasing the raw materials, to invest in equipment, infrastructure etc, in the first few years of operation.

These factors provide clear indicators for the approach to future livelihoods development, particularly in the ELSE operating areas of the ASAL. In summary, the need for the following is crucial to success: ownership, commercial partnerships developed at the inception stage onwards, on-going training in all technical and business areas, organisational and financial management, third party involvement ensuring traceability and transparency, product design, market awareness and information, value addition technologies suitable for women, progressive business mechanisms based on group involvement, credit facility and micro-banking.

6.2 Presiding Factors Concerning Rangeland Products Development

**African market:** In general, the market is strong. Quality is a major factor and the consistence in supply, as for the international market. There is much scope for value addition of plant based materials for a range of bodycare or healthcare products. Access to packaging materials remains a challenge in Ethiopia

**International market:** The interest in African produced material in this sector is strengthening. Natural products demand is escalating and is now an interracial component of the toiletry, cosmetic, baby product, fragrances, health care products, natural remedies and nutraceuticals markets. The character of the market is evolving towards the ‘feel good product’ which holds ‘natural’ ‘organic’ fair-trade’ as positive endorsements. Product branding of ‘fair-trade’ does have a growing market advantage. The market is specific about product type, and it is vital to obtain the right planting material and quality specifications before embarking on commercial bio-enterprise. The correct packaging for the product is also important and this information, as for the quality specifications & advice on sourcing genetic material, must be sought from the potential buyer. Lack of foreign currency and poor exchange, however, are major constraints to developing supply to export markets. Shortage of appropriate equipment, and difficulty in importing equipment is also presents a challenge

**Wild harvested products:** On order to fulfil the requirements of the importing countries and expectations of the buyers (responding to consumers demands), all wild harvested products need to have third party verification of sustainability of wild harvest at their source of origin. Recognised certification is necessary.

**Domestication of indigenous species:** For scaling up bio-enterprises based on wild harvested plant products, the domestication of these indigenous species should be encouraged where possible. This is particularly important for species that cannot be readily wild harvested at sustainable levels. This will need to be explored further if ethnobotanicals are considered for commercial development. Commercial domestication (plantations) of Acacia Senegal is a viable proposition as it is relative fast growing, however, the majority of the fragrance gums and resins are slow growing, require domestication and therefore the development of commercial plantations will most probably need to be externally assisted (using a method of financial incentives, such as through support of carbon credit schemes).
Value addition: Common to all of the above is the need for depot/collection centres or satellite workshops, and an adequate and efficiently operated central processing facility for final processing, packaging and distribution of the bio-products. A central facility will also be required to enable consistent product quality (grading), formulation, design, packaging and presentation to be achieved.

6.3 General requirements for the development of strong, sustainable pastoral enterprises

Business fundaments: To develop successful rural enterprises and improve livelihoods, even in difficult circumstances, all efforts and operations must work within normal commercial dynamics and address the basic fundamentals. It is therefore clear that in order to assist the development of sound and sustainable enterprises it is necessary to fully address the following:

- Competitive advantage
- Economies of Scale
- Ability to meet market forces
- Opportunity cost

These areas are addressed in the recommendations section. The opportunity cost of developing an enterprise in rural regions (particularly within the remotest areas of the region) is relatively high compared to in most developing countries outside of Africa, often the presiding conditions also significantly limits the potential range of livelihood options. In order for a community to invest their time and limited resources into the development of a pastoral enterprise, and for a commercial partner to take on the risk of investing its resources into a high risk operation the opportunity cost has to be sufficiently reduced to a commercially acceptable level. In broad terms, it is evident that without adequate and well targeted external assistance, the investment risk is too high and the cost-benefit not sufficiently attractive to encourage new business activity over and above that of the existing local market and intermittent trade. It can be considered that supporting the opportunity cost of developing rural enterprise is one of the more legitimate uses of donor aid.

The priority opportunity cost areas that require external support (from both government and development agents) may include: on-going extension and training, micro-credit, basic infrastructure and equipment. Additional areas that require longer term third party guidance and support may include: capacity building to ensure full community ownership and accountability, developing ethical commercial partnerships, on-going training in all technical areas, establishing and overseeing traceability and transparency system for certification, developing value addition technologies (suitable for women involvement) that meet market standards, instigating micro-credit and micro-bank systems with finance partners, expanding market access.

6.4 Potential Pastoral Enterprise Options

Those pastoral enterprises and the natural products that have been identified and evaluated in this study that have potential for commercialisation (can feasibly meet these business fundaments) and ethical, equitable trade are outlined below:

- Bee products – traditional and intermediate hive
- Medicinal plants (ethnobotanical heritage centre with living gene bank linked to the Kew millennium living genebank programme, range of health supplements) – sustainable harvest and domestication
- Indigenous materials for body-care products such as cape chestnut seed oil, henna, white or rhassoul clay, ochre for cosmetic dye, aloe extracts, salvadora persica – toothbrush and loofah
- Crafts micro-enterprises, such as paper making, jewellery and
- Indigenous materials for biofuels (initially for use locally i.e the processing centre) such as croton sp, opuntia and other invasive species as high energy charcoal briquettes.
- Useful plant nurseries – rearing and sale of indigenous vegetables and fruit, oil bearing sp, timber and fuel wood – linked to the life skills education programme.

A combination or sustainable natural resource utilisation, such as bee products, gums and resins and crop production requiring low inputs could be ideal components of a livelihoods programme.

Commercial trials will be required in the pilot phase for potential enterprise product types to assess the commercial viability (incl levels of active ingredients) and feasibility for commercial production by pastoral groups. Example: hoodia sp, stevia, wild yam, African potato (hypoxis rooperii), spelanthus and endemic sp of warbergia u/s and prunus africanaus (necessary for assessing the active ingredients variance for export potential, but not necessary for local markets as there is already well established medicinal use).
6.5 Progress through Partnerships
For support agents to coherently and responsibly develop community owned/participated enterprise there must be fully knowledge of what is entailed in setting up and developing the business operations to market quality and statutory compliant standards, and sufficient capacity with which to develop the necessary training and extension support, infrastructure and equipment, trade finance and operating capital. As for many other similar models across the world, this can be achieved through a combination of public and private investment, grants and loans. A collaborative pastoral enterprise development initiative will need to take full regard of the main facets of a business development, be based on strategic partnerships, and carefully designed support activities that are time-framed and budgeted. A full assessment of the resources and commitment of the core parties should be made during a pilot phase, and full funding and implementing partnerships secured, particularly those that can aid the successfully adoption and implementation of the commercial pastoral / rural enterprise activities.

6.7 Developing socio-economically and environmentally supportive livelihoods
Through a partnership approach, a far-reaching livelihoods development programme can harness the research, capacity building and business expertise. Improving traditional livestock enterprises, encouraging and supporting innovative and market lead value-addition so that greater returns are achieved from lower numbers, will enable pastoral society to flourish maintaining its own defined cultural identity at the same time as breaking down outdated social barriers, such as the exclusion of women from income generating activities. Rural, particularly pastoral, livelihoods must be environmentally supportive. Sustainable harvesting protocols need to be developed and must first be in place, together with externally monitored certification systems to ensure that over harvesting and damage to natural resources will not be encouraged from increasing trade in natural plant products. Customary traditions and social conditions limit women's activity in commercial enterprise. Value-addition can provide opportunities for direct participation of women and landless families and can quickly and tangibly provide real incentives to the participation population to maintain the natural environment. Enterprises should be designed to provide low risk and medium to high return for the participating communities and attractive returns within in a relatively short term from inception; they do not require high capital cost to equip and operate, and involve value addition activities that enable greater gender equality in income generating activities. In order to stimulate the development of multiple pastoral enterprises in the ASAL it clearly requires a co-ordinated and facilitative approach, it also requires a commercial component to facilitate marketing and trade, such as; bulking supply to create economies of scale, promotion and securing of commercial partnerships based on ethical trading standards, interacting between the production and processing operations and the buyers in order to ensure correct quality standards and product design is met, marketing lower grades to national outlets, producing promotional materials and internet site, and trade fairs representation, transparent and ethical management and handling the trade financial, sale returns and distribution/transfers to the account of the participating stakeholders.

7. Recommendations

7.1 General Criteria for Developing Economically Sound Pastoral Livelihoods
As ‘agents for development’ it is necessary to acknowledge that livelihoods is business, and that business development is as applicable to the poorest to the most affluent. These areas are brief explained below, with bullet points on the suggested support activities

7.1.1 Competitive Advantage
The main factors of competing in the market are the price and the quality. There is competitive advantage of exporting organic and fairtrade certified products, due to the market demand and under supply of these products. This has particularly relevance to gums and resins, bee products, essential oils and the dried fruit, where the market impact of organic certification is significant. Price premiums range from 40-50% for whole grade gums and resins, 80-300% for organic essential oils and 30-50% for honey. Fairtrade certification (FLO) does provide a minimum process for the products types that FLO covers (such as honey) but not necessarily a price premium; it does however increase market demand and competitive advantage in export markets. For retail finished products for the national and regional markets, well presented and processed /formulated products will compete well even when prices are 20-30% high than other brands of the same product type that are inferior in these specific areas. However, this applies more to the medium and upper
end of the market. The low market bracket price sensitivity is particularly high and well-formulated attractively packaged products will not move if over the price taking threshold⁴. These specific details need to be evaluated carefully before price setting (i.e market research and trialing).

Capitalising on the intrinsic condition of the source of supply (people and environment story, authenticity etc) and marketing the story line also provided competitive advantage and the harvested and processed by rural communities is able to increase living standards and food security from the business returns, etc.

7.1.2 Economies of Scale
In order to enter the marketplace producers need to first identify the initial minimum supply levels. It is then necessary to achieve the economies of scale that maintain the market position / open up greater markets, to ensure equipment is efficiently utilised and down time is minimised, and the overhead, loan servicing and investment requirements of operating a developing business are covered by adequate turnover. This points leads to the need for consolidating the pastoral/rural enterprises under one or several but collective companies that has the capacity to service the overheads and running costs of operate and manage the business, and provide consistent and high level of quality control, product supply, market interaction etc… The need for a business structure, as a fundamental part of a future pastoral enterprise development programme, is covered in the full report.

7.1.3 Ability to Meet Market Forces
To access the viability of exporting products in this sector, and for selection of the most appropriate crop to grow for export, it is necessary to clearly define the following:

a) The market advantage of exporting from Ethiopia etc - such as high labour, high land requirement or difficult to mechanise, suited to the growing conditions.

b) The opportunity cost - is the product well established in the marketplace, what investment in equipment is required to prepare the product to the market standards. Wild harvest, can the raw materials be feasible sourced quantity required by the buyer and to justify the freight overheads.

c) Risk factor over financial return - usually High Risk-High Return. How tolerant is the crop to the growing condition, quality and level of statutory and buyer demanded hygiene and quality standards.

d) Gross margin per hectare for cultivated crops, or financial return to the wild harvesters

These factors have already been carefully considered in the section of the target enterprise types. Each of these product groups (dried fruit, essential oils, herbs and spices, bee products and craft) have the potential for national, regional and export markets. The focus of a development programme should be initially at the local to national market, growing to the regional market once economies of scale are achieved, and only moving to export markets if the price return is sufficiently higher, the national and regional markets are saturates, or there are other tangible economic and environmental spin-offs.

**Partnerships:** Any pastoral/rural enterprise development initiative requires both a developmental approach and a business approach. The combined requirement for capacity, in terms of skills, professional guidance, extension and training, financial assistance, assess to micro-credit etc, as well as strong linkages with commercial partners and the marketplace, signals the need to develop strong partnerships. These partnerships should be bound by MOU/MOA and formed on several levels:

(i) Implementation, (ii) Financial service/micro-credit, (iii) Commercial partnerships

**The fostering of long term trading relationships** is all important, from the large scale to the small scale, to ensure the viability of the enterprise (i.e investment into a crop and the costs recovery over successive seasons; and annual profit made over the variable costs incurred in the season). To succeed as producer groups must be in a position to make at least a basic business plan. Commercial partners provide the most appropriate and effective tools in creating long-term sustainability of these operations. Introducing such partners will need to be made through careful evaluation by the programme and by the potential partner. Visits to and by the company, the drafting of a MOAs (Memorandum of Agreement) and business plans are important initial activities.

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⁴ The mainstream African market is far more price sensitive compared to quality sensitive (to a lesser degree at the apex), as is the reverse in the mainstream EU and US markets, and most accentuated in the Japanese market.
Producer / Operator Capacity: A careful assessment must be made of the organizational and management ability of the producer groups and commercial operator. The majority of the project effort will need to be placed in developing well organised, structured and technically competent groups and then in the relevant technical skills development. This input is not technically demanding, but required significant man-power and time. This represents the opportunity cost for any commercial development. If these opportunity costs are too steep, there is considerable risk for any commercial partner. It is clear that unless development agents and NGO’s provide assistance to these time and labour consuming areas of extension and training, it is almost impossible for most commercial partners to engage with a community based commercial operation. With regard to capital items, the more the commercial partners are expected to invest, the less autonomy the producer groups have and the higher the opportunity cost faced by the commercial partner. The piloting phase will provide the opportunity for grant assistance for capital items, a programme of training and to develop the basic extension requirements; also to set up a micro-finance facility for providing the producers/groups with affordable loans for the expansion of these pilots into fully commercial enterprises. Once the producer capacity is sufficiently increased, the is secure linkage with ethical commercial partners, large and growing number of producers in this Heartland region are then enable to operate efficiently, sustainably and viably to achieve market entry and sustain the business, & for replicable models to emerge.

7.1.4 Addressing the Opportunity Cost
The numerous lessons learnt from existing community based enterprise development efforts underline the point above. Those crucial to commercial success and able to address development goals include: community ownership, commercial partnerships, on-going training in all technical and management areas, organisational and financial assistance, third party involvement in ensuring traceability and transparency is maintained, market awareness and information, value addition technologies that are suitable for women involvement and meet market standards, credit facility and micro-bank accounts. The opportunity cost of developing an enterprise in rural regions of the ASAL is relatively high compared to in most developing countries outside of Africa. The presiding conditions in the ASAL significantly limits the potential range of livelihood options, but also bring additional challenges. In order for a community to invest their time and limited resources into the development of an enterprise, and for a commercial partner to take on the risk of investing its resources into a high risk operation the opportunity cost has to be sufficiently reduced to a commercially acceptable level. Without external development assistance the risk is too high and the cost-benefit not sufficiently attractive to encourage any new business activity over and above the existing local market and intermittent trade. This is the undisputable reason why there is currently very little commercial development in these regions. To justify this point further, for developing a small enterprise in the UK or Europe there are a range of schemes available, providing small business loans, start-up grants, free business and legal advice, tax exemptions and free marketing opportunities. It can be considered that supporting the opportunity cost of developing rural enterprise is one of the more legitimate uses of donor aid. The priority opportunity cost areas that require external support (from both government and development agents) are as follows: on-going extension and training, micro-credit, basic infrastructure and equipment (also certification set up and inspection costs where appropriate).

Extension: Extension facilities will need to be engaged and operating effectively (with sufficient skills and financial capacity), in order to ensure that the training and skills transfer, the level of management and organisational capacity is build to achieve long term commercial success from this investment of private sector and development resources. Serious consideration needs to be made of this one factor that can make or break a commercial small scale producer based operation. The time and resource of these staff should be assessed. Considerable training and advisory support will be required from the programme to the producer groups/co-operatives, and to the government extension service. The majority of effort will need to be placed in developing well organised, structured and technically competent groups/co-operatives, and then in the relevant technical skills development. This input is not technically demanding, but required private/development sector extension resources.

Demonstration and Training: As these are mostly new enterprises for the small scale producers it is a fundamental requirement to have a complete syllabus of training at the various levels; i.e, production and handling of the materials and grading, for the producers and for the co-operative depot centre/central processing centre staff. Demonstration sites can combine with the trial and plant multiplication sites, which would continue as a source of mother-plants for new operations. These should be located accessibly for the producer groups and for year round use.
**Infrastructure:** Common to all of the above is the need for depot/collection centres or satellite workshops, and an adequate and efficiently operated central processing facility for final processing, packaging and distribution of the bio-products. A central facility will allow consistent product quality (grading), formulation, design, packaging and presentation to be achieved.

**Primary Processing and Collection Centres.** The need for the construction and operation of depot centres to serve the participating producer groups within the communities can be justified as a priority requirement for the development of most of the pastoral/rural enterprises. As this can be a shared facility between the enterprises the overheads and running costs will be minimal against income returns from the activities. The centres will be seasonally operated for most enterprise, i.e for the two honey harvesting seasons, for the tree-seed collection season, and where there are craft groups and medicinal plant groups these centres can be developed as full time operated facilities. The depot can be ideal locations for a mobile abattoir operation.

For the raw material products such as the comb honey and tree seeds, the depot centres will serve for collection, grading, payment and primary processing (initial cleaning such as sieving) and bulking. The materials will then be transported weekly to the central processing centre. Where the depot centres serve groups that are operating year round, such as those involved with the crafts and with wild harvested/ domesticated medicinal (herbal supplements) and bodycare plant materials, they can be expanded to provide water, shelter and cooking facilities for these groups, as well as comprising the receiving room, semi-processing room and the store.

**Pastoral Enterprise Central Processing Centre.** A central processing facility enables the enterprises to ensure consistent final grading, high level maintenance of quality and hygiene standards, appropriate packaging and storage conditions, also to consolidate consignments and to enable the individual enterprise to share these overheads. The centre can also act as a commercial income generating entity in itself by providing demonstration, training and an eco-tourism facility. The training and demonstration facility at the Centre will be set up in such a way that visiting communities will be able to view working examples of the techniques and receive information. Experience gaining and practice in using the technologies will be possible through provision of a certain number of working, mentored, internships made available at the Centre each year.

**Physical value addition – equipment:** The processing of these products will involve solar drying, grading, milling, sieving and packing. For the production of retail finished products for the national and regional markets, further processing will carried out for creams/lotions, capsules and pressed powder tablets, ointments, tinctures and infusions. In order to harness the full potential of the natural resources and provide attractive livelihoods for the sustainable utilisation of the natural products in the target areas the following equipment needs to be considered.

**Non-physical value addition – certification.** Organic certification provides competitive advantage and premium price returns in the international marketplace, and also provides a designation to the land for sustainable utilisation. The internal control system provides a strong supply chain structure with risk assumptive compliance criteria for the members. The incentives to comply with the standards are tangible and attractive, being higher prices and strong market participation. For indigenous products, in order to fulfil the requirements of the importing countries and expectations of the buyers (responding to consumers demands), all wild harvested products need to have third party verification of the sustainability of the wild harvest at their source of origin. Recognised certification labels include IMO under the FairWild Label.

**Product and Market Development**

*Formulation and processing quality protocols:* Many of the existing retailed natural products are not competitive with imported aloe products in their effectiveness and attractiveness as a bodycare and healthcare product. Formulations are mostly not well researched, unstable (shortening the shelf life) and not effectively. Professional input with this aspect will be advisable.

*Product branding* is the non-physical value addition to a product that must be professionally and innovatively embraced in order to maximise on market opportunity and competitive advantage. Product branding includes the ‘story line’, the ‘feel good factor’, the image that you are selling with the products.

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Packaging is a major factor of product competition is its customer appeal. Unfortunately the vast majority of natural products retailed in the region are both poorly promoted and poorly packaged. The level of competition presented by imported natural products, attractively presented and pleasant and effective to use, means that this area has to be addressed in order to enter and hold a position in the middle and upper income bracket of the national bodycare – healthcare market. Packaging, promotional and marketing strategies are as fundamental requirements.

Promotional tools: Website, media, product promotion within retail outlets. Attractively packaged and presented product, word of month as an effective high quality well formulated product

Market research: Major brokers and traders publish regular market reports to advise their customers about market trends (supply, demand and price developments) on websites. Relevant international trade fairs provide excellent opportunity to gain an in depth understanding of market trends, met potential buyers, evaluate new product designs, pricing development etc

7.2 Structure of the business and financial management entities for pastoral enterprise
An analysis has been made of viable and feasible options for developing a successful working structure for developing pastoral enterprises are outlined below. The most suitable structure can be readily evaluated from these options; however financial consideration, the involvement and commitment of the ELSE partners and other potential stakeholders are primary factors in determining the approach.

7.2.1 Commercial pastoral trade association
The development of a commercial pastoral trade association could be set up to comprise representatives of all the existing pastoral enterprises across the ASAL, and provide a representative and co-ordinating functions, and operates promotion and marketing roles for the member enterprises. It can promote enterprise options to stimulate formation of new producer groups through publicity materials, demonstrations and training sessions provided by ELSE consortium and its implementing partner NGOs. The trade association would be inexpensive to operate and would need only one full time co-ordinator to arrange and carry out the basic functions. This initiative could have positive synergies with the Ethiopia Pastoral Forum, an aspect that would warrant further investigation. It could also develop important lobby and advocacy roles to address the existing voice poverty amongst the pastoral communities of the ASAL.

7.2.3 Stakeholder owned pastoral enterprise trading and service providing entity
A stakeholder owned pastoral enterprise company or co-operative union could comprise a wide range of shareholders from pastoral communities and associations, existing enterprises, and relevant commercial ranchers and the tourist lodges / ecotourism enterprises in the relevant ASAL regions. The entity could provide a stakeholder owned trading facility for the natural products. A service providing facility could cover areas such as: product promotion, marketing, pre-market finance for seasonal purchases of its shareholders (through organised pre-agreement with the company stakeholders), create economies of scale by consolidating consignments of the enterprises, soliciting funding for training and expert advisory input to product design and development etc, trade fair exhibitions/representation, arrange micro-finance facilities for its small scale members, act as an intermediate buyer for its members, conduct sales and distribute dividends to the stake holding members from premium returns. The entity (company or cooperative union) would need to raise sufficient funding to employ an accountant, and core staff and for its marketing and promotional activities, trade finance and micro-credit facility for its members.

7.2.4 Trust with separate commercial trading and charitable status
In several situations across the world very successful commercial pastoral/rural enterprises have been set up and operated through a Trust structure. The Trust can comprise two independent operating components; a separate commercial trading arm and a charitable status under which a service providing facility can be supported. This provides the opportunity to fund raise, operate grant supported services and facilities to its stakeholders through its NGO charitable status entity, and the full advantage of business and trade through its ownership of a full commercial for profit company. The Trust provides the potential to bring in charitable funding to assist its commercial operations and grant aid to support the provision of services to its small scale producer members through to the larger enterprises.
7.3 Commercial Pilot Projects

7.3.1 Focus
In order to assist the instigation of commercial operations in early course, it is recommended that they are set up as pilot projects with selected producer groups and products to gain a realistic picture of the full opportunities and comparative advantage. The pilot projects, at the same time, providing demonstration sites for other producer groups and, importantly, seed multiplication centres. The pilots can be monitored and evaluated during the remainder of the first three years phase and throughout the second phase (whilst full commercial operations are being developed, based on the data from the first phase). For the pilot projects to operate on commercial grounds and provide exact and reliable data for evaluation and selection for natural products business development, it is necessary that the appropriate facilities and equipment are installed/constructed, and the producer groups, extension staff and operators are sufficiently training and assisted with technical and management advice throughout the pilot period.

7.3.2 Selecting the pilot areas
It is recommended that the pilot period runs over the initial first two years of a livelihoods development initiative. This will provide a timeframe to the establishment of the enterprise, the structuring of the management and trading facility, construction of the necessary infrastructure, developing the training and extension capacity, at the same time as enabling the participation communities to start commercial income generating activities straight away. The pilot phase will give rise to firm data for expanding the business plans and demonstration of the commercial activities to other producer groups and communities. It will also provide tangible evidence of the investment made into a successful and well structured approach to improving social and environmental conditions and meeting millennium goals to potential donors. It will provide a starting point for commercial investors to engage with the producer groups in developing the commercial activities. Certification process can also be instigated during this period and it is likely that certification status will be achieved by the end of the two year phase.

7.4 Designing a Rangeland Products Enterprise Development Initiative

7.4.1 Progress through Partnerships
The program can be designed and implemented with the direct involvement of the target producers and collaborating national and international private and public sector actors. The successful implementation of the program is brought about through its ELSE partnership through linkages with other like minded organisations, plus the implementing organisations (local NGOs and CBOs) and research institutions that add value and bring in different skills, experiences and competences. Information and skills sharing between the parties will be highly encouraged and harnessed. Through its own resources and capacity and through its core partners, this initiative can offer significant expertise and practical experiences in the areas of natural resources management, agriculture, farmer’s organization, value chain development, and institutional building. Public sector institutions should play a supportive role in agricultural extension, business development services, market information, promotion and development, providing technical and management training, facilitate the formation and legal recognition of a marketing entity, facilitate access to credit and other public services, creating enabling legal and policy environment for smallholder market development. The private sector should play a key role both in supply chain and market development. As all commercial activities also have to be environmentally and socially supportive, the structures and systems not only need to ensure efficient and effective running of the operations, but also compliance to the transparency and traceability requirements of international certification standards and of the buyer/market. The assessment of sustainability threshold for wild harvested plant products, according to certification protocols, the organisation and structuring of the producer groups and the education of the wild harvesters as to the criteria of a sustainable commercial operation, will be focal areas.

It is necessary that the correct and appropriate facilities and equipment are installed/constructed, planting materials of the correct genotype are sourced and the producer groups, extension staff and operators are sufficiently training and assisted with technical and management advice throughout the pilot period. Commercial partners should be engaged under transparent and equitable agreements and operational partnerships secured with relevant NGOs and government departments.
Detailed in-situ assessment of the selected product types and detailed feasibility study is made, commercial trials should be conducted for the cultivated/domesticated natural products, and sustainable wild harvesting protocols determined and methodologies developed for the indigenous natural products, to provide basis data to test the viability of the targeted natural products. At the end of the pilot periods, the initial trials information can be built on and adjusted to provide sound data for the drafting of full business plans for the communities and investors to assist the scaling up of the bio-enterprises. On-going training, management assistance and organizational support will need to be provided throughout the pilot period (1-2 years) and afterwards (at least for 5 years) to enable effective building and strengthening of organizational structure of participating community members and sound value chain that maximize economic returns to community groups, product development and marketing.

7.4.2 Business Structure.
The component and driving force of a future bio-enterprise development initiative will require the most consideration. This initiative offers great opportunities for bringing together the interests of the different residents and land/resource users, and could serve to create multiple benefits, such as: better understanding of the presiding land-use and conservation issues amongst the stakeholders, improved respect of the value and fragility of these resources, social cohesion, more stable rural communities, supportive and mutually rewarding relationship between large landowners and the resident rural communities. In order to stimulate the development of multiply rangeland products bio-enterprises it clearly requires a co-ordinated and facilitative approach, it also requires a commercial component to facilitate marketing and trade, such as; bulking supply to create economies of scale, promotion and securing of commercial partnerships based on ethical trading standards, interacting between the production and processing operations and the buyers in order to ensure correct quality standards and product design is met, brokering lower grades to national market outlets, producing promotional materials and internet site, and trade fairs representation, transparent and ethical management and handling the trade financial, sale returns and distribution/transfers to the account of the participating shareholders.

7.5 Summary of Proposed Activity Areas of a Potential Programme
Activity areas within such an initiative must be based on a viable business framework, and address the main principals. Central areas include:

**Extension**
- TOT of development and government technical and management officers and field staff
- Training of the producer groups
- Extension facility with identified and time frames activity plans

**Demonstration and Training**
- Further develop the demonstration sites (combine with the trial and plant multiplication sites, which would continue as a source of mother-plants for new operations). These should be located accessibly for the producer groups and for year round use.

**Infrastructure**
- Depot/collection centres or satellite workshops, and an adequate and efficiently operated central processing facility for final processing, packaging and distribution of the bio-products.
- A central processing facility enables the enterprises to ensure consistent final grading, high level maintenance of quality and hygiene standards, appropriate packaging and storage conditions, also to consolidate consignments and to enable the individual bio-enterprise to share these overheads. The centre can also act as a commercial income generating entity in itself by providing demonstration, training and an eco-tourism facility.

**Physical value addition**
- Training in the techniques and methodologies. Setting of quality protocols (use of ICS system for risk assessment and community participation in assessing counter-measures)
- Sourcing and purchase of the most appropriate and scale of equipment
- Training in the correct use of equipment
- Product design and formulation
Non-physical value addition – certification
• Training all stakeholders and support actors in the establishment and management of the Internal Control Systems (ICS) required for group organic certification.
• Organic certification preparation & development of recording systems under the ICS system
• Mapping and zoning of the indigenous materials for commercialisation and sustainable Wild harvest protocols developed
• Maturing of the ICS to increase fairtrade certification compliance areas
• Support with the first three years of certification fees (i.e 100% in year 1 & 2, then at 50% in year 3).

Strengthen supply chain efficiency:
• Increased access to relevant technologies and market information through training, capacity building and the creation of marketplaces with requisite equipment and internet access.
• Increased ability of smallholder farmers to organise themselves into effective Producer Associations capable of complex marketing and distribution operations.
• Improved access to credit by smallholder farmers through revolving fund mechanisms tied to the natural product enterprises.
• Facilitation of public private sector partnerships
• Develop protocols to achieve market quality throughout the chain and provide training and information literature on these areas
• Clear identification of suitable markets and market niches for the specific product types
• Economies of scale reached through a careful and supported scaling-up process;
• Viable and sustainable sales of the natural products reached and maintained through strong extension support to the producers, and regular market interface by processors and traders

Other (non-commercial but important) development goals
Encouraging High Community Participation
• Trade finance and capital to develop the business and sustaining product supply.
• Training of producer groups in technical, management and financial aspects
• On-going management and organisational capacity building
• Commercial partnerships (with good interaction between parties and MOU/MAO to bind the agreed mode of operation and responsibilities) and linkage to the market.
• Expert assistance with developing demonstration sites, infrastructure and equipment

Promoting Gender Mainstreaming
• Pro-actively promoted and encouraged at the community level as well as being endorsed as part of the commercial business approach.
• Developing the constitution and bylaws of the producer groups working with the bio-enterprises to stipulate the involvement of women in income generating activities.
• Training in harvesting/production and value addition techniques that are appropriate for women participation and adequate to achieve the quality expected in target markets.
• Women retain their incomes for their efforts through small bank accounts where sale returns can be directly placed.
ANNEX SECTION

Annex 1. Action points for the priority plant based rangeland enterprises

**Bee products enterprise**
A meeting of the honey producer groups and interested parties should be held to provide a participatory discussion and decision making process to address the current situation in the ASAL. Considerations can be made to the development of standard table and specialty honey, stingless bee honey and wax in the first phase. In the second phase apitherapy products, such as propolis, royal jelly and pollen can be developed through training and capacity building.

The key areas for the first phase include:
(i) Increasing the supply and the quality of both the honey and wax through the development of well structured supply chain. This will require group organisation, construction and management of depot centres, training and extension support in establishing protocols for handling, processing and storage. An exploratory visit can be organised to take interested group leaders to visit the Mwingi beekeepers co-operative (certified organic and exporting, set up and assisted by ICIPE).
(ii) Organic and fairtrade certification to provide competitive advantage and price premiums in the international market. This will involve the training and facilitating of the producer groups in the Internal Control System (ICS), and financing of the ICS field staff and the annual inspections. Transparency and traceability recording and financial handling will need to be developed throughout the supply chain.
(iii) Focusing on the national market whilst quality parameters and supply are increased and improved, central processing and packaging. Sourcing suitable packaging and labelling materials.
(iv) Developing specialty/uniflora honeys during this phase through assessment of the bee forage and flowering dates, recording systems and separation at the collection points.
(v) Developing stingless bee honey will involve training of the interested groups; this is unlikely to reach retail levels until the second phase.
(vi) Branding the bee products, and marketing the environmental and community enterprise storyline as well as the specialty nature of the products, will require some specialist input during the first year. Producing the website component for this enterprise type.
(vii) Developing commercial partnerships for the export of organic and fairtrade certified table honey (including specialty/uniflora and stingless bee) and wax.
(viii) Establishing the piloting of the apitherapy products (pollen, propolis, royal jelly) with development partners, training of the interested producer groups, purchasing and installing the trial equipment.

**Herbal supplements**
There are no enterprises of this sort currently in Laikipia although there is widespread use of medicinal plants by the resident communities. Sensitization of communities to this enterprise option will need to be made in order to select the most interested and adapted communities and producer groups to work with. The developing a range of herbal supplements will entail:
(i) Selection of the medicinal plant range, based on effective and safe active components for the main targeted diseases and disorders. Efficacy trials
(ii) A botanical assessment of plant populations and establishment of sustainability protocols will then be followed by training of the producer groups.
(iii) In the first phase the groups will collect the plant materials and shade dry them, take them to depot centres (or collection points before these centres are constructed) where the material will be weighed and the harvesters paid.
(iv) The materials will then be processed at the central processing centre and retail packed for distribution back to the rural community clinics and retail outlets. Equipping of the processing centre and training of the processing personnel should take place in the first quarter of the initiative
(v) Regular efficacy trials must be conducted; this service can be provided by research institutes
(vi) Domestication of the medicinal plants will be encouraged and assisted through training and support in setting up the community/producer groups’ medicinal gardens. It is likely that this will take off if the price returns for the dried materials is sufficiently rewarding.
(vii) Once sufficient economies of scale are reached the range of herbal supplements can be marketed at the national level to pharmacies, existing herbal clinics and at health clubs etc…
**Bodycare products**
There are already some groups established and operating to produce bodycare products from aloe extracts. There are two small commercial companies producing and processing raw materials, selling high quality, hand made, retail packed bodycare products to national outlets (lodges, health product and tourist orientated shops in Nairobi, etc). There is currently a low level of community involvement in these operations, and in order to stimulate significant numbers of community members to participate in this enterprise type it will be necessary to take the following steps:

(i) Organise an exploratory visit for the interested groups to meet other producer groups who are successfully processing plant materials and retailing bodycare products.
(ii) Conduct a botanical assessment of plant populations of the indigenous plant materials to be used in the bodycare products, and establish sustainability protocols, and training of the producer groups in the sustainable harvesting techniques.
(iii) Training of the producer groups in the formulation and simple production of small range of bodycare products at the community level (this can be conducted in dedicated rooms in the same site as the depot centres to ease co-ordination, management and extension assistance).
(iv) The producer groups will collect the plant materials and shade-dry them. The products can then be developed at two levels; a) processing at the community level for sale to local market outlets, b) the dried raw materials is sent to the central processing centre, via the depot centres, where the material will be weighed and the harvesters paid. A full range of bodycare products will then be made at the central processing centre for national level market outlets (and in the second phase small export consignments for niche markets).
(v) For processing at the community level, the producer groups will require training and financial assistance to purchase the basic equipment and construct the simple processing rooms.
(vi) Equipping the processing facilities at the central processing centre and training of the processing personnel should take place in the first quarter of the initiative
(vii) There will be need for a purchasing agreement between the enterprises for ingredient materials, i.e between the essential oils and cold pressed oils enterprise and the bodycare products enterprise for inclusion of these materials in the bodycare product formulations.

**Essential oils**
Essential oil production is already in process in part of the ASAL. The operation is simple and required only the supply of the fresh raw materials from the harvester/producers for distillation at the centre or through the use of a mobile still. The essential oils will be primarily for export markets, but also sold to other enterprises for the formulation of bodycare and healthcare products.

The wild harvesting of the proposed essential oil plants (Occimum species, Lippia species, Tarchonanthus camphorates, Tagetes minuta) would be the focus of the first phase and cultivation and domestication in the second phase. To develop this enterprise type in the first phase activities will need to comprise:

(i) Botanical assessment of plant populations of the indigenous plant materials to be used in the bodycare products, and establish sustainability protocols, and training of the producer groups in the sustainable harvesting techniques.
(ii) Preparation for organic certification and first inspection should be made at the earliest point as this will have a big impact on the marketability and price return of the oils in the export market.
(iii) Construction of the essential oil equipment – one mobile still (stainless steel, in-direct steam) with two pots (alembic) of 1000 litres plus boiler, and 2 stills (stainless steel, in-direct steam) - one static open steam still and one vacuum stir still and boiler based at the central processing centre.
(iv) The producer groups will collect the plant materials and the take to the depot centre at a regular pre-arrange day when the mobile still will come to and distil the materials on the same day. Producers will be paid on the fresh weight of the plant materials.
(v) Equipping the processing facilities at the central processing centre and training of the processing personnel should take place in the first quarter of the initiative. The distillation operators will need to be careful training and will be required to strictly abide to the distillation and essential oil handling protocols.
(vi) Gums & resins can be sourced from Arid Lands Resources or other sources, and processed in the static vacuum still at the central processing facility – this may be developed in the second phase.

**Cold pressed oils**
Improving Pastoral Livelihoods and Natural Resource Management through Enterprise Development of Rangeland Products

This can be developed in a similar way as for the indigenous essential oils, above in the first phase. The sustainably wild harvested tree seeds can be collected, weighed and purchased from the harvesters at the depot centres. The bulk supply can be transported at the end of the harvesting season to the central processing centre where stainless steel continuous flow screw presses (x 3-4) will produce the cold pressed oil for purchase by other bio-enterprises (i.e the bodycare and health products) and sold in bulk to agents for high value oils in Eastern Africa and UK/Europe. As for essential oils and bee-products, preparation for organic certification and first inspection should be made at the earliest point as this will have a big impact on the marketability and price return of the oils in the export market.

**Commercial plant nurseries**

Developing community based plant nurseries for medicinal, indigenous vegetables and fruit, oil bearing sp, timber and fuel woods should be a simple process. A small level of training input will be required to assist the producer group/community members to set up and run the nursery and to rear the plants. Mother stock of plant materials with the required genotype / characteristics, this planting materials will need to be sourced and distributed to the groups before the long rains.
### Annex 2. Example basic business summary of selected plant based rangeland products enterprises

<table>
<thead>
<tr>
<th>Plant based rangeland products enterprise</th>
<th>Priority/Time scale (establishment)</th>
<th>Producers</th>
<th>Commercial partners (examples)</th>
<th>Investment (equipment, infrastructure, management, extension etc) Euros approx.</th>
<th>Business development - Euros (timescale &amp; return)</th>
</tr>
</thead>
</table>
| **Locally equipped small scale Aloe factory for:**  
  - Aloe liquid  
  - Aloe bitters  
  - Aloe powder  
  And formulated retail packed aloe products | a) Phase 1  
  b) Phase 2 | Existing groups need evaluation  
  Sensitisation of community leaders/ reps to stimulate new groups | National: Supermarket chains  
  Local market outlets  
  Regionally: Lebanonchem  
  Pure Health  
  Phytomedia  
  Universal Industries/NEL | Example: For all districts and 20 groups  
  Fixed costs:  
  Depot centres: 5 x 5,000  
  Depot equipment: 5 x 2,500  
  Processing centre: 30,000  
  Processing equipment: 70,000  
  Collection vehicle: 6,500 (secondhand)  
  Motor bikes x 4: Approx 9,000  
  Running costs:  
  Extension x 4: Approx 12,000/yr  
  Processing centre staff x 3: Approx 9,000/yr  
  Part time: Approx 2,000/yr  
  Processing unit costs: Approx 3,500/yr  
  Retail packing: (10,000 jars and labels) Approx 1,800.  
  National Bureau of Standards licensing: 4,500 | Av retail pack of 100gm approx Euros 1.5 (1000 packs/tonne)  
  Yr 1: 10 tonnes retail packed = E15,000  
  Yr 2: 15 tonnes retail packed = E22,500  
  Yr 3: 20 tonnes retail packed = E30,000 |
| **International standard/competitive medium scale Aloe factory for:**  
  - Aloe liquid  
  - Aloe bitters  
  - Aloe powder  
  - Aloe gel  
  - Aloe tea bags  
  And formulated retail packed aloe products | b) Phase 2 | Need for well structured bio-enterprise groups, strong extension  
  Increase in level of raw material supply from plantations and sustainable wild harvest – sustainable wild harvesting protocols, and licenced. Organic certification | National: Supermarket chains  
  Local market outlets  
  Regionally: Lebanonchem  
  Pure Health  
  Phytomedia  
  Universal Industries/NEL  
  Internationally: AloeTrade America Universal Industries/NEL | Example: Some districts and 50 groups  
  Fixed costs:  
  Depot centres: 8x 5,000  
  DC equipment: 8 x 2,500  
  Central processing centre: 70,000  
  CPC equipment: approx 300,000  
  Collection vehicles x 2: 16,000  
  Motor bikes x 6: 10,000  
  Running costs:  
  Extension x 6: 18,000/yr  
  Processing centre staff x 6: 18,000/yr  
  Processing unit costs – approx 6,500/yr  
  Packaging materials - approx 3,500  
  Licensing and Certification – 9,500 | Av retail pack of 100gm approx Euros 1.5 (1000 packs/tonne)  
  Bulk export conc. aloe bitters:10 tonnes x 5  
  Bulk export of aloe liquid 20 tonnes x Euros 2/kg  
  Powder 10 t x 3.50  
  **Sub-total: Euros 120,000**  
  Yr 1: 20 tonnes retail packed = E30,000  
  Yr 2: 30 tonnes retail packed = E45,000  
  Yr 3: 50 tonnes retail packed = E70,000 |
| **Herbal supplements (ethnobotanicals)**  
  a) Local market  
  b) National and regional markets | a) Phase 1  
  b) Phase 2 | Second product for some existing NTFP enterprise groups. Sensitisation of community leaders/ reps to stimulate new | a) ICIPE  
  Pure Health  
  b) Universal Industries/NEL | Example: Some districts and 20 groups  
  Fixed costs:  
  CD equipment x 6 – 1,500  
  Central processing centre (extending above) – 4,000  
  CPC equipment – 6,500  
  Collection vehicle and motor bikes x 6 - using above  
  Running costs:  
  Extension x 6 – using the above | Av retail pack of 50gm approx Euros 1.5 (2,000 packs/tonne)  
  Yr 1: 12 tonnes retail packed = 36,000  
  Yr 2: 20 tonnes retail
### Improving Pastoral Livelihoods and Natural Resource Management through Enterprise Development of Rangeland Products

<table>
<thead>
<tr>
<th>Groups</th>
<th>Processing centre staff x 3 – approx 9,000/yr</th>
<th>Part time – Approx 4,000/yr</th>
<th>Processing unit costs – approx 3,500/yr</th>
<th>Packaging materials - approx 1,500</th>
<th>Packaged = 60,500</th>
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<tbody>
<tr>
<td>Bodycare products</td>
<td>a) Local market</td>
<td>a) ICIEPE</td>
<td>Example: Some districts and 20 groups (500 active members)</td>
<td>Fixed costs:</td>
<td>Yr 3: 30 tonnes retail packed = 90,000</td>
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<td>b) National and regional market</td>
<td>Pure Health</td>
<td>Collection depot x 6 - using the above</td>
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<td>a) Phase 1</td>
<td>b) Universal Industries/NEL</td>
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<td>b) Phase 2</td>
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<td>CD equipment x 6 – 1,500</td>
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<td>Central processing centre (extending above) – 4,000</td>
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<td>CPC equipment – 4,500</td>
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<td>Collection vehicle – using the above</td>
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<td>Running costs:</td>
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<td>Extension x 6 – using the above</td>
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<td>Supervisors for village based semi-processing x 4 – 12,000 (by yr 3)</td>
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<td>Processing centre staff x 4 – Approx 12,000</td>
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<td>Processing unit costs – Approx 3,500/yr</td>
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<td>Vehicle running – 2,500</td>
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<td>Packaging materials - approx 2,500</td>
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<td>Av retail pack of 50gm approx Euros 1.5</td>
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<td>(2,000 packs/tonne)</td>
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<td>Yr 1: 12 tonnes retail packed = 36,000</td>
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<td>Yr 2: 20 tonnes retail packed = 60,000</td>
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<td>Yr 3: 30 tonnes retail packed = 90,000</td>
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<td>Bee products</td>
<td>a) Honey</td>
<td>National:</td>
<td>Example: For all districts and 15 groups (1000 farmers)</td>
<td>Fixed costs:</td>
<td>Honey @ euros 1.20/kg</td>
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<td>b) Wax</td>
<td>Supermarket chains</td>
<td>Collection depot x 12 (separately budgeted)</td>
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<td>Wax @ euros 3.80/kg</td>
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<td>c) Apitherapy products</td>
<td>Local market outlets</td>
<td>Central Processing Centre (separately budgeted)</td>
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<td></td>
<td>a) Phase 1</td>
<td>Regional</td>
<td>CD equipment x 12 – 2,500</td>
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<td>b) Phase 1</td>
<td>Ecohoney</td>
<td>CPC equipment – 8,000</td>
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<td>c) Phase 2</td>
<td>Honeycare</td>
<td>Collection vehicle – 6,500 (secondhand)</td>
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<td>Pure Health Products</td>
<td>Motor bikes x 6 – Approx 15,000</td>
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<td>Vicking</td>
<td>Running costs:</td>
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<td>International:</td>
<td>Extension x 6 – Approx 18,000/yr</td>
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<td>Tropical Forest Products</td>
<td>Processing centre staff x 3 – Approx 9,000/yr</td>
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<td>Rowse honey</td>
<td>Part time – Approx 2,000/yr</td>
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<td>Allos/Walter Lang</td>
<td>Processing unit costs – Approx 3,500/yr</td>
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<td>Retail packing for 5 tonnes of honey – (10,000 jars and labels) Approx 1,800. Certification fee – 5,500/yr</td>
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<td>Honey @ euros 1.20/kg</td>
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<td>Wax @ euros 3.80/kg</td>
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<td>Yr 1: 25 tonnes honey</td>
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<td>5 tonnes wax</td>
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<td>= Euros 49,000</td>
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<td>Yr 2: 30 tonnes honey</td>
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<td>8 tonnes wax</td>
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<td>= Euros 98,000</td>
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<td>Yr 3: 50 tonnes honey</td>
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<td>10 tonnes wax</td>
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<td>= Euros 98,000</td>
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<td>Aromatic gums and resins</td>
<td>a) Bulk graded organic sales to export market</td>
<td>National:</td>
<td>Example: Some districts and 20 groups (1500 collectors)</td>
<td>Fixed costs:</td>
<td>Phase 1 Av bulk sales (Euros)</td>
</tr>
<tr>
<td></td>
<td>b) Phase 2</td>
<td>NGPME</td>
<td>Collection depot x 6 (extending the above) – 2,000</td>
<td></td>
<td>Yr 1:</td>
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<td>Regional</td>
<td>CD equipment (driers) x 8 – 15,000 approx</td>
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<td>5 t BC (1.60) = 8,000</td>
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<td>Earthoils</td>
<td>Processing centre (extending the above) – 4,000</td>
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<td>20 t BN (1.10) = 22,000</td>
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<td>Arbor Oils East Africa</td>
<td>Procesing centre equipment – 12,500</td>
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<td>15 t BM (3) = 45000</td>
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<td>Africa Natural Products</td>
<td>Collection vehicle &amp; motor bikes x 6 – using the above</td>
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<td>8 t Mix (0.8) = 6,400</td>
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<td>Lebenchem</td>
<td>Running costs:</td>
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<td>Bulk - Approx 81,400</td>
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<td>International</td>
<td>Extension x 6 – using the above</td>
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<td>Yr 2: Increase by 35%</td>
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<td>Earthblends</td>
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<td>Bulk - Approx 120,000</td>
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<tr>
<td>value added products for national, regional &amp; export markets</td>
<td>Organic Partners Robertet Doens, Netherlands Forestrade, US Robert Badner</td>
<td>Processing centre staff x 3 – approx 9,000/yr Part time – Approx 4,000/yr Processing unit costs – approx 3,500/yr Packaging materials - approx 1,500 Certification fee – 5,500/yr</td>
<td>Yr 3: Increase by 35% Bulk - Approx 180,000 (Plus essential oils of bottom grades – 18,000)</td>
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<tr>
<td>Essential oils</td>
<td>a) Indigenous b) Cultivated</td>
<td>a) Phase 1 b) Phase 2</td>
<td>As above</td>
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<tr>
<td>Example: Some districts and 20 groups</td>
<td>National Abyssinia essential oils Regional Earthenas Phytomedica International: Treattes Earthblends Meadows of Canterbury Robertette Doens, Netherlands Robert Badner</td>
<td>Fixed costs: Collection depot x 4 (extending the above) – 2,000 CD equipment x 4 – 1,500 Central processing centre (extending the above) –6,500 CPC equipment – 12,000 Collection vehicle – 6,000 Motor bikes x 2 – 5,000 Running costs: a) Extension x 6 – using the above Processing centre staff x 3 –9,000/yr. Part time - 4,000 Processing unit costs – Approx 6,500/yr Vehicle running – 2,500. Certification fee – 5,500/yr</td>
<td>Conservative Average euros 50/kg Yr 1: 800 kg (bulk) = 40,000 Yr 2: 1.5 tonnes (bulk) = 75,000 Yr 3: 2 tonnes (bulk) = 100,000 Yr 4: 3 tonnes (bulk) = 150,000</td>
<td></td>
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