



**IGAD CENTRE FOR PASTORAL AREAS AND
LIVESTOCK DEVELOPMENT (ICPALD)**

**REGIONAL INTEGRATION SUPPORT
PROGRAMME
(RISP III)**

**ASSESSMENT OF THE SOCIO ECONOMIC CONTRIBUTION OF
ALTERNATIVE LIVELIHOOD RESOURCES (NON-WOOD FOREST
PRODUCTS AND ARTISANAL MINING) AT NATIONAL LEVEL TO
THE GDP OF IGAD MEMBER STATES**

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The views expressed in this report are, however, those of the author and do not necessarily reflect those of the Intergovernmental Authority on Development (IGAD).

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EXECUTIVE SUMMARY

The use of forests in general and of Non Wood Forest Products (NWFPs) in particular is a very old activity in the human's history. NWFPs across the globe play vital role in providing important community needs for improved rural livelihood; contribute to household food security, nutrition and medicine; help to generate additional employment and income.

The artisanal and small-scale mining activity is also one important source of revenue in rural livelihood. This activity has a large labor absorptive capacity; it can help alleviate rural unemployment challenges and increasing of income of the household.

Within IGAD region, NWFPs and Artisanal mining have tremendous economic potentials for income generation and poverty alleviation at the local level. Where other sources of income are less apparent. These potentials can be realized following from improved institutional arrangements and implementation of supportive policies and legal frameworks, elaboration of venture capital and mentoring schemes, adopting improved technologies and transport infrastructure for processing, value addition and marketing, improved information flows and the capture of green premiums from international markets. Added to this is the positive outlook for the economic viability of NWFPs production and trade, associated with increasing interest in natural ingredients for the treatment of diseases.

Overall, the expectations, from a value-added processing strategy for NWFPs and Artisanal mining in IGAD, should reduce post-harvest losses through better storage, reduction in the weight and volume of raw products through consistent drying, increase standardization using international guidelines, and guarantee consistent quality and acceptability in multiple markets through processing under better hygienic conditions. These may lead to reduction in transportation and handling costs and consequently to competitive sales of products in distant markets.

This research, adapted to local production systems and capacities in IGAD member states, give a review of the situation by analysing the national production, economic contribution to household and national economy, evaluating the export potential and the value chain. It also assess the contribution of the sub-sectors (NWFP & Artisanal Mining) to employment and job creation.

INTRODUCTION

About 80 % of the 5.2 million km² of the IGAD region is Arid and Semi Arid Lands (ASALs) and prone to periodic droughts and chronic desertification. The sub-region is rich in both wild and domestic plant species that have been used as a food for millennia. Like in any other region where the majority of the population derives their livelihood from water and land based occupation, food production and consumption patterns have always depended on the compatibility with the ecological situations of the ecosystems, and recently to the levels of outside influence. Changing ecological situation due to climate change, periodic and persistent drought and/or desertification, has made land incapable of supporting traditional food crops and livestock. The problem is further exacerbated by the introduction of consumption habits both in urban and rural areas where people are increasingly dependent on food that is not grown in their surroundings or in the country. In this respect, urbanization and the food aid programmes have a profound impact in the observed changing consumption patterns of the people of the sub region.

Although livestock remains the principle source of livelihood in the ASALs, the future lies with a combination of livestock and exploitation of products from ASALs. It is time to shift livelihoods beyond livestock. Investing in mapping minerals that can be mined by artisanal miners and sustainably exploitable non-wood forest products (NWFPs) would be good starting points. There is also need to undertake feasibility studies and business plans in order to understand the economic contribution and opportunities, the challenges, the associated costs and benefits appropriate for each ASALs mineral and NWFPs in the IGAD Member states.

The IGAD arid and semi-arid lands are vast grasslands and scrublands that are known habitats of varied endemic plant species and relatives of many domestic cultivars. These weeds, grasses, herbs, trees and shrubs have provided the pastoralists and other inhabitants in the region with honey, feed, fibre, food and medicine since time immemorial. Nevertheless the principle livelihood system for pastoralists remains the livestock keeping which is always at risk due to recurrent climate extremes - droughts and floods. The ASALs have undergone significant transformation over the years mainly due to increasing livestock and human population growth in addition to other phenomena such as desertification and climate change. This has assumed a changing ecological shift leading to loss of habitat and rapid expansion of alien invasive species.

In recent times it has been noted that the ASALs have enormous economic potential and are the home of vital non wood forest products such as resins, gums, honey and other important emerging natural products that are made from indigenous plants and minerals that can be easily mined with simple tools. At international level, the natural products market from such pure and unpolluted sources has risen quite high with bio-enterprises capable of offering new sources of livelihood to the population of the ASALs areas.

It has become evidently clear that natural resources in the region will be protected by the community only if the community derives benefits and improves their livelihoods. The value of traditional knowledge, particularly in relation to medicinal plants is also gaining acceptance and is getting more widely recognised. With support from environmental groups, local communities and indigenous peoples are becoming aware of the value of wild and cultivated plants. Communities know that the economic stakes run high if market chains and value addition is effected in the products that grow wildly around them.

Attitudes towards the ASALs are changing, with new understanding about the value of dry lands environment, the way these environments function, and the way the inhabitants of those dry lands have adapted their livelihoods to the constraints and opportunities that the environment presents.

As a result of the new understanding, there is a growing level of innovation for sustainable dry lands development, particularly in consolidation of successful innovations that are scattered through these sparsely populated and poorly connected regions. At sub-regional level it is possible to draw lessons from such successful innovations and use them to direct new investments and to help create supportive policy and planning that supports ASALs development.

Promoting sustainable land use in the dry lands therefore requires a regional perspective on the challenges that pastoralists face with greater attention on trans-boundary ecosystem management, markets and service provision. To broaden the exploitable resource base for the communities in the ASALs while inculcating values of sustainable use of resources into every day operations, IGAD intends to assess the socio-economic contribution of alternative livelihood resources non-wood forest products (NWFPs) and artisanal mining at the national level to the GDP of IGAD Member States.

1. Objectives of the Assessment

IGAD Center for Pastoral Area and Livestock Development (ICPALD), as specialised institution, is driven by a wide array of initiatives aimed at improving the rural development and livestock production as well as its economic contribution within the region.

The present assignment is supported by one of these initiatives of regional integration and it seeks to assess the socio-economic contribution of alternative livelihood resources in order to contribute to wealth and employment opportunities in IGAD region.

Objectives

The overall objective of this report *“is to provide an assessment and understanding on the current socio-economic contribution of alternative livelihood resources (non-wood forest products and artisanal mining) at national level to the Gross Domestic Product (GDP) of IGAD member states”*.

The main output of this report is developing and promoting eco-(bio) enterprises from non-wood forest products (NWFPs) and artisanal and small-scale mining in the arid and semi-arid lands (ASALs).

The study team made a benchmarking tour to five member states in the IGAD region (Djibouti, Ethiopia, Kenya, Sudan and Uganda) and analysed 3 specific sub-sectors of NWFPs (Gum/Resin, Forest Spices, Honey/Bewax).

The specific objectives of the assignments were:

1. Carry out a situational analysis on how non-wood forest products and artisanal minerals, also considered as alternative livelihood resources are currently computed in the GDP calculation within national income accounting in each IGAD MS.
2. Propose a methodology for internal computation of alternative livelihood resources in GDP including assigning values to the non-marketable services that these resources provide.
3. To suggest and adopt a production approach to estimate the socio-economic contribution of alternative livelihood resources to the GDP of the respective IGAD MS.
4. Review the status of the non-wood forest products (namely gums, resins, spices, honey) and artisanal mining by category and location and their respective contribution to peoples' livelihoods.
5. Review the state of processing technology and marketing situation for both export and local markets of the alternative livelihood resources at national and regional levels.
6. Review the extent of gender, particularly women and youth in the production and marketing of the alternative livelihood resources (non-wood forest products and artisanal mining) at MS level.

Methodology

The methodology applied included the following:

- Literature review to familiarize self with the current member state situation of non-wood forest products and minerals for artisanal mining and marine resources.
- Structured and/or unstructured interviews; field/site visits and consultations with the stakeholders.

- Identification of the socio economic contributions, and design of tools to collect data in the member states.
- Collect data in member countries through the national consultants:
 - (a) Analyse information and data collected through the national consultants to assess the GDP,
 - (b) Generate and calculate the GDP contribution from non wood forest products and artisanal mining in the Member States.

2. Socio-Economic Contribution of GUM and RESIN to GDP in IGAD

Major gums and resins plants growing in IGAD region are two types:

- Gum arabic and frankincense/ gum olibanum. Gum arabic is obtained mainly from *Acacia senegal* but inferior gum type “the gum Talha” is also obtained from *Acacia seyal*. Frankincense is obtained from one species, *Boswellia papyrifera*.
- Myrrh, and Opopanax are products of the genus *Commiphora* species, most of which are indigenous.

Subsequent sections provide a quick situational analysis of **gum and resin sub-sector in IGAD member states countries** with a view at the economic contribution and production potential.

2.1 Situation Analysis in Djibouti

2.1.1 National Production and Economic Contribution

In Djibouti about 50% of the total land area is moist or arid lowlands. These dry lands are endowed with indigenous plant species including ***Acacia and Boswellia*** species, important two plants that produce the commercial gums and gum resins for local market as well as for export.

The genus *Boswellia* and *Acacia* could be found in arid zones with rocky soils. The geographical distribution of these plants in Djibouti is particularly limited to the northern- eastern part of the country around 700 m altitude receiving a mean annual rainfall of 150 – 200 mm. Humidity received from sea is also vital for a good development of the trees.

Boswellia is naturally found on cliffs of the region of Tadjourah (and particularly in the locality of Ruelli and Ribta). The recent introduction of this species in the Region of Arta has been successful.

In Djiboutian informal markets, gum arabic is used for cultural and medicinal purposes. While these species exist in the national territory and could be easily cultivated, most of them are imported from Somalia, Ethiopia or Yemen.

In fact, the local communities have poorly exploited or traded these commodities. At least there is no data showing any records of production, marketing or contribution to the livelihood or national economy. There are no precise estimates showing the extent of the gum producing woodlands, neither any development of production value chain by administrative regions or by species.

This could be explained by the fact that this sector has not received adequate attention in the face of its potential importance and possible contribution to the national income. It is also explained by the marginal role played by the NWFP's, in general, in the Djiboutian rural households.

2.1.2 Challenges and Suggestion to Improve the Sub- Sector

The community members where the resource is grown are poor and willing to participate in resin collection as an income generation activity. This activity could help them to diversify their sources of income and also enable them to generate cash especially during period of drought/ or crop failure.

In some neighbour countries like Ethiopia or Somalia, the contribution of non-wood forest products may really reach a sinificative impact to the annual income of the rural households.

Current international market trend favouring natural products for health reasons has increased

consumption of natural gums and resins, which brings about high demand for resin at local and international markets.

2.2 Situation Analysis in ETHIOPIA

2.2.1 National Production and Economic Contribution to the Household

Ethiopia is known to produce large quantity of gum-resin annually. Due to favourable policies for private sector engagement, the production of gum-resin in the country has increased. Local communities organized into producer cooperatives are also actively engaged to increase the volume of production. A recent review estimates to 2.885,000 ha. the production potential of gum and resin producing species in Ethiopia.

Ethiopia, together with Sudan forms the world's largest producer of Frankincense (Olibanum). Species tapped in Ethiopia for commercial purpose include *Boswellia (B.) papyrifera* widely distributed in northern part of the country; while *B. rivae* is distributed in southern Ethiopia and *B. oogenesis* endemic to Ethiopia, located in Acacia-Commiphora woodland.

Gum and resins produced in the country are traded either on domestic market or for export and is entirely for export market with small quantity used by local industries, while some percentage of the annual production of gum olibanum is domestically used either in religious rituals or for household use for its pleasant odour.

Gum and resin resources represent a considerable amount of the annual cash income of households, the contributions ranging from about 4% in Tanqua Abergele, northern Ethiopia, to about 38% at Beshangul-Gumuz Regional State (BGNRS), northwestern Ethiopia.

Recent study covering all the major gum and resin producing regions in the country ¹, indicated that these resources contributed up to 14% of the average annual cash income of the households in gum and resin growing areas of Ethiopia.

2.2.2 Exports and Economic Contribution to the National Economy

From 1979-2001, Ethiopia had sold 19,523.6 tons of gums and 17,972.5 tons of incense for domestic and export markets respectively. This has added Birr 82,910,753 and Birr 127,416,449 to the national revenue from domestic and export market which summed up a total of **Birr 201,327,202** ².

There is a serious information gap for the local sales data, it is mostly estimated by extrapolating major actor's market share. Since this domestic sales is significant and should not just be ignored, therefore an estimate data obtained from NGPME from 2003–2015 estimate the average volume of domestic sells of gum arabic, within 12 years, to 156 ton.

In addition to their contribution to the local communities and private sector, the gum and resin resources have considerable importance to the national economy and sustainable development of Ethiopia. It's considered as one of the most exported product of the country.

Ethiopia has exported 8,578.2 tons of gum arabic and 49,171.2 tons of other gums and resins within eighteen years from (1997 to 2015). Form this marketing exchange, the country has earned revenue of USD 129,274,054.00. During the same period the import data shows that 1960 tons of gum arabic and 4797 tons of other gums and resins incurred a total cost of USD 7,560,656.00 which resulted in a positive trade balance of USD 121,713,398.00.

Aromatic gums especially olibanum take the major share in the exports. According to (ERCA) data the number of export destinations is to 21 countries for 2014. There are variations between years for the different gums and resins destinations. However, the major importing countries in the past years in terms of value were the UAE, Tunisia, China, Germany, Greece and Guatemala (Onno, 2005). Based on

1 Covering a total of 11 districts from five National Regional States endowed with gum and resin-bearing resources and two cities, which are the main destination of the products for final processing, grading, and marketing (Zenebe *et al.* 2013).

2 source: Girma, 1998; Mohammed *et al.* 2006

the 2014 export performance the bulk of the production is destined among others to China, United Arab Emirates, Tunisia, Greece, Vietnam, India, Jordan, Germany, and USA. The bulk of the traded gum-resin is gum olibanum, principally the Tigray type olibanum.

Table 1: Export and Domestic Trade of Natural Gum (Gum Arabic & Other Gum-Resins) in Volume and Value from 2003 -2014

Year	Gum Arabic				Olibanum and other gum-resins			
	*Domestic		**Export		*Domestic		**Export	
	Quantity (Tons)	Value (000'Birr)	Quantity (Tons)	Value (000'USD)	Quantity (Tons)	Value (000'Birr)	Quantity (Tons)	Value(000' USD)
2003	86	116	381	626	3,694	5,695	2,339	3,520
2004	126	202	234	486	5,118	11,417	2,648	3,643
2005	158	173	111	263	3,981	6,515	3,404	5,001
2006	176	375	317	484	8,347	16,974	3,875	5,665
2007	159	404	956	1,212	6,448	14,401	3,577	5,360
2008	90	269	614	1,292	2,922	9,067	2,861	6,556
2009	353	404	622	1,315	3,512	14,390	2,984	9,223
2010	140	134	909	1,461	2,272	11,572	3,558	12,023
2011	79	111	605	1,272	1,704	8,988	3,446	11,313
2012	86	196	365	573	13,445	47,009	2,740	10,247
2013	142	501	443	670	11,050	50,264	3,269	11,967
2014	280	620	359	529	7,449	49,783	2,612	10,032

Source: Natural Gum Processing and Marketing Enterprise (NGPME). The domestic trade is an estimate summarizing various scattered data (*) and ** is data from (ERCA).

2.2.3 The Value Addition Strategies and Employment

Three broader categories of actors are involved in the gum and resin marketing value chain namely: (i) rural farming and pastoral communities, which could be either individual or cooperative producers or sellers; (ii) cooperatives whose members are town dwellers, mainly, engaged in other businesses, including gum and resin marketing; and (iii) government and private companies were identified.

The value chain of gums and resins is underdeveloped. Inefficient, by weak horizontal and vertical linkage among the actors and poor communication and information dissemination, which coupled with other factors, contributed to low pricing and lack of/ or extended waiting for buyers in some of the localities. Indicated that considering at the value chain starting from local collectors up to export market, the profit to local, national, and international traders are about 22, 33, and 45%, respectively. Through all the chain there was no significant value addition, except for some sort of manual grading of the products.

In Ethiopia, gum and resin resources collection and processing involves thousands of jobs almost throughout the year since, even when their collection is seasonal. The processing and grading activities might remain for longer periods, at least at the main processing stations. For example, the production process particularly of olibanum is one of the top employments generating activity in the remotest parts of the country.

At the national level, the number of seasonal workers engaged in tapping and grading is estimated to range between 20,000 and 30,000 per year³. In addition, it is a very important source of income for most rural people.

2.3 Situation Analysis in KENYA

2.3.1 National Production and Economic Contribution to the Household

In Kenya, Gums and Resins are among key natural resources with potential to improve the livelihoods of rural communities in terms of food security, income generation and foreign exchange earnings. These resources include gum arabic from *Acacia Senegal* (L.). Wild, or *Acacia seyal* and commercial gum resins such as Myrrh from *Commiphora myrrh*, Hagar from *Commiphora holtziana* and Frankincense from *Boswellia neglecta*.

Based on the stocking densities, the potential gum yield of *Acacia senegal* ranges from 50 to 337.5 Kg ha⁻¹, that for *Boswellia neglecta* ranges from 262.5 to 993 Kg ha⁻¹ and *Commiphora holtziana*, 150 to 450 kg ha⁻¹. Based on the estimated area under the resources in the country, the potential for gum arabic production in Kenya is about 10,000 MT while that for resins (myrrh, Oppoponax, frankincense) is about 8,000 MT . However, production of gum arabic has remained low at about 400-500 MT per year⁴.

2.3.2 Exports and Economic Contribution to the National Economy

Most of the gums and resins produced in Kenya are exported in raw form, except for a small quantity of the total volume produced, that is processed for essential oils. There are currently three processors of gum resins in Kenya namely: Vetochem Limited, Northern Gums Limited, Arbor Oils of Africa Ltd.

The firms extract essential oils from myrrh, Olibanum (Frankincense) and Oppoponax (Hagar) through steam distillation process. Vetochem Limited has an efficiency level of 70%. The yield of essential oils at 70% efficiency level is 5% for myrrh and 6% for Olibanum and Hagar. For gum Arabic, it is only Arid Land Resources Limited that carries out value addition to gum arabic by grinding the product and grading it before exporting. Other exporters of gum arabica add value to the product by removing impurities such as the tree bark and then sorting and grading the gum into different grades before selling it to the export market. Packaging is done according to the importers requirements. Powdered gum arabic is packed in 50kgs net weight bags while first grade lumps are packed in 25kgs net wt bags.

Kenya is a major exporter of resins being number three after Ethiopia and Somalia. In 2000 export volumes reached a peak of 1130 MT with a value of about US\$ 2.6million. In 2011, the Export Promotion Council estimated that Kenya exported 96 MT of gum Arabic valued at Kshs. 14.4 Million and 3,299 MT of gum resins valued at Kshs. 340.4 Million mainly to Pakistan, Vietnam, China, Hong Kong and India⁵.

Table 2: Quantity and Value of Gum Arabic Exported from Kenya (2005-2014)

Year	Quantity (M/T)	Value (USD)	% GDP
2004	23.177	12,590.48	
2005	31.844	19,468.67	0.0052
2006	27.700	34,727.27	0.0134
2007	75.354	59,495.83	0.0227
2008	165.170	144,133.67	0.0111
2009	41.168	41,533.48	0.0047
2010	74.606	34674.54	0.0043

3 Source: FAO 1998

4 Source: Muga *et al.*, 2015

5 source: Chikamai and Casadei, 2005

2011	96.308	144,296.31	0.0170
2012	12.300	26,729.44	0.0029
2013	6.500	11,088.98	0.0013
2014	67.335	152,652.12	0.0151
Total	621.462	681390.79	
Mean	56.496.55	61,944.6173	

Source: Center for Business Information, Kenya Export Promotion Council 2015

Table 3: Quantity and Value of Gum Resins Exported from Kenya (2005-2014)

Year	Quantity(MT)	Value (USD'000)	% GDP
2005	1,624	423.947	0.018
2006	1,684	495.874	0.019
2007	2,010	946.653	0.036
2008	2,035	742.611	0.005
2009	2,226	1284.358	0.014
2010	1,672	1073.442	0.013
2011	3,297	3552.63	0.042
2012	3,687	4010.426	0.043
2013	3,014	1294.253	0.015
Total	21,249	13823.926	
Mean	2,361	1535.992	0.02

Source: Muga et al 2015

Table 4: Prices of Different Grades of Gum and Gum Resins at Different Stages Ksh/kg

Distribution Stage	Gum Arabica Grade 1	Hagar	Myrrh	Frankincense
Collector	50	140	190	60
Agent	70	180	300	75
Whole sale	100	200	320	90
FOB	120-150	300	440	140-180

Source:Abdi Somo (2014)Personal Communication

2.3.3 The Value Addition Strategies and Employment

The main actors in the Gum value chain are collectors, informal traders, large scale traders, whole sellers and exporters. The other main actors are the service providers such as service providers e.g. KEFRI, KALRO, KFS, KEPHIS, EPC, KIRDI etc Associations and Networks-GARA and NGARA and over 150 Producer Associations.

This is in addition to the capacity of a number of producer associations that has been enhanced through the construction of stores for gums and resins. Recently KFS through the Miti Mingi Maisha Bora(MMMB) has developed draft regulations under the Forest Act 2015 that aim to develop a subsidiary legislation for the legal and regulatory requirements for sustainable production and marketing of gums and resins.

Major barriers that inhibit realization of full potential of the sub-sector includes: Lack of clear policy

and strategies on the development of gums and resins, poorly developed markets and marketing systems resulting in low prices at the producer level, inadequate access to capital, poor production and post harvest handling practices (limited primary value addition and storage facilities), and land tenure issues. Absence of a regulatory framework in the sub-sector has given prevalence to the growth of few strong curtails controlling the entire value chain, exploiting producers, blocking any new entry, and compromising professional standards. Recently, KFS developed a draft subsidiary legislation for regulating the sustainable harvesting of gums and gum resins.

2.4 Situation Analysis in SUDAN

2.4.1 National Production and Economic Contribution to the Household

Sudan is the world's largest producer of gum arabic. The two most important gum producing species in the Sudan are *Acacia senegal* and *Acacia seyal* and are referred to locally as hashab and talha respectively. The gum (hashab) is a pale to orange –brown solid which breaks with a glassy fracture and the gum (talha) is darker, more friable and is rarely found in lumps in export consignments. Gum hashab is indisputably the premier product but the lower priced gum talha has found recent uses and worldwide appreciation after being considered synonym, by international standards, with *Acacia senegal* which have boosted its value and increased its demand.

In addition to its significant contribution to the whole country, Gum Arabic plays an important role in the rural parts of Sudan, where it provides a steady income to the rural families especially in dry years when crops fail. The supplementary revenues generated by gum arabic are crucial to the livelihoods of up to 6 million people in Sudan who live in traditional rainfed farming areas, where the incidence of poverty is in the range of 65 to 90 percent ⁶.

The major areas of production lies within the rain-fed sector and is mostly produced by small farmers who represents more than 20% and are among the poorest segment of the population. Its production is concentrated in the so called Gum Belt, an area in central Sudan, this is in addition to some areas in east and south east Sudan. The area of production is estimated to cover 520,000 square kilometers nearly one fifth of Sudan total area.

According to IGAD report (2011) about 31% of the local communities in the rural part of Sudan derive their incomes from forest products, with 19% from forest fruits, 13% from gums. Gum Arabic accounts for about 15.3% and 10% of the household income of gum producers and other farmers in the gum belt area respectively. The other interesting observation is that gum and resin commodities constitute a substantial share of the total forest income. Gum Arabic and frankincense production and collection make 3–5 times higher income than the aggregate of other forest products collected by households which are mostly used for subsistence. Another interesting feature of gum and resin-based activities in the rural households' economy is related to the seasonality of production and the timing of the income. Gum arabic and frankincense are available exclusively during the dry season that lasts from 5 to 7 months coinciding with the agricultural slack period.

2.4.2 Exports and Economic Contribution to the National Economy

Gum arabic is one of the four important agricultural export commodities, along with livestock, cotton, and sesame. Over the last 20 years, gum arabic export value amounted on average to \$US 40 million ⁷annually.

All the gum arabic produced in Sudan, mostly hashab is exported. Sudan has always been the largest world producer and exporter of gum. From the 1950s to 1990s, Sudanese gum accounted for 80% of the global gum trade. Since the 1970 drought years, Sudan's gum arabic production has decreased

6 source: World Bank, 2007

7 source: World Bank, 2007

from 45,000 tons in the 1960s through 28,000 in the 1980s to 30,000 presently. However, considerable year to year variations and overall declining gum exports from Sudan due to the droughts, political unrest and inadequate marketing arrangements have resulted in the emergence of new gum producing countries, chiefly Chad and Nigeria, which produce mostly talha type. Over the last 15 years, Sudan's share in the world markets has declined sharply and is now below 50%. During the period 2000 -2014, the exports of gum Arabic from Sudan had fluctuated between about 23,000 tons in 2002 to 32,000 tons in 2007 and down to 18,000 tons in 2010, largely drop due to the drop in production. But recently Sudan has managed to increase the exports to about 60,000 tons in 2013 and 2014 and this was due to increases in production and increase in the international prices. On average, during this period, Sudan had exported an amount of 34,000 tons of Gum Arabic obtaining \$US 61 million.

In Sudan, the contribution of Gum Arabic is calculated within the contribution of the agricultural sector which includes irrigated farming, livestock, fisheries and forestry. Gum Arabic provides an average of 12% of the GDP of the country.

Table5: Contribution of Gum Arabic to the National Economy

Year	Production (000'sTons)	Value from exports (USD, millions)
2009	27.9	33.1
2010	30.2	23.8
2011	NA	NA
2012	30.4	67.10
2013	76.0	134.8
2014	NA	96.98
2015	NA	83.88

2.4.3 The Value Addition Strategies and Employment

Marketing of Gum Arabic in Sudan is organized and monopolized by the Gum Arabic Company (GAC). In 1969, this public company was established under the Companies Ordinance of 1925 for Gum Arabic exporting.

The markets of gum arabic are classified as central or city markets such as El Obeid Auction market in North Kordofan State, Gedarif market (Eastern Sudan), Sennar, Nyala (Darfur) and Damazin (Blue Nile); urban markets found in small towns and rural markets, which are situated in rural areas.

The value chain actors for Gum Arabic includes the following nodes: Producers (tappers and collectors), Village merchants, Traders and middlemen, Auction markets, Processors, and Exporters.

The price mechanism for gum arabic was dependent on a minimum floor price set by the government based on the estimated export prices to protect producers. However, recently the minimum floor price was abolished due to liberalization policies. The market's fees against provided services have been imposed by the state authority to compensate for the taxes and fees on agricultural products abolished by the federal government. In addition to taxes and fees of federal nature, there are other taxes on the level of state and localities which constitute duplication of taxes on the same crop. Moreover, there are additional fees imposed by the ministry of foreign trade on export crops.

Gum and resin resources collection and processing involves thousands of jobs almost throughout the year since, even when their collection is seasonal, processing and grading activities might remain for longer periods, at least at the main processing and main marketing places. According to some estimates

by the World Bank, the number of people involved in the activities pertained to Gum Arabic is more than 6 million. It is also noticed that women and youth involvement in this sub-sector is quite significant especially in the rural areas along the gum belt.

2.5 Situation Analysis in UGANDA

2.5.1 National Production and Economic Contribution to the Household

Within Northern Uganda, Gum Arabica is harvested from the wild habitat of Karamoja sub-region in North East Uganda. A survey for a Moroto project supported by International Development Research Centre, IDRC, revealed in 2004 that the density of *Acacia senegal* ranges between 425-1,700 trees per hectare. Considering the lower density of 425 trees per hectare, it is estimated that Karamoja alone has about 1 billion trees in an area of about 27,321sq.km, according to the National Biomass programme, Forest department. Annually at least 7,000 tones produce in the wild from Karamoja.

Related products produced in the region include Aloe spps and Shea nuts. In the sub-region, Gum-Arabic is used both a source of food as well as sold for income.

2.5.2 Exports and Economic Contribution to the National Economy

Most of the gum produced in Uganda is exported to international markets for use in pharmaceutical, food and printing sectors. Production is mainly undertaken at a household level; nonetheless, there is a cooperative—Uganda Gum Arabic Cooperative Society—that organizes farmers. These cooperative mainly engages in sorting and packing of the Gum-Arabic. The cooperative society was formed in 2002 and current membership stands at 2,000. The cooperative purchases gum from producers at about US\$ 0.9 and sells to traders at US\$ 1.3 per kilogram⁸.

Nonetheless, the prices received beyond East Africa range from \$2.30 to \$3.70 per kilogram. In term of economic contribution, the forestry Department of Uganda estimates that all NWFP commercialization contributes US\$66 billion (approximately US\$33 million) per year to national income. NWFP contribute 15% of the forest sector's contribution to gross domestic product (GDP).

2.5.3 The Value Chain, Employment and Gender

Gum Arabic is widely used in food as well as in the pharmaceutical industry. The Uganda government, through a Presidential initiative intends to empower the people of Karamoja sub-region (North Est of Uganda) to diversify their livelihoods through harnessing of natural resources. In particular, the initiative is focusing on the sustainable use of Gum Arabic and other dry land products for improved livelihoods and biodiversity conservation.

Following the appointment of a task force on the development of Gum Arabic in the Karamoja sub-region as an alternative source of income and livelihood, it was decided to fast-track the mapping and resource assessment of Gum Arabic, resins and other commercially important dry land resources in the region.

The Regional Centre for Mapping of Resource for Development (RCMRD) based in Nairobi, and the Network for Natural Gums and Resins in Africa (NGARA) were identified to spearhead the processes of resource assessment and mapping, as well as recommending methods for sustainable production and marketing of Gum Arabic and other related resources from the Karamoja sub-region. This process is on-going.

8 source: Obua *et al.*, 2006

3. Socio-Economic Contribution of Forest Spices to GDP in IGAD

Subsequent sections provide a quick situational analysis of **forest spices sub-sector in IGAD member states countries** with a view at the economic contribution and production potential.

3.1 Situation Analysis in DJIBOUTI

3.1.1 National Production, Marketing and Economic Potential

It is estimated that there are 2000 ha of forests and 68 000 ha⁹ of open woodlands in Djibouti. The largest forest in Djibouti is Day Forest in Goda Massif. This isolated forest is surrounded by endless semi-deserts and deserts of Afar region and there is only one more, smaller forest in Mabla Mountains to the east.

Formally Day Forest is the oldest national park in Djibouti. In spite of its status, this forest is endangered and in fact - disappearing. Over the last two centuries there have been lost 88% of the area of Day Forest, more than 20% have been lost over the last 20 years. One of the main reasons for this demise is climate change. In fact, the climate in this region is becoming increasingly hot and dry - not suitable for forest.

In conclusion, the forest resources of the drier areas of Djibouti have never been utilized properly. These resources are regarded, usually, as marginal with little value as in most cases; emphasis is given to reined and irrigated agriculture at the expense of these woodlands.

3.1.2 Challenges and Suggestion to Improve the Sub- Sector

Local people, sedentary Afars in nine villages around the forest mountains, use the forest and its resources to survive in this area. These forests and woodlands provide various products to rural households, mostly at the subsistence level.

It's widely used by populations for firewood and charcoal production; the collection of fibers and woody materials for housing and fencing; and some forest spices for their basic household subsistence. People rely almost entirely on sourcing them from locally-occurring trees and plant species, as most of these items are unavailable or unaffordable.

In Djibouti town and other districts next to the forest (as Tadjourah), the urban population is mostly using some industrial spices, imported from overseas or from neighbor countries as Ethiopia.

3.2 Situation Analysis in ETHIOPIA

3.2.1 National Production and Economic Contribution

The spices production is one of the best known production and marketing in Ethiopia. Spice trading is ancient. Farmers do have always a portion of their farm for spice because of its nature as a cash income. Forestspices harvesting is wide spread in many areas of Southern Ethiopia. They are among the NWFPs that provide household's income and economic benefit to the nation. There are two spice types that which are still collected from the forest, traded and exported. These are Ethiopian Cardamom (*Aframomum korerima*) and Long Pepper –locally known as Timiz (*Piper longum*).

Ethiopian cardamom is a potential substitute for the Indian cardamom (Jansen), and it has been found to have superior qualities compared to jansen. Both species are endemic to the rainforests of the southwestern region of Ethiopia. They are found also as indigenous species in the forests of Shekicho-Keficho and Bench Maji and woodlands of southwestern Ethiopia. The area is known to have a great potential for these spices production. The species can easily be propagated from rhizomes and seed.

9 source: CNE 1991

Although accurate data is not available currently, the use of spices for local economy is considerable. For example, the contribution from the major NWFs (forest coffee, honey and spices) accounted for 47% of annual household income in Bonga forest area, Southwestern Ethiopia.

3.2.2 Challenges and Suggestion to Improve the Sub- Sector

Ethiopia data from 1997-2015 on the export of Cardamom showed a very small volume between 1997 and 2009 and started to increase sharply from 2009 to 2014. The volume of export during the same period was 8,603 tons in total while there was an import of Cardamom during the same period which amounted to 690 tons, indicating that the import volume of the product cannot be ignored. Therefore, considering the existing potential for production and the value of spices for local and national economy and the need for their export promotion and minimizing the import is vital.

3.3 Situation Analysis in KENYA

3.3.1 National Production and Economic Contribution

In Kenya, the well-known forest spices include mainly the indigenous fruit trees, which play an important role in the livelihoods of most vulnerable communities during stress times. The forest fruits significantly improve nutrition by providing vital nutrients and essential vitamins, provide a source of food during droughts and improve livelihoods of the farmers. There is also a new trend towards consumption of indigenous foods among an increasingly health conscious population.

The main high value indigenous fruits such as *Tamarindus indica*, *Adansonia digitata*, *Vitex payos*, *Sclerocarya birrea*, and *Berchemia discolor* can be a reliable supplemental household food and income source for communities in the ASALs where they are found.

The fruits such as *Tamarindus indica*, *Adansonia digitata* and *Sclerocarya birrea* are being processed on a limited scale to produce commercial products like ice drink, jams and sweets.

Sclerocarya birrea though not very popular in local markets has high potential for commercialization based on the experience from Southern Africa where commercial products such as wine (Amarula) are sold on the international market. Indigenous fruits also earn foreign income but the level is very low.

The export destinations for some of indigenous fruits include Tanzania, Zanzibar and the Middle East (mostly Yemen).

It was not possible to get the contribution of indigenous fruit trees to the national GDP. They are recognized as reliable supplemental household food and income supply source especially in dryland areas.

3.3.2 Challenges and Suggestion to Improve the Sub- Sector

This sub-sector is still small and not very developed, the main constraints include:

- No guidelines /or national framework on management and propagation of the species
- Inadequate basic data and information on marketing aspects of indigenous fruits
- No established culture of planting in small scale or large scale farms
- Lack of critical institutional support in Research and Development
- Underdeveloped processing, marketing and the value chain of the sub-sector

As recommendations in finding some solutions to some of the above challenges and because this small sub-sector could be potential, the main opportunities for intervention could contain:

- Improved processing technologies and product quality
- Continued training of communities on value addition on indigenous fruit trees
- Development of guidelines for the household on management and propagation of Indigenous Fruit Trees
- Development of cottage industries and link to markets

3.4 Situation Analysis in SUDAN

3.4.1 National Production and Economic Contribution

The production of forest spices is one of the locally practiced activities in Sudan, especially in the rural rain-fed areas. Local trading in these spices is also one of the main sources of incomes of rural people in the country especially during off-seasons. These spices, in addition to the incomes derived from their sale, they also represent a source of food, medicinal and industrial benefits.

The forest spices include some aromatic and medicinal plants that grow in the forests and they are harvested for home consumption and local sales and to a limit extent, for exports. They also include various fruits that are used for soft drinks preparation and for food. Examples of these products include tannin from *A. nilotica* and oil from *Vitellaria paradoxa* which are potential commodities for local markets and for exports. Other forest fruits include *Balanites aegyptiaca* (locally known as Laloob), *Adansonia digitata* (Gongolez), *Grewia tenax* (Godeim), *Ziziphus spina-christi* (Nabag), *Hyphaene thebeica* (Dom), *Tamarindus indica* (Aradeb), and *Borassus aethiopicum* (Daleb). These are used as food, beverage, medicine and other multiple uses.

The aromatic and medical plants are the main sources of medicines, spices, and taste additives. They also help in production of homemade perfumes by the Sudanese households, cosmetics and home-made medicines.

In general, the contribution of the forest sector to the national economy is under-estimated; with the formal accounting system used in Sudan estimated the contribution of this sector to the GDP in a range of 1% to 3%. In Sudan, income generation from the forest sector in general income at the government level, and at the household level, where the majority of the Sudanese rural households are dependent on forest products for livelihood support and income generation for elderly, women and children among the population segments.

Among the challenges of this sub-sector: it is still at its earliest stage of development and production; it's practiced at a very low level with of course very low productivity levels; in addition, it has poor linkages to markets.

Table 6: Contribution of the Different Forests Products to the Total Income from Forests

Products	Mean (%)
Firewood and charcoal	30.5
Fruits	18.7
Fencing material	12.2
Leaves and bark	7.2
Seeds	7.2
Gums	12.9
Palm leaves 'Saaf'	5.4
Honey	6.1
Oil	2.0
Antiques	5.0

Source: IGAD report (2011)

3.4.2 Challenges and Suggestion to Improve the Sub- Sector

This sub-sector is still small and not very developed, with poor information and use of a very traditional ways in production and marketing. Among the challenges are the following:

- Inadequate access to proper knowledge of processing and marketing facilities for good quality production
- Inadequate access to proper knowledge about packaging for better marketing
- Traders and producers have no access to finance to build processing and storage facilities
- Inadequate access to good varieties and lack of standards and grading systems

As recommendations in finding some solutions to some of the above challenges and because this small sub-sector could be very potential, we can recommend the following:

- Improving the quality of the products and for increasing the quantities of the them, this will need to enhance the capacity of the producers by availing trainings and building their skills.
- The improvement of the sector also need to undertake some improvements in harvesting and post-harvest techniques.
- The sector also require a lot of efforts on providing the producers with access to finance so that they can perform well in terms of production and marketing
- It seemed that very little research had been done on the area of spices in the country so oriented research could be done to help overcoming some of the problems.

4. Socio-Economic Contribution of Honey and Beeswax to GDP in IGAD

Subsequent sections provide a quick situational analysis of **honey and beeswax sub-sector in IGAD member states countries** with a view at the economic contribution and production potential.

4.1 Situation Analysis in DJIBOUTI

4.1.1 National Production and Economic Contribution

In Djibouti beekeeping is a traditional activity practiced by nomad population who lives in altitude and mountainous areas of the north (in Goda and Mabla Mountains), in the Tadjourah region. However, the local production of wild honey is very limited and it's almost exclusively used for local consumption. Most of the wild honey sold on the domestic market is coming from neighbour countries mainly Ethiopia, who is an important honey and beeswax producer in the Horn of Africa region.

Further to different initiatives of beekeeping producers and pilot projects funded by international donors such as FAO or European Union, the apiculture activity gain the attention of Djibouti gouvernement. Recently, the Ministry of Agriculture showed their interest to advocate for the integration of beekeeping in the diversification of agricultural activities.

The potential of the Djiboutian landscape for honey and beeswax production doesn't been properly assessed, but there are some prevision and estimation based on the apiculture projects which have been implemented by NGOs.

Therefore, according to these pilot projects if a dozen hives are equipped in each farms selected in areas with high potential, the expected production would be around 300 kg of honey /year /exploitation and net income estimated at 2530 USD/ year / exploitation.

4.1.2 Challenges and Suggestion to Improve the Sub- Sector

Djibouti didn't really start the production or commercialization of honey and beeswax, then there is no specific strategies in place regarding the processing or involvement of women and youth in the production.

However, great attention has to be given to train the workers and farmers in apiculture so that they acquire better knowledge and develop skills in modern techniques in beekeeping. The gouvernement should also support local artisans in the production of improved hives for apiculture activities. In fact the installation of beehives and sufficient equipment for beekeeping would enable them to increase the production of honey and beeswax and consequently improve their income.

4.2 Situation Analysis in ETHIOPIA

4.2.1 National Production and Economic Contribution to the Household

Having about 10 million bee colonies has put Ethiopia not only being the largest bee populous nation in Africa but also the largest honey producer and the 10th largest honey producer all over the world. Beekeeping is a long traditional activity in Ethiopia and it supports considerable livelihood for both income and food in rural and urban Ethiopia.

Honey and beeswax represent extremely significant product throughout Ethiopia and is an important traditional activity in rural Ethiopia. Beekeeping is known to provide nutritional, economic and ecological services to the rural communities at the household level and to the nation at large. This, being a non-land-based activity, it does not compete with other resource demanding activities of farming systems.

The vast majority of honey producers continue to use traditional log hives, although a small number of producers have begun to use both transitional and modern hives. Production in many cases does not exceed subsistence levels and processing within the household rarely goes beyond the separation of the honey and beeswax. This traditional system is less productive with the average of 5-6 kg of honey yield per hive per year, while from the improved one, an average of 15-20 kg is attainable. Use of modern bee hives to boost honey production is emerging but expansion is very slow. Processing, grading and packing the products are done mostly manually and thus labor intensive and a potential source of rural job creation. An increase in global demand for natural products indicates a very high commercialization potential provided that support to promote trade, quality production and resource development are provided.

About 5.1 million hives are estimated to be found in rural sedentary areas of the country, where 96.38% of the hives are traditional types. In 2012, total honey production is estimated at 39.89 million kilograms. The average yield of honey per hive is respectively estimated 1.55, 1.57, and 1.56 kg from traditional, intermediate and modern hives¹⁰.

Wax is useful primarily for comb foundation making, cosmetic industries, candle making, ointment and cream, varnishes and polishes, creating special forms and surfaces for artistic sculptures and for queen cups preparation to be used for queen rearing to develop and multiply bee colonies. In Ethiopia, beeswax is largely collected from traditional beehives rather than the moveable frame beehives. The wax yield from traditional beehives is estimated to be 8–10 % of the honey yield, compared to 0.5 % – 2 % from frame beehives¹¹. It is estimated that the annual production of wax stands at 3200 tones, without taking into account the beeswax wasted or lost in the rural areas.

The wax is mostly left or thrown away and the people are not aware that the beeswax is generating attractive money. Even so, the yearly beeswax production is estimated to 5000 tons. This makes Ethiopia the fourth largest beeswax producing country in the world after China, Mexico and Turkey¹². Like honey, beeswax is also a multipurpose natural bee product, which is used in the manufacture of more than 300 commodities. Moreover, beeswax is used in manufacture of electronic components, in modeling, casting for industry, in polishes for shoes, furniture, floors and in specialized industrial lubricants. Honey and beeswax also play a big role in the cultural and religious life of the people of Ethiopia.

The annual honey production in Ethiopia varies from year to year based on favorable weather conditions for the bees. For example the annual natural honey production of the country was 24,600 tons¹³ per year and the estimate was based on 65% and 75% occupational efficiency of 7.5 million traditional, and 20 thousand framed improved hives respectively. Currently, the honey production in the country estimated to 39,891 tons per year from 4.99 million bee hives¹⁴. This shows that the annual production kept on growing. Of the total production, about 20% is used as table honey in rural areas, 55-60% is used in the production of a local alcoholic drink known as “tej” (mead), and the remaining part is sold in the markets of major cities such as Addis Ababa and other cities in Ethiopia. The bulk supply of beeswax is obtained as residual from “Tej” brewing.

The direct contribution of beekeeping to the economy could include the value that is generated from products such as honey, beeswax, queen and bee colonies, and other products such as pollen, royal jelly, bee venom, and propolis in cosmetics and medicine.

10 source: Central Statistical Agency, 2011 & 2012

11 source: MoARD, 2006

12 source: MoA and ILRI. 2013

13 source : CSA (2012)

14 source: Yetimwork, (2015)

Table 7: Total Number of Bee Hives and Honey Production by Region in 2011/2012, Ethiopian

Geographical area	All types of beehive		Traditional		Intermediate beehive		Modern bee hive	
	No of beehive	Annual production (kg)	No of hive	Annual honey production	No. of beehive	Annual honey production	No. of beehive	Annual honey production
Ethiopia	4,993,815	39,891,459	4,772,537	36,487,937	81,596	475,,855	139,682	2,927,667
Tigray	219,036	2,432,652	169,048	1,649,966	2,171	40,117	47,817	742,570
Amhara	965,293	8,684,393	898,863	7,891,333	23,802	139,914	42,628	653,146
Oromia	2,738,127	18,520,532	2,654,266	16,903,546	43,499	207,309	40,362	*
Gumuz	230,241	1,079,157	228,430	1,062,721	*	*	*	*
SNNPR	779,235	8,077,588	760,342	7,885,526	11,162	82,196	7,730	109,866
Gambella	58,402	1,090,386	58,299	1,088,355	11,162	82,196	7730	109,866
Harari	928	4,215	869	4,215	*	*	-	-
Dire Dawa	756	1,697	646	1,436	*	*	*	*

Source: CSA, (2012)

4.2.2 Exports and Economic Contribution to the National Economy

Based on the export data between the periods 1997-2015 Ethiopia has exported 5,363, 4,522 tons of natural honey and 2,316 tons of bee wax and other insect wax respectively and obtained a revenue of USD 17,882,208; 14,910,845 and 15,946,573 from each respective commodities which summed up an USD 48,739,626¹⁵. An estimate done for Honey and beeswax, during the accounting period of 1995 (and 2005), shows that the value of honey contribution to forestry sector is ETB 85.5 million (and ETB 108.0 million) and that of beeswax is ETB 16.9 million (and ETB 42.2 million)¹⁶.

The trend of honey exports from the country, particularly for honey and other insect waxes, increasing since 2005/2006 both in volume and value. Beeswax export is also an established trade in Ethiopia.

The country is the leading beeswax producer and exporter in Africa and fourth in the world overall. The annual average value of beeswax produced in the country is about ETB 125 million. The amount of beeswax being exported is, however, very low compared to the quantity being produced. The introduction and efforts to expand the transitional beehives is believed to increase the productivity as well as the potential for export through channeling beeswax to wax processors.

4.2.3 The Value Addition Strategies and Employment

Honey production in Ethiopia is dominated by smallholder producers who practice traditional production system using traditional hives. This traditional production system is less productive with the average of 5-6 kg of honey yield per hive per year, while from the improved one, on average of 15-20 kg is possible. Meanwhile, there is large and growing demand for honey and other bee products worldwide since it has nutritional and/or medicinal values. The use of modern box hives could yield about twice as much honey.

Although the annual production of both honey and wax is large as compared to other African countries, the system of production commonly exercised in the country is traditional and the role of processing companies and cooperatives is minimal. Moreover, the whole sellers in most of the rural areas collect the honey from the beekeepers and resell or redistribute to other consumers, retailers in the region and to the capital Addis Ababa. Major buyers of crude honey are the owners of local drinking houses, who separate the honey and wax themselves. From the honey they brew mead known as “tej”, which they

15 source: ERCA (2015)

16 source: Sisay *et al.* 2010

retail themselves. The wax is sold as a by-product to wax collectors who in turn trade with processing companies. The value of the product exported by these companies far exceeds that of honey itself.

Ministry of Agriculture and Natural resources (MoA) is responsible for the overall development of apiculture in the country. The Holeta Bee Research and Training Center, the Assela and Agarfa Farmers Training Centers are involved in the production of trained manpower and beekeeping extension activities. Following the establishment of the Regional National States, the Regional Agricultural Bureau of the respective regional states took over the responsibility of the sectoral development. To increase the production of honey and beeswax attention has been given to train extension workers and farmers in apiculture so that they develop skills that would enable them to improve the backward bee culture.

4.3 Situation Analysis in KENYA

4.3.1 National Production and Economic Contribution

Kenya have a high potential for bee products and honey production due to the abundance of bee flora. Beekeeping is best suited in Kenya due to the nature of the prevailing species of plants, mainly acacia, which are able to flower quickly with little amounts of moisture.

Kenya has an estimated annual honey production potential of 100,000 tons and 10, 000 tons of beeswax. However, only a fifth of this potential is currently exploited¹⁷. Current annual production is estimated at slightly over 25,000 tons, contributing about 4.3 billion Kenya Shillings (KSh) from honey alone. In order to address the gap between potential and actual production, the National Beekeeping Policy was formulated in 2013. To Successfully addressing this gap requires short, medium and long term measures. This may include support through short term interventions. In so doing it is recommended that adequate consultations be made with the County Governments in the honey producing areas and the Kenya Honey Council to address some of the constraints.

Honey production and consumption in Kenya is far from the optimum. There is production of quality honey in some areas though production in some areas is declining. Production infrastructure is inadequate (hives, markets, transport).The policy and regulatory framework is weak .Production and marketing institutions are weak or nonexistent. The continued use of pesticides in food production in food producing areas is also a major threat to bees. The main threats are from climate change/deforestation especially in the ASAL regions where deforestation for charcoal production is rampant and re-forestation is a challenge due to low and unreliable rainfall. Moreover, market linkages with producers are weak.

The potential for growth in honey and honey products and honey markets exists. The national Bee keeping council contends that market prices for quality honey are low. Presumably, those buyers who appreciate the quality of local honeys are willing to pay up to KSh 1,000 per kg. It is conceivable however, that so long as the package has a Kenya Bureau of Standards (KEBS) label and a bar code, the ordinary Kenyan consumer has no way to distinguish between “quality” honey from “ordinary” honey. Unconfirmed reports indicated that some Kenyan honeys were being exported to the Middle East where they were being used to blend other honeys.

But so are threats to this growth. Local demand for quality honey/honey products is greater than the supply. The area available for honey production is extensive and has hardly been exploited. Stingless bees which would be suitable for food producing regions also produce good honey. And initial investments in the production process are relatively low. Enhancing growth requires that the threats be controlled and opportunities be exploited.

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USAID, 2011 The World Market For honey Market survey: capacity to improve agriculture and food security CIAFS

Table 8: Honey Export in Kenya 2004-2014

Year	Quantity (M/T)	Value (USD)	% GDP
2004	8.760	8600	Na
2005	2.256	3106.35	0.0013
2006	9.241	19,067.21	0.0074
2007	26.952	42,669.00	0.0163
2008	7.935	22,456.68	0.0017
2009	12.315	25,542.60	0.0029
2010	18.871	47,716.82	0.0060
2011	28.659	93,087.76	0.0109
2012	88.825	11,0222.02	0.0118
2013	32.420	102,653.41	0.0123
2014	19.074	56,329.25	0.0055
Total	255308	53,145,110	
Mean	23209.81	4,831,373.64	

Source: Center for Business Information, Kenya Export Promotion Council

4.3.2 The Value Chain and Employment

The most common activity in processing of raw honey is the simple removal of the honey and combs from the hive to produce the raw honey. The unrefined honey is taken through an extractor that removes the combs and other ingredients. A manual extractor can do limited refining. This semi refined honey is sold to consumers, traders and processors. Traders and processors take this honey through another refining process. This advanced refining involves a centrifugal and blending process which refines the honey into pure honey and other products. Honey processors are interested in getting a reliable supply of quality honey for processing.

The processed honey is graded, packed in plastic containers and labeled. Honey from this process can be branded and sold to local consumers and users in Nairobi and Mombasa. Although bee hives can produce beeswax, honey, propolis, pollen, bee venom, royal jelly, bee colonies, bee brood, queen bees and package bees among others, the main products being produced by honey processors are honey, propolis and beeswax.

The bee keeping industry provides income to an estimated 90,340 farmers and an additional 900 artisans employed in manufacturing hives and accessories. Overall, it is estimated that up to 547,440 persons directly benefit from beekeeping activities. It provides indirect support to other persons in the confectionery, Pharmaceutical, herbal, brewing, cosmetics, transport, and packaging material manufacturers and other players along the value chain¹⁸.

4.4 Situation Analysis in SUDAN

4.4.1 National Production and Economic Contribution

The majority of honey production in Sudan is organized along the traditional techniques with the use of traditional log hives, although a small number of producers have begun to use modern hives. Production in many cases does not exceed subsistence levels and processing within the household rarely goes beyond the separation of the honey and beeswax. This traditional production system is less productive with the average of 3-5 kg of honey yield per hive per year, while from the improved one, on average of 15-20 kg is attainable.

18 <http://www.africanbusinessmagazine.com/features/agriculture/the-money-is-in-the-honey:New African> | Tuesday, 28 January 2014 09:24/ (accessed 25.3.2014)

Honey bees produce a range of useful and readily used and marketable products which require relatively little post-harvest processing. Beekeeping is a type of land use activity that offers great potential for the socio-economic development of the people livelihoods and it plays a significant role in Sudan. It provides medicines, food and incomes.

According to Elzaki and Mohamed (2015) more than 90% of the Sudanese honey and beeswax are produced by traditional beekeepers in different kinds of hives manufactured locally and adopted for use with the indigenous bees. The number of beekeepers in Sudan expected to be 10,000; producing more than 204 tons of honey from 500 bee colonies by using traditional beekeeping.

According to Ministry of Livestock, Rangelands and Fisheries, Sudan Bee Honey production increases to more than half million tons during the year 2013. The exported amount is very little despite the fact that Sudan's honey is among the world's best honeys.

The average production of honey in the country is only estimated by 120,000 tons per year. Some amount (small) of this quantities are usually exported to Gulf region, although there is high demands for Sudanese honey as it is characterized by good natural specifications. The lack of proper conducive production environment blocked this opportunity. The investment in this field is more profitable as the international price is around seven thousand US dollars per ton in addition to others honey products (royal jelly). In addition the honey production sectors has added value as its increase other agricultural crops production and quality through pollination. The Ministry vision is to work hardly to improve this sector with expectations for the honey sub-sector to contribute \$500 million annually to the GDP.

4.4.2 The Value Chain and Employment

The sector is dominated by smallholder producers who practice traditional production system using traditional hives. Beekeeping is a family activity which has a plenty of advantages compared to other types of Agriculture: it needs a relatively small investment and depends on little land without specific demands on the quality of the land. It is a flexible activity for both sexes of any age. Beekeeping can be carried out as a productive secondary activity with low-level technology, or as a primary undertaking with more complicated techniques. In addition beekeeping does not compete for resources with other types of agriculture - the nectar and pollen of plants are a true bonus.

The most of beekeeping practices are traditionally made and scattered all over Sudan, but concentrated in some specific states; south and North Darfur, South Kordofan, Blue Nile and Gedarif states. Regarding the private sector involvement in this sector, there are about 9 private companies, 3 of which are relatively big and the others are small.

The man power working in honey sector is estimated by 30,000, two thirds of these are attached to the traditional beekeeping practices, the number of people involved in marketing of honey is estimated by 10,000, on the other hand the scientific cadres working or specialized in this field are amount to 406.

4.5 Situation Analysis in UGANDA

4.5.1 National Production and Economic Contribution to the Household

Beekeeping is an important alternative livelihood sector although overall honey production in Uganda remains very low partly due to the rudimentary methods used in production and the extent to which bee keeping is considered as a business.

The majority of beekeepers in Uganda are small scale producers mainly using traditional hives. Uganda has an estimated 2 million beehives and at least 66% of the hives are colonized per season. According to the 2014 multi-stakeholder platform (MSP) for beekeeping in Uganda, at least 87% of production is by traditional log bee hives (made from local bark of trees and reeds) while 13% is by Kenya Top Bar (made FROM normal high humid timber and imported from Kenya) and Langstroth (made from

kiln-dried timber and imported from USA). The ownership of beehives generally ranges 1-160 with an average of 28 beehives per farmer.¹⁹

The annual demand for honey in Uganda was 3,600 metric tons but the country's production of honey could not meet the demand. As such, some of the honey consumed in Uganda is imported. Annual production is estimated at 2,600 tons annually and this represents about 5% of the estimated potential production of 50,000 tons. Honey production in Uganda is affected by seasonality with the peak season for production occurring during February-May of each year.

There are 5 key stages in honey production in Uganda namely²⁰: (i) the acquisition of inputs—especially land to house the bee hives; (ii) establishing and managing apiary; (iii) harvesting and extraction of honey and other by-products; (iv) initial traditional processing using either the press or drip methods; and (v) factory processing for standardization. Processes 1-4 are mainly undertaken by small farmer groups in Northern Uganda; predominantly West Nile and also parts of Western Uganda.

4.5.2 Exports and Economic Contribution to the National Economy

Overall, the amount of honey traded annually generates US\$ 38.4 million²¹. Furthermore, apart from employment, the contribution of the sector to exports is generally low since only 5% of the local production is exported. Nonetheless, since 2005, Uganda is listed as one of the developing countries allowed to export honey to the European Union (EU).

Apart from honey, there are other products of beekeeping, including wax and bee wax generates US\$ 5.2 million per annum. Estimates by MAAIF show that other less valuable products include: Honey wine generating (US\$ 0.9 million pa); Propolis (US\$ 0.32 million pa); and Bee venom (less than US\$ 0.1 million). Overall, the market for honey products remains relatively underexploited despite the availability of proven technologies to utilize them.

4.5.3 The Value Addition Strategies and Employment

The apiculture value chain is composed of: input suppliers, bee keepers, bulkers, processors, transporters; export processors; retailers and consumers. The apiculture sector employs an estimated 1.2 million persons²². However, for the majority of those engaged in the sector are not on full time basis and only a few consider bee keeping as a business.

Women are involved in the industry but mainly in the processing and marketing of honey products. Majority of the processors are employing casual laborers whose monthly average wage is UGX 150,000. This is at least 50% more than the median wage for agriculture in rural areas in 2012/13 and suggests that bee keeping has a huge economic potential—at least of providing high agricultural incomes. Furthermore, the relatively lower demands for apiary production makes the sector attractive due to lower investment and maintenance costs.

With regard to apiculture process chain, limited financing is a major challenge. Most of the marketing is organized along district producer organizations which however have limited resources to procure the honey produced by members. As such, a large proportion of the honey is marketed individually. For instance, the largest honey processing company in Uganda—Bee Natural Products (BNP) has links to various producer groups in West Nile but only 20%²³ of the honey processed by the company is sourced from produced groups and the rest acquired from individual bee keepers and traders. Individual marketing increases the cost of doing business. Aside, from financing and marketing challenges, most processors in Uganda are operating below capacity due to insufficient volumes supplied by beekeepers.

19 Source : TUNADO, 2014

20 source : Nadelman *et al.*, (2005)

21 MAAIF, 2014

22 source: UBoS, 2010

23 source: Lync *et al.*, 2014, Kilimo Trust, 2012

5. Socio-economic contribution of Artisanal Mining to GDP in IGAD

This section aims to provide current situation analysis and normative framework supporting **artisanal and small-scale production and processing of minerals** for the development in the ASALs of IGAD Member States.

5.1 Situation analysis in DJIBOUTI

5.1.1 National Production and Economic Contribution

Mining and manufacturing in Djibouti accounts only for around 3 percent of the gross domestic product (GDP), which stood at around \$1.6 billion. Djibouti has been known to produce occasional small quantities of gravel, crushed and dimension stone for domestic construction projects and mineral salt mostly for export. Mineral occurrences of potential economic interest also included clays, granite, limestone and marble, but it's no official data available for these products.

Artisanal mining (AM) is defined as being non-mechanized, and performed using rudimentary tool. The most important products mined through AM in Djibouti is salt. Salt is available in high quantities in the depressions as in the Lac Assal and explored for a long time by nomads moving between Djibouti and Ethiopia. They sold it or exchanged it against others items. This activity continues nowadays. With a salt crust 60 km² and 100 million tons of salt, lake Assal is the largest salt reserves underdeveloped world . It is also an ideal environment for the production of solar salt with an evaporation of 4 meters per year and annual precipitation rates are less than 20 cm per year. The rest of the lake is composed of 50 km² of salt water about 25 meters deep.

Semi-industrial salt production began in 1998 in response to increasing demand from Ethiopia. Salt production is extracted from evaporated pans by artisanal miners in the marshes of Tadjoura area. From around 8,000 tonnes before 1998, salt production rise to 173 000 tonnes in 2001, but declined in 2005, fault of being non competitive.

Table 9 : Production of Salt, 1998-2004

	1998	1999	2000	2001	2002	2003	2004 ^a
Production (Tones)	91 000	127 283	135 933	173 099	162 266	128 494	12 697
Number of companies	4	11	15	12	12	10	8

Source: Banque centrale de Djibouti (2003), *rapport annuel 2003*.

5.1.2 Challenges and Suggestion to Improve the Sub- Sector

In 2010 Djibouti decided to invest a total amount of 64 million USD to develop the Ghoubet port in Tadjoura region in order to industrialize the salt export from Lake Assal. This development is made with the support of Chinese investors and the port is expected to be operational by the year 2017.

Currently , specialized equipment has been set up to cultivate salt crystallization built directly on the salt crust , proximity to vast reserves of brine removes the need for expensive concentration ponds. Companies that have come to invest in the process of salt deployed a fleet of service trucks and the site of heavy trailers adapted to be held on the salt washplant and storage area aboard the salt marsh at Port Goubet to 20km. In the final step , Salt will be delivered to vessels up to 100,000 DWT , moored 44 meters from the pier in the SIS Goubet bay. Djibouti government expects a traffic of 4.5 million tonnes of salt to be exported through the port of Ghoubet. These huge operations left no place to artisanal extraction of salt for rural population living in this area. The trend is that artisanal mining of salt will disappear progressively.

5.2 Situation Analysis in ETHIOPIA

5.2.1 National Production and Economic Contribution to the Household

Ethiopia has a long tradition of artisanal gold and gem mining. The production of these commodities through artisanal mining (AM) is significant, and is reported to have grown rapidly in the last few years, especially with regards to gold but also gems, specifically opal.

In fact, the most important gem in terms of value is opal, which is mainly being mined at one locality in the North Wollo Zone, northeast of Addis Ababa. Opal from this locality is of much higher quality than those of other areas in Ethiopia and the so called “Wollo Opal” has gained popularity in the wider global markets since 2010.

In 2012, the production from AM was reported to be more important than large-scale operations for most metals and minerals mined, and also in terms of employment generation.

The amount of gold produced by AM is reported to have increased dramatically in recent years, from a bit more than 400 kg (13,000oz) in 2008/2009, to 8,000 kg (270,000oz) in 2011/2012²⁴. Recent strategic assessments conducted for the mining sector in Ethiopia shows that for example artisanal mining cooperatives had a production of 100g - 200 g gold/month, and more than 3 tons of ore is crushed daily.

Opal production increased from just 658 kg in 2000/09 to 25,078 kg by 2012/13. Scaling up of production of opal is limited by the technicalities of production, creating greater value from the rough stones has been recognized by the government and efforts have been made to encourage value addition activities.

The Ethiopian government encourages and recognizes the importance of AM and this is reflected in the organizational structure of the ministry of Mines. The AM is handled by a department which works as a main functions in the ministry, and this department is engaged in coordinating all issues of the sub-sector.

Table 10: Artisanal Mining and Production Estimate in Some Location in Ethiopia

Location	Type of production	Cooperatives	Production Estimate
Dolovia; Lege dembi, Southern Oromia	Alluvial gold (In water ways)	Organized cooperatives with 50 members	100- 200 g gold/month, which is estimated to be 2-4 g gold /month
Yubdo Woreda (Oromia - west)	Mostly alluvial gold and platinum to a lesser extent	One cooperative and up to 100 members most of them farmers	NA
Lege dembi area close to Nyota project's license area	Alluvial gold (In water ways)	Up to 500 active miners	4-5 g gold/month
Nejo Woreda (Oromia - west)	Alluvial gold (In water ways)	There are three licensed cooperatives and may be 700 miners	4-5 g gold/month
Menge Woreda (Benshangul-Gumuz)	Alluvial gold (In water ways)	74 associations in the region, as well as 56 licensed traders.	NA

Source: (MoM & WB, 2014)

²⁴ source : MoM and WB, 2014

5.2.2 Exports and Economic Contribution to the National Economy

In the 2011/2012 The Ethiopian Mining sector contributed about 1.5% to the GDP, with the mineral rents²⁵ accounting for 1.1% of GDP.

Export revenues from opals have been increasing over the past few years, with the opals sold through licensed exporters they are required to pay USD 1,500/kg for first grade rough stones, USD 800/kg for second grade and USD 450/kg for third grade opals. Opal have been a significant source of foreign exchange, accounting for over 90% of the precious stone export revenues earned in 2011 (USD 3.8 million) and (USD 2.08 million) in 2012 respectively. The largest rough stone was destined to India, while the US was the main importer of polished stones.

This sector accounted for USD 618 million (19%) of the country's export, with gold making up close to 100% of the mining sector export with most of this being Gold (about 2/3) coming from artisanal mining.²⁶

5.2.3 The Value Addition Strategies and Employment

The sector remains important and a total of about 1 million people ²⁷are directly engaged in AM in Ethiopia, about a third of which are concerned with gold mining. The MoM estimates that there were about 2,000 people in 7 associations involved in gemstone production in 2012 and over 200 exporters in Ethiopia. Miners sell their stones to brokers who in turn will have them valued by the MoM. However, it needs to be kept in mind that it is difficult to estimate the number of artisanal miners, and that such estimates must be interpreted with some caution. Problems with providing estimates relate to the fact that these activities are to a large extent informal and unregistered; the terrain is often difficult to access; and many miners are not full-time miners, but combine mining with other livelihoods.

Regarding AM according to a report made by the World Bank the number of people engaged in AM is estimated to range from 500,000 – 1million miners, out of which 62.5% are men and 37. 5% are women. The same study indicates that 87.0% of women and 77.1% of men have already been in mining business for more than 6 years. Men miners (57.8%) do the extraction and women miners (19.1%) are service providers, 28.2% do a mix of all activities in the mining sites. Miners reported doing mining throughout the year are (63.4%) while (43.2%) of miners do farming; 25.8% have no other livelihood options and 24.6% felt they do get reasonable income that compensate their efforts. In general there is less women participate in mineral transaction²⁸ .

5.3 Situation Analysis in KENYA

5.3.1 National Production and Economic Contribution

Kenya is endowed with enormous mineral resources, both metallic and non-metallic, which are known to occur in the many parts of the country. In the recent past, the discovery and other minerals has propelled Kenya as a new player in the global market for hydrocarbons and valued minerals. The International Monetary Fund (IMF) projects that oil production in Kenya is expected to start in six to seven years from now, giving the country time to prepare to manage its endowment to the achieve its development goals as stipulated in the 2030 Vision. In addition to oil, Kenya has potential reserves of gas, rare earth metals, coal, iron ore, gold, limestone, gypsum, soda ash, gemstones, manganese ore, fluorspar, diatomite, titanium, zircon, chromite, and niobium and silica sand. Most recently, Cortec Mining Kenya Limited has announced that Marima Hills in Kwale County has one of the largest rare earth mineral deposits in the world with a potential in-ground value of up to \$62.4 billion.

25 Mineral rent: The difference between the cost of production and its revenue value

26 source : MoM & WB, 2014

27 source: MoM and WB, 2014

28 source: Yared A. 2014

The country is very well known for gemstone mining, however, the small-scale artisanal miners dominate the industry. Artisanal mining accounts for over 60% of annual gemstone production in Kenya. In 2002 Kenya had an estimated production of 10.9 tonnes of Ruby corundum (compared to 5.86 tonnes in 2001) and 61.4 tonnes of gemstones (compared to 73.3 tonnes in 2001). There has been a decline in Kenya's gemstone mining industry recently; with the same traditional players continuing to dominate the sector.

Artisanal gold mining takes place in both farm and communal lands in Western Kenya (Siaya, Migori and Kakamega Counties) and Turkana respectively. The number of people fluctuates between 10,000-30,000 respectively depending on availability of gold and it is known to disrupt family life especially of children.

For example, in Taita Taveta County, it has been reported that the artisanal and small-scale miners who prospect for the minerals are violently evicted from the mines by powerful and well-connected large-scale prospectors, miners and traders who claim legal ownership of the land as soon as the locals discover mineral deposits. Conflicts between small-scale gemstone miners and large scale-miners gemstones miners arise because most of the land is not demarcated.

5.3.2 The Value Chain and Employment

There is limited information on artisanal mining in Kenya, including employment numbers, safety measures and effects on youth and women. It is estimated that there are about 30,000 people involved with artisanal minerals in Kenya, indirect beneficiaries including members of the households, local traders, processors and end market traders. Generally, men tend to have greater access to benefits and opportunities for extractive industries, while women bear more of the social, environmental and economic impacts. Promoting and working toward greater inclusiveness is key to ensuring that high-value resources as the extractive sector can provide sustainable livelihood opportunities for men and women equally.

Most artisanal is rudimentary in nature; the miners mainly use easily available explosives to break down the rocks in search of gemstones and precious metals. The health and environmental risks are enormous. Besides these issues, the markets for gemstones are not well established – a few dealers and brokers still control the entire process; the small-scale artisanal miners have limited market powers. It has been reported that there is a big black market selling of gemstone. The miners also lack the technical know-how, capacity, to correctly value the gemstones. The benefits accruing from the extractive industry are enormous and estimated to run into billions of Kenyan shillings, however there is no clear policy, regulatory & legislative framework to adequately address the issues of royalties and benefit sharing between the investors, communities, the county and national governments. The issue of resources royalties is a huge part of the debate about transforming the sector.

Mineral exploration and exploitation are presently governed by the Mining Act Cap. 306 of the Laws of Kenya enacted in 1940, but the legislative framework is now being reviewed in the proposed Mining and Minerals Bill. Since 2013 the government has formed a fully fledged Ministry of Mining to underscore the renewed focus on the revitalization of the mining sector. The proposed new National Policy on Mineral Resources and Mining sets out principles and policies that will guide the Government in the reform of mining sector regulation and promotion of minerals investment.

5.4 Situation Analysis in SUDAN

5.4.1 National Production and Economic Contribution to the Household

In Sudan, the Minister of Minerals issued a regulation called The Regulation of Traditional Mining for Gold (2012) which should not use heavy machinery and not practiced in deep zones. According to that it is allowable to citizens to practice traditional mining.

Gold pricing is maintained by the Central Bank of Sudan, in addition to organizing exports, trade and access to credit.

In Sudan, this activity is a gold- focused one, with limited activities on chromite, limestone and salt. In the majority of the states in Sudan (14 states), gold mining is practiced by small scale miners and they are estimated to be more than one million miners, with more than 4 million as dependents directly benefiting from these activities. This is in addition to over 30 types of occupations practiced within the gold mining and its processing centers.

During the period 2010 -2015, artisanal gold mining accounts for about 85% of the total gold extracted, with the total production for the same period of more than 280metric tons. On average, in 2015 more than 50,000 kg of gold produced by artisanal miners.

The gold produced by artisanal miners is processed through the Sudan Gold Refinery unit, in order to assure quality and standards. The establishment is a partnership project between the Central Bank of Sudan (70%), Ministry of Minerals (15%) and Ministry of Finance (15%). The total cost of the project is 9 million Euros.

The Sudan Gold Refinery has a current capacity of 150 tons of gold annually and 30 tons of Silver. It melts and casts gold, copper and silver. Its design capacity is 600 kg per day. The refinery depends on Electrical and chemical analysis. It is expected that the productivity will reach 400 kgs per day from within Sudan. It is operating under the direct supervision of the Bank of Sudan.

The Central Bank buys around 350 kgs of gold from citizens working in gold mining (traditional miners) while the refinery undertakes refining of 400-500 kgs of gold from these traditional miners. The refinery charges 50-60 USDs per kg. The Central Bank of Sudan currently buys the gold and exports it in the form of alloys that contains some impurities of silver and copper. The latter minerals are liable for export.

The citizens are allowed to deal directly with the refinery or through its agents. They approach the analysis laboratory for calibrating various samples. They are provided with a detailed report on the content of gold in each sample. The refinery can also provide the service of gold stamping in cooperation with the competent authorities. It is worth mentioning that the refinery is trying to acquire the international stamp so that the alloys are approved internationally and can be traded in all gold markets in the world. The refinery has refined more than 300 kgs as the first locally produced gold.

5.4.2 Export and Economic Contribution to the National Economy

Sudan export of gold is currently at the level of 20 KGs giving revenue of 1 billion USD and expected to increase to 3 billion USD. Last year's production reached 24 kgs of gold with a price of 50 millions USD per MT with a total income of 1.1 billion USD through the Bank of Sudan sales only. In addition the individuals export makes around 300 million USD. The sales of the Bank of Sudan that reached 2.8 billion USD from the traditional mining by the end of this year indicate a large reserve of gold. Currently, the refinery is focusing on serving local markets only but after three years, it will provide its services to the neighboring African markets after getting the certificate of quality and universal validity.

It also estimated in 2012 that more than USD\$ 2.15 billion came from gold exports, which represents about 46% of total national exports.

Earlier estimation for the contribution of mining sector to the national economy is not exceeding 4%, but nowadays, estimates go up to 8% to the GDP according to Ministry of Minerals.

Gold mining currently contributes 85% to the total national production.

Table 11: The Contribution of Mining and Quarrying to the GDP, Sudan

Year	GDP%
2009	0.2
2010	0.3
2011	0.2
2012	1.5
2013	2.3
2014	2.5

Source: Ibrahim (2015)

5.4.3 The Value Addition Strategies and Employment

In general, the mining sector has provided a wide spectrum of activities for the communities, households and the national economy. These activities could be summarised in the following:

- Exploration, mineral evaluation, mining development, and mine design
- Provision of services to companies in forms of drilling, feasibility studies, minerals processing and equipments, etc
- Laboratory-related industries
- Investment in training of farmers; mapping and evaluation of mineral resources
- other types of minerals industry added values

During 2015, the Ministry issued about 59 licenses, 221 contracts and about 221 sites of artisanal mining in 14 states of the 18 states of Sudan. In only one State, namely River Nile State, it has been estimated by the Ministry that artisanal mining is practiced in about 20 sites, organized along 4 main markets, mined by about 500,000 – 1,000,000 miners, upon whom more than 5 million people depend and earn their livelihoods.

More than one million individual involved in artisanal mining, with more than 5 millions as dependents and over 30 types of occupations are practiced.

The Ministry of Labour in Sudan has estimated the total number of artisanal miners who involved in gold mining in 2011 as 2 million.

Considering estimates of women participating in artisanal mining data is scantily available. But there is considerable number of women participating in this sub-sector especially in the rural areas. Also the sector creates considerable number of jobs for them apart from mining activities. In Blue Nile State, Ingessana Hills, Elmadani (2003) found that of about 1000 individuals practiced artisanal mining in the area, women and youth represented about 50%, with youth being 10% of them.

5.5 Situation Analysis in UGANDA

5.5.1 National Production and Economic Contribution to the Household

Historically, mining activities in Uganda were large scale and at its peak in the 1960s, mining contributed about 30% of Uganda's foreign earnings—mainly from Copper. The civil strife in the 1970s and subsequent fall in commodity prices led to the collapse of large scale mining. By the late 1980s, only artisanal small scale miners were undertaken in the country although its overall contribution to the national economy was lower than the historical averages. Today, mining activities in Uganda are dominated by Artisanal Small-scale Mining (ASM).

ASM accounts for 90% of all mining activities in Uganda. In terms of employment, ASM is a very important sector of the Ugandan economy, with an estimated 200,000 derived employments. The mining scene is dominated by local investors with very minimal foreign direct investments.

Although Uganda has a number of mineral resources, most of ASM operations are mining gold which accounts for about 10% of ASM employment²⁹. Most of the ASM operations are spread across the country, especially in North East Karamoja sub region, Mubende and Busia and Western Uganda. In some instances, ASM are linked to large scale producers e.g. mining limestone for Tororo Cement Limited in Karamoja sub-region. Very traditional and rudimentary methods are used in ASM. These include the use of panning and other hand held instruments. This is partly explained by the fact that most mines are alluvial. Only 5% of the ASM are licensed through the Department of Geology Mines and Survey (DGMS).

For some geographical areas e.g. Karamoja sub-region, ASM is a major contributor to the local economy. For instance, the sub-region accounts for about 10% of Uganda's ASM operations and about 80% of employment in ASM gold mining across the country. Table 1 shows the contribution of mining activities to the Karamoja economy (from the 21 licensed mining companies in the sub-region) and it is indicated that mining contributed UGX 27.6 billion (US\$ 12.6 million). Given the predominance of gold in Karamoja, the mineral contributes at least 90% of the local earnings although the total value of limestone produced in the sub-region is more than 4 times that of gold. Given Karamoja's relatively high overall deprivation rates, the above earnings are critical for livelihoods in the sub-region.³⁰

5.5.2 Exports and Economic Contribution to the National Economy

According to the 2015 national Statistical abstract, mining and quarrying contribute 1% of Uganda's GDP. Based on 2014/2015 GDP figures for Uganda (estimated at US\$ 27.4 billion), this translates to a contribution of US\$ 274 million per annum. Furthermore, the statistical abstract shows that the sector has registered rapid growth in the recent past, increasing by about 20% during the 2014/15. At the moment, the ASM sector contributes significantly to employment and in the recent past contributed substantially to foreign exchange earnings. For instance, in 2010, the export of Gold fetched Uganda US\$ 41 million which however reduced to US\$ 21.2 million by 2013.

5.5.3 The Value Addition Strategies and Employment

The gender composition of mining varies widely across Uganda. Estimates indicate the female involvement in ASM is in the range of 40-50 % of those employed. However, in the gold dominated Karamoja sub-region, the female share rises up to 90%³¹. The gender division of labour in Karamoja is explained by the fact that culturally men are supposed to take care of livestock.

At least 56,000 persons (0.32% of the total labour force) report working in the sub sector. Males account for 80% of those employed in mining. Furthermore, the chart shows that at least 31% of the mining workers are paid employees (the rest are self-account workers). Paid employees account for a higher share in urban areas (37%) and also among males (39%). It is worth noting that there are no female paid employees and this suggests that nearly all females in the sector are artisanal or small scale self-employed miners.

Finally, the analysis of the labour module of 2012/13 shows that the median wage paid to mining and quarrying employees in UGX 132,000 (US\$ 51) per month in 2012/13. This wage is more than twice the median wage for the agricultural sector (US\$ 25.5) but less than the median wage for all employees (US\$ 54.8) as well as employees in the manufacturing sector (US\$ 59.4).

29 source: Hinton, 2011, 2013

30 The 2012/13 Uganda National Household Survey showed that at least seven out of 10 individuals in Karamoja are classified as poor (Uganda Bureau of Statistics, 2014a). Furthermore, although the sub-region accounts for a relatively small share of the Ugandan population (3.4%), it nonetheless contributes about 21% of the overall poverty in the country.

31 source: Hinton *et al.*, 2012

Mining is considered a very important sector in Uganda and as such the country has developed a number of mining policies and regulations. These include: Mineral Policy (2001), Mining Act (2003), Mining Regulations (2004) and the Sustainable Management of Mineral Resources Project (SMMRP, 2004-11). Indeed, the current National Development Plan (NDP II) recognizes the need to integrate ASM in the whole mining value chain. However, a major challenge remains the enforcement. For instance, based on the 2004 Mining Act, royalties from mining are supposed to be shared using the following formula: 80% retained by Central Government, 17% to Local Government and 3% to the Land Owner. Nonetheless, there are numerous documented instances where Local Governments and land owners have not received the prescribed royalties³².

32 source : Hinton *et al.*, 2012; Houdet *et al.*, 2014

6. Conclusions and Recommendations in NWFPs and AM Sub-Sectors in IGAD

6.1 Main Conclusion on NWFPs and Artisanal Mining Sub-Sectors

Forests are the repositories of natural wealth in terms of flora and fauna. The economic value of same has long been recognized. The stock inventories have been an integral part of forest resources assessment although these inventories account primarily for timber species. Though not included in forest inventories non-wood forest products (NWFP) form a very important source of livelihood to communities living in the vicinity of forests and in pastoral areas in the IGAD region.

Non-wood forest products (NWFPs) are major sources for food, medicines, fodder, gums, fibre, and construction materials, which are important traded commodities providing employment and income at various levels in the supply chain. In times of emergencies and seasonal shortfalls in agricultural production, NWFPs are a source of food security. They also supplement income generation for the poor, while managing the resources in a sustainable manner. The communities need to understand and protect the ecological and socio-economic benefits derived from different NWFPs as well as build their capacities and skills to exploit these resources sustainably.

In the IGAD region, artisanal and small-scale mining (ASM) is mainly practiced in rural areas. The mining operations are done randomly. Artisanal mining is characterized by widespread use of rudimentary techniques and short-term mine planning. Most of the artisans do not have the requisite education, training, management skills and appropriate equipment. The mining sector has been growing rapidly in many member countries, creating employment opportunities; raising revenue to both central and local government through taxes, rents and royalties; and increasing income.

Thus, there is need for promotion of the sector so as to have a bigger contribution in economic development.

From this survey, we conclude that there is limited evidence of sustained attempts to promote and develop NWFPs and small-scale mining (ASM) as viable and sustainable businesses for the rural population. There is need to examine the potential of developing cooperatives/ bio-enterprises / small medium enterprises (SMEs) that aim to develop these latent artisanal business.

In fact, some of the low hanging towards the development of the non-wood forest products (NWFPs) and Artisanal mining (AM) in ASAL areas in the IGAD region require a value chain approach. In order to instaurate the value chain approach IGAD member states, at national level, should resolve the four challenges affections the NWFP and AM sub-sectors, as follow:

- (i) **Resource Inventories:** Carry out resource inventories to estimate the possible geographical distribution of the different NWFPs in the different member states.
- (ii) **Production challenges:** Capacity building of producers and labourers on modern production techniques to increase yield without endangering the environment.
- (iii) **Processing challenges:** Training of producers, traders and processors of quality standards, packaging and agro-processing techniques. Providing incentives such as quality-based price premiums would move a long way towards value chain development.
- (iv) **Marketing challenges:** Infrastructure of all sorts is a major challenge in ASAL areas of most IGAD countries. These infrastructural bottlenecks (e.g., inadequate transportation networks, non-existent storage facilities, energy and water supplies) significantly hinder development of bio-enterprises that are based on these non-wood forest products.

Other priority intervention areas include awareness creation, support to information sharing programmes, improved quality standards, support to enterprise development, technical capacity building, enhancing market access and promotion of investment in dry land product.

6.2 Key Recommendation to Further Development of NWFPs and AM Sub-Sectors

6.2.1 Resource Mapping of NWFPs at National Level in IGAD Member States

To date, no systematic attempt has been made so far to map these resources in IGAD member states. At the Regional Centre for Mapping Resources for Development (RCMRD) satellite data supported by ground truthing (verification) has been used to generate a forest type map, forest density map, non-wood forest products (NWFPs) map and a map showing total economic value (TEV) of selected trees in some areas of Kenya, Southern Sudan and Somaliland in Somalia. These efforts need to be systematically expanded to cover all key NWFPs producing areas in all IGAD member states and its economical potential.

It imperative that the key research and intervention areas, that will enhance natural resource management and conservation of biodiversity, are identified at the regional and national level.

On the other hand, all the associated social and economic costs and benefits of NWFPs sub sector have to be estimated at national level effectively, to better inform and assist the stakeholders and their future planning. It is also important the areas that need supportive policy and legal framework are identified the structures used to detect the need for institutional reform, in each of the member states, are triggered as appropriate.

The first two steps at national level could be the following:

- To promote commercial utilization of NWFPs and other natural resources, identification and mapping of the species with commercial potential should be the first step.
- The second step would be to conduct product development study for each specific product, at national level. This study would clarify the feasible exploitation and marketing of the resource with special emphasis on the knowledge, technology adoption, financial capability and availability of infrastructure of the area. Value addition and exporting new product may be too complex for pastoralist and pastoralist business institutions while private traders also may not interested to take risk at the start.

6.2.2 Promoting Artisanal and Small-Scale Mining

To modernize the artisanal and small-scale mining, it will be important for member states to implement the following recommendations:

- First, ensuring that policy and legal approaches on small scale mining are anchored within the broader national and regional context.
- Second, promoting an enforcement approach that ensures transparency and fairness in providing licenses, having stiff penalties on smugglers, encouraging women participation, enforcing regulations against child labor, and formulating and implementing laws on mercury management and establishing health and safety regulations.
- Third, encouraging an ecological approach that incorporates mining activities within the wider rural programs and ensuring a safe and friendly mining environment. Fourth, entrenching an educational approach by using environmentally sound technologies, supporting enterprise groups by for example providing funding and encouraging a saving culture among the miners.

Lastly, there should be effort towards ensuring the artisans and small scale miners access financial resources and lucrative markets.

6.2.3 Development of Incubation Centres

Non-wood forest products (NWFPs) and artisanal and small-scale mining (ASM) can compliment other sources of supporting livelihood systems in arid and semi-arid areas. However the privet sector and privet investment should strongly support these subsectors in order to develop and promote it.

Since many potential entrepreneurs, interested in NWFPs and ASM business opportunities, often do not have the appropriate working space or possibility to start up business out of their home. IGAD recommend using the Business incubation centers ³³ to facilitate the involvement of the privet sector in this area. It could also give the opportunity to rural population to start up their own business without a lot of funding or business knowledge.

In fact, an incubator centre is likely to be an ideal source of inspiration and guidance. Business incubation is a means of meeting a variety of economic and socio-economic policy needs.

The basis for incubation centers lies in the capacity to enhance the initiation survival and growth of enterprises. Successful business incubations should have a positive attitude to look for possible projects to be incubated, with the list of following requirement:

- Be feasible and have promising characteristics;
- The contracts and instruments to be used should be discussed and agreed upon;
- It should have a detailed analysis of the accounts and legal aspects in order to verify the fiscal and contractual situation of the proposed business;
- the business model of the new companies should be structured based on the interaction with investors and interested companies;

Even with successful implementation of incubation centers in some of the IGAD member states, there is need for evaluating the performance of incubation centers; analyzing some lessons learned from the national experience and sharing of information among member states.

33 Business incubation centers are meant to help such start-up businesses. The are usually provide office space and additional infrastructure cervices to their specific clientele.

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