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**Value Chain Analysis for Bamboo
Originating from Shedem Kebele, Bale Zone**

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CERTIFICATE

This is to certify that **Arsema Andargatchew** has worked on “**Value Chain Analysis of Bamboo Originating from Shedem Kebele, Bale Zone**” under my supervision. This work is original in nature and it is suitable for submission in the partial fulfillment of the requirement for the Degree of **Master of Business Administration**.

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Table of Contents

Chapter I - Introduction	1
1.1 Statement of the problem	3
1.2 Objective of the study	4
1.3 Significance of the study.....	4
1.4 Scope and limitation of the study.....	5
1.5 Organization of the paper.....	5
Chapter II – Literature Review and Conceptual Framework.....	6
2.1 Literature Review	6
2.1.1 <i>Characteristics of bamboo</i>	6
2.1.2 <i>Bamboo species in Ethiopia</i>	10
2.1.3 <i>Status of highland bamboo forests in Ethiopia</i>	14
2.1.4 <i>Value chain of Ethiopian highland bamboo</i>	16
2.1.5 <i>Policies and Actions taken by the Ethiopian Government</i>	22
2.2 Conceptual Framework	26
2.2.1 <i>The point of entry for value chain analysis</i>	28
Chapter III – Methodology	30
3.1. Bamboo species selection.....	30
3.2. Site selection.....	30
3.3 Questionnaire design and use.....	31
3.4 Sampling of chain actors	32

3.5 Time and other requirements to carry out the study	34
3.6 Personal motives	35
Chapter IV – Results and Discussions.....	36
4.1 Identification of study site	36
4.2 Value chain of bamboo originating from Shedem.....	40
4.2.1 <i>Shedem’s bamboo harvesters</i>	42
4.2.2 <i>Bamboo market in Goba town</i>	53
4.3 Interviews with other Stakeholders.....	68
4.3.1 <i>Government Institutions</i>	68
4.3.2 <i>Private Investor</i>	70
Chapter V – Conclusions and Recommendations	72
5.1 Conclusions.....	72
5.2 Recommendations	74
Bibliography	79
Appendices.....	82
Appendix I: Major Highland Bamboo Areas in Ethiopia	82
Appendix II: Population structure of Shedem	83
Appendix III: Questionnaires	84
3.1 <i>Bamboo harvesters survey instrument</i>	84
3.2 <i>Bamboo intermediary survey instrument</i>	89
3.3 <i>Bamboo product producer survey instrument</i>	91
3.4 <i>Bamboo products customers survey instrument</i>	95

List of Tables

Table 1 - General characteristics of the Ethiopian highland bamboo forests	12
Table 2. Number of employees in modern and traditional workshop and rented workshops in Addis Ababa	18
Table 3. Respondent categories	33
Table 4. Estimation of bamboo coming to Goba and Robe markets	37
Table 5. Interviewed bamboo sellers at Goba market.....	38
Table 6. Interviewees' statistics	44
Table 7. Amount and frequency of harvest per month	46
Table 8. Percentage of income from bamboo	48
Table 9. Seasonal fluctuation of bamboo in Goba market	52
Table 10. Amount of bamboo harvested by individuals.....	54
Table 11 Intermediaries in Goba market.....	56
Table 12. Number of bamboos bought by intermediaries	57
Table 13. Crafts made in Goba.....	60
Table 14. Bamboo products produced in Robe	61
Table 15. Consumers in Goba and Robe Markets	64

List of Figures

Figure 1. A simple value chain.....	27
Figure 2. The extended value-chain framework.....	28
Figure 3. Preliminary value chain map.....	39
Figure 4. Map of Goba woreda	40
Figure 5. Map of study site.....	41
Figure 6 Final value chain map	65

Abbreviations

BERSMP	Bale Eco-Region Sustainable Management Programme
BoARD	Bureau of Agriculture and Rural Development
CFC	Common Fund for Commodities
DA	Development Agent
EC	Ethiopian Calendar
EFAP	Ethiopian Forestry Action Program
EMA	Ethiopian Map Authority
FeMSEDA	Federal Micro and Small Enterprises Development Agency
INBAR	International Network for Bamboo and Rattan
KEFRI	Kenya Forest Research Institute
MoARD	Ministry of Agriculture and Rural Development
NTFP	Non Timber Forest Product
ODI	Overseas Development Institute
SNNPR	Southern Nations, Nationalities and People's Region
UNIDO	United Nations Industrial Development Organization

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Abstract

Bamboo is a highly utilised natural resource in many parts of the world. In Ethiopia, despite the availability of vast bamboo forests, the use is mainly limited to construction, fences, some rudimentary furniture and household utensils. Except for some general publications on value chain of bamboo in Ethiopia, there isn't much detailed work that will enable intervention at specific sites. Therefore, to understand the existing value chain and harness the bamboo potential as a means of alternative livelihoods through a well developed marketing strategy, the value chain analysis was carried out for Shedem Kebele, in Bale Zone.

The results show that communities in Shedem as well as the surrounding towns depend on bamboo resources highly. On average 47% of the annual income is estimated to be derived from bamboo sale for Shedem farmers. Further 17,000 – 23,000 bamboo culms are consumed on each market day in the Goba market. However, the bamboo culms are mainly used for construction and very little of furniture and crafts that are available do not satisfy the quality requirement of even the local community. The value chain studied was found to be very weak with little or no communication among actors.

Therefore, in order to efficiently use the available resource, it is essential to have a stronger and well coordinated value chain. For this to happen trainings at all level of the chain, organisation of farmers into groups, close collaboration with the private sector, proper management of bamboo forests and plantations and advocacy and marketing are required. Further, actors such as governmental and nongovernmental organisations should focus on development of the appropriate policy, research for value addition and establishment of information resource center.

Chapter I - Introduction

Bamboo is a highly utilised natural resource in many parts of the world. In Ethiopia the use of bamboo is limited to construction, fences and some rudimentary furniture and household utensils. Although bamboo is not an integral part of the Ethiopian economy, it plays a very important role socially, economically and ecologically in areas where it occurs naturally as well as where it is planted (Ensermu et al., 2000).

Wild bamboo grows with incredible speed and with great density per square meter (Kassahun, 2003). Therefore, bamboo is among the natural resources, if sustainably utilised, may provide sustainable finance to rural community.

Bamboo plants grow in tropical and temperate regions of the world, being more abundant in the former, particularly in Southeast Asia. According to Ohrnberger (1999), more than 1500 bamboo species are found in the world, covering more than 14 million ha of land. Out of these species, Africa possesses about 43 on over 1.5 million ha of land (Kigomo, 1988).

Ethiopia has two bamboo species: lowland bamboo, *Oxytenanthera abyssinica* – consisting 85% of the total bamboo forest in the country and highland bamboo, *Yushania alpina* (Ensermu et al, 2000). The total Ethiopian natural bamboo forest is estimated about 1 million ha, which is about 7% of the world total and 67% of the African bamboo forest area (Kassahun, 2003).

Due to its easy workability, highland bamboo in Ethiopia is used for fences, rafts, vessels for carrying and storing water, water pipes, splits for baskets, beehives, hats, mats, furniture, flutes, household utensils and agricultural tools. The lowland bamboo is mainly used for construction and fences.

The term value chain describes a business as a chain of activities that transform inputs into outputs that customers value (Pearce and Robinson, 2007). Thus, value chain analysis (VCA) tries to understand how customer value is created by businesses by analysing the contributions of different activities within the business.

Chain actors are those involved in producing, processing, trading or consuming a particular product. They include direct actors which are commercially involved in the chain (producers, traders, retailers, consumers) and indirect actors which provide financial or non-financial support services, such as banks and credit agencies, business service providers, government, and researchers (IIRR, 2006).

Taking the vast potential of bamboo resources and the huge amount of bamboo available in the country along with the considerable annual growth rate, this research tried to understand the potential of bamboo as a raw material and as products in the market by analysing its value chain. The research focused on the highland bamboo, due to its vast uses, and selected the Bale Mountains which is

identified as an area with the largest natural stand¹ of highland bamboo in Ethiopia covering 38.7% of the total highland bamboo area in the country (see Appendix I).

There are several bamboo forests in the Bale Mountains. For this study, the bamboo forest in Shedem kebele was selected after an observation was carried out at one of the largest bamboo market in Goba town. The observation showed that a large percentage of the bamboo coming to the Goba market is from Shedem kebele. Hence, seeing the high resource availability in the kebele and concerned with the sustainability of the consumption rate, the research was carried out in Shedem.

1.1 Statement of the problem

The Bale Mountains is cited in many literatures as the area covered with the largest highland bamboo forests. Despite this fact, the bamboo industry is not well developed and most of the products seen are at a very rudimentary level. Further, there isn't a clear indication of the value chains of bamboo culms originating from different sites. It is essential to understand how this system is functioning if bamboo is to be sustainably used to support the livelihood of the communities in the area. This study tried to address this issue by carrying out a value chain analysis of bamboo originating from Shedem kebele, in Bale zone.

¹ Natural Stand refers to pure natural forests

1.2 Objective of the study

This study attempted to explore the value chain of the Bamboo industry taking the case of Shedem kebele in Goba woreda. This was done in order to understand the existing chain and harness the bamboo potential as a means of alternative livelihoods through a well developed marketing strategy. The value chain analysis was carried out with the following objectives:

- To know the various uses of bamboo in the kebele;
- To identify stakeholders in the value chain and understand their link and level of involvement;
- To understand the demand for bamboo in the surrounding towns;
- To identify problems in the value chain; and
- To recommend strategies for proper management and utilisation of bamboo in Shedem and the surrounding area.

1.3 Significance of the study

Bamboo is estimated to be one of the untapped and highly valuable natural resources Ethiopia has. With its rate of growth, sustainable harvesting is possible with higher harvest as compared to other resources in the country. Therefore, proper development and marketing of bamboo products could assist in the quest for poverty alleviation in the country.

This research will be of immense value as it provides a detailed value chain of the bamboo industry originating from the highland of Shedem based on primary data. This will be helpful for any intervention planned by private, government as well as non-government programmes. It can be a starting document for other

similar studies of value chain analysis in different parts of the country and adds to the already existing literature on Ethiopian bamboo industry.

1.4 Scope and limitation of the study

The bamboo industry has a wider scope with varied dimensions. But for the purpose of this study the value chain analysis was given emphasis as it lays a starting point for any research on bamboo. Due to the limitation of time and resources, it focuses on the major actors of the value chain and concentrates on the highland bamboo of a single kebele, which excludes the other highland bamboo areas and completely rules out the richly available lowland bamboo. Therefore, this research must be applied taking the stated limitations into consideration. Understanding of the whole bamboo sector in the country requires a wider study than presented here. With respect to the stakeholders involved in the chain, the study examines the experiences and views of rural households, community elders, enterprise operators, urban dwellers as well as government representatives.

1.5 Organization of the paper

The paper consists of five chapters. The first chapter presents introduction, statement of the problem, objective of the study, significance of the study, and scope and limitation of the study. The second chapter consists the literature review and concepts and theories related to the area of study. The third chapter presents the methodology applied. The fourth chapter elaborates on the results while the last chapter discusses the conclusions and recommendations.

Chapter II – Literature Review and Conceptual Framework

2.1 Literature Review

Documents suggesting the high potentials of bamboo in Ethiopia have been produced since 1959 (Mooney) which suggested the use of lowland bamboo in Ethiopia as a raw material for paper pulp production in the Wellega region (now Benishangul – Gumuz). Similar suggestions were made by WoldeMichael Kalecha (1980) while the Ethiopian Forestry Action Program (EFAP) in 1994 proposed a “bamboo and reed research and development project”. Further, in 1997 LUSO consult was commissioned by the German Technical Cooperation (GTZ) to carry out a study on sustainable management of bamboo followed by a production – to – consumption study by Ensermu et al (2000). The Kenya Forest Research Institute (KEFRI) has also produced a guideline for sustainable bamboo use in 2007. In addition, a number of research on bamboo management and method for introduction of new species are being carried out at the Ethiopian Forestry Research Center. However, even though studies and recommendations on bamboo conservation and utilisation have been around for quite a while, changes in management and utilisation techniques are not visible on the ground. This section will give a review of the documents that were available to the author.

2.1.1 Characteristics of bamboo

There are more than 1500 known species of bamboo in the world (Ohrnberger 1999), of these, Africa has 43 species covering about 1.5 million ha (Kigomo, 1998). Forty of these species are distributed in Madagascar while the remaining 3 are found in mainland Africa (Ensermu et al, 2000).

Bamboo species grow naturally on the mountains and highlands of Eastern African Countries and in the medium lowlands of other African countries (KEFRI, 2007). Bamboo is one of the important Non-Timber Forest Products (NTFPs) sharing a number of characteristics with other NTFPs in terms of its renewability and accessibility to rural poor people (Ensermu et al, 2000). The uses of bamboo makes significant contribution to rural livelihood and employment, although the rapidly diminishing supplies of forest bamboo through indiscriminate clearing of natural forests and the lack of government priority in its development erode its status in East Africa (KEFRI, 2007).

Bamboos are tall perennial grasses with tree stature that grow up to about 30 m in height and 35 cm in diameter (Kassahun, 2003). According to Kassahun (2003) and Luso Consult (1997) the average length measured in the indigenous bamboo forests of Ethiopia is 16.9 m with the maximum size being 23 m in height and 20 cm in diameter and the minimum height being 11.1 m.

In a fully developed bamboo root system, which occurs within 3-7 years after seeding, new bamboo shoots are produced every rainy season and attain full height and diameter in about 3 months (Kassahun, 2003; KEFRI, 2007). Bamboos get mature, strong and ready for utilisation after 3-4 years (Kassahun, 2003; Wimbush, 1945; KEFRI, 2007). As mature culms grow older, they deteriorate and eventually die and rot. The life of a bamboo plant is however sustained by the new shoots and culms (Ensermu et al, 2000).

One hectare of the highland bamboo forest is estimated to carry an average of 6000 culms (Kassahun, 2003); whereas that of a lowland bamboo carries an average of 8124 living culms and 4185 dead culms (Ensermu, et al 2000).

It is generally recommended to harvest only the mature bamboo culms (3 -4 years and up) and up to 70% of the culms on a given surface. Effective bamboo management involves systematic but selective cutting of mature culms, thereby harvesting a crop that is valuable. The removal of mature culms also ensures the vigor of the plant and allows for generation of new shoots (KEFRI, 2007). On the other hand, clear cutting depresses the rate of recovery of bamboo after cutting (Wimbush, 1945 cited in Kigomo, 1998).

Most bamboo plants flower only once in their lifetime (14-50 years in most species) and then die soon after (Luso consult, 1997; Kassahun, 2003). They emerge again from germinating seeds if the site is not severely disturbed by detrimental factors such as rodents, fire etc. These phenomena were observed in the lowland bamboo forest of Pawe, South Western Ethiopia where the whole forest flowered and died in 1998 (Kassahun, 2003). But this is not always the same for all bamboo species (Luso consult, 1997).

Bamboo forests are characterised by a complex network of root system making them more efficient than other forest species in holding soil particles together (Kassahun, 2003). Therefore, bamboos are excellent in preventing soil erosion,

promoting water percolation, and in sheltering the soil from wind erosion and sun drying (Kassahun, 2003; KEFRI, 2007). Further Bamboo litter fall improves soil structure and fertility (Fanshawe, 1972) and is a material source for furniture, building, pulp, bio-energy, food, forage and medicine (Liese, 1985). It is a preferred material for various applications owing to its straightness, high strength, light weight, easiness of working with it, suitable fibre for pulp production and absence of bark (Suzuki and Jacalne, 1986). Bamboo shoot is of high nutritional value that can be used as source of food and feed (Ayre-Smith, 1963, Chaozong, 1995).

According to Kassahun (2003) Bamboos have the following limitations:

1. The gregarious flowering and eventual death of all bamboo trees in a forest is a characteristic that may seriously affect the sustainable supply of raw materials for bamboo-based industries;
2. Bamboo culm in storage and use is more susceptible to termites, insect borers and fungal attack than hard and soft woods, as it does not contain toxic substances unlike the latter species;
3. Bamboo culm preservation is less effective than most hard and softwoods because bamboo culm does not possess anatomical pathways which facilitate radial distribution of preservatives unlike in hard and soft wood stems. Moreover, culm skin are impervious and thus preservative penetration through them is limited;

4. A preservative method that is equally effective, cheap and safe as for hard and soft wood has yet to be developed;
5. The maximum attainable diameter is limited by their primary growth as they do not increase their diameter through secondary growth unlike hard and soft wood species.

2.1.2 Bamboo species in Ethiopia

The existing information about the distribution and coverage of bamboo in Ethiopia is rather limited. The study by Luso consult (1997) found that topographic maps of the Ethiopian Map Authority (EMA) miss some of the existing highland bamboo areas in Ethiopia; whereas highland bamboo areas shown on the maps prepared by Chaffey (1979) are far more complete but a bit more generalised than indicated in the EMA maps. Therefore, on a new general bamboo map produced by Luso consult, the highland bamboo areas from both Chaffey and the EMA maps were combined. In this regard, the total area of mapped highland bamboo (*Yushania alpina*) in Ethiopia is 129,000 ha. The highland bamboo area gives a good indication since these areas have been mapped quite accurately from aerial photographs. Since most highland bamboo areas are located in remote and inaccessible areas with a relatively low population pressure, it is assumed that the total highland bamboo area has not decreased significantly (Luso consult, 1997). See appendix 1 for distribution of highland bamboo in Ethiopia.

The total area of mapped lowland bamboo (*Oxytenanthera abyssinica*) on the other hand, amounts to 480,510 ha (Luso consult, 1997, Kassahun; 2003; Ensermu et al, 2000). However, this figure of lowland bamboo area is heavily underestimated and does not represent the real area, since a lot of spatial data are missing for this land cover type (Luso consult, 1997). WoldeMichael Kelecha (1980) estimated the lowland bamboo to be about 1,000,000 ha but according to Luso consult (1997), this figure is based on unverified assumption. Luso consult (1997) estimates area of lowland bamboo in north western part of Ethiopia between 200,000 and 350,000 ha which makes the estimation of lowland bamboo between 700,000 and 850,000 ha; though settlements may have reduced some of the bamboo areas.

Two important factors influencing the occurrence of bamboo in Ethiopia are rainfall and altitude (Luso consult, 1997). The highland bamboo grows in the central, southern, south-western and north-western parts of the country in an altitude ranging from 2200 – 4000 m asl. (Ensermu et al, 2000; Luso consult, 1997). The highland bamboo covers areas between the Bale Mountains, Bonga and Metu in the south and south-western part of the country and all the way to Dangla in the north (Ensermu et al, 2000). This species grows in montane forest, often on fertile, volcanic soils and forms extensive pure stands (Luso consult, 1997). The range of temperature where *Y. alpina* grows well is 10 – 20⁰c. Rainfall also influences the occurrence and growth potential of the species. In

Ethiopia its rainfall range falls in general between 1500 and 2000 mm and it is found as far north as 11°N and as far east as 40°E (Luso consult, 1997).

According to Luso consult (1997), generally in East Africa the species is in pure stand where rainfall is >800 mm/year; in under storey scrub bamboo where the rain is between 1000 -1200 mm and in bamboo / Podocarpus canopy mixture where rainfall is between 1200 – 1800 mm. The species is therefore a highland, low temperature demanding species, and requires high rainfall. Culms of the highland bamboo reach a height of 10 -18 m and a diameter of 10 -16 cm. Mean culm size in the low and highland bamboo forest is 5 cm and 7 m and 8 cm and 17 m of diameter and height, respectively (anonymous, 1997, sited in Kassahun, 2003).

Table 1 - General characteristics of the Ethiopian highland bamboo forests

Mean altitude	2200 – 3200 m
Mean annual rainfall	1950 mm
Total area	130,000 ha
Stand density (tree / ha)	6000
Percentage of dead trees	27
Culm	Hollow
Ratio of old to new shoots	5:1
Seeds	Most empty, not viable

Source: Anonymous, 1997; cited in Kassahun (2003). Ecological Aspects and Resource Management of Bamboo Forests in Ethiopia, Swedish University of Agricultural Sciences, Uppsala, p.12

Lowland bamboo on the other hand grows only in the western part of the Ethiopian lowlands along major river valleys and in areas bordering the Sudan (Ensermu et al, 2000). This species occurs between 700 – 1700 m asl with an average annual rainfall above 700 mm (Ensermu et al, 2000).

The flowering, seeding and dying of *Y. alpina* has been reported by Wimbush (1947) to occur in patches, not normally large. Sometimes this may extend to several hectares but no record of extensive flowering has been recorded. Observations in the field by Luso consult (1997) have confirmed this observation along with confirmation from local people around Masha area. Studies by Wimbush (1947) in Kenya on *Y. alpina* estimated that the life cycle of the species is more than 40 years. It is not however clear whether it is much longer or shorter in other places like Ethiopia where the species also grows (Luso consult, 1997).

Both the highland and lowland species are endemic to Africa, confined to the sub-Saharan region (Ensermu et al, 2000). These forests were until recently protected by their remote and inaccessible locations, however, they are now fast disappearing due to improvements in road networks and establishment of villages within and around the bamboo forests (Kassahun, 2003).

Bamboos are multipurpose plants of high economic and environmental value that convert solar radiation into useful goods and services better than most tree species. Developing countries like Ethiopia that are aspiring for better welfare

and faster rate of development, therefore, need to preserve their remnant bamboo forests and expand their resource base. They must also ensure the steady increase, stability and sustainability of bamboo forest production and utilisation activities (Kassahun, 2003).

2.1.3 Status of highland bamboo forests in Ethiopia

In Ethiopia, high proportion of dead biomass characterises the highland bamboo stands. According to Ensermu et al (1997), this may be attributed to a prolonged cutting cycle and low cutting intensity. According to Kassahun (2003) the remnant natural bamboo forests of Ethiopia are in a neglected state through lack of management. The condition of the Masha bamboo forest in Southwest Ethiopia was found to be a typical example by this study. The age structure of Masha bamboo forest was heavily skewed towards old trees and the annual litter fall (11t / ha) was larger than the current above shoot <1 year biomass (8t / ha). This natural forest was characterised by high percentage of mortality, 20% in the study done by Kassahun (2003) and 27 % in the study carried out by Luso consult (1997).

Kassahun (2003) further showed that about 73% of the 110t / ha total above ground biomass were from bamboo trees older than 3 years, which are mature for harvest. On the other hand, the share of new shoots (<1 year) was very small (7% of the total aboveground biomass). The Masha bamboo forest had a high percentage of dead trees, high stand density, high litter fall mass higher than aboveground shoot production which are all indicators of a forest in the process

of degradation for lack of management and timely harvest (Kassahun, 2003; Luso consult, 1997). Hence nearly all the culms are able to reach their full age, which lies between 10 – 15 years, after which they reach the end of their life cycle and the dead culms remain in bamboo stands, start to rot and finally collapse (Luso consult, 1997). Thus, the studies recommended the need to harvest / utilise some of the trees to reduce the stand density, improve the age structure and boost the productivity of the forest.

On the other hand, Injibara-kosober has a long tradition of managing bamboo and intensive use of *Y. alpina* (Luso consult, 1997). The predominant ethnic group is the Agaw people. Bamboo planting occurs in the area since about one hundred years ago. The reason for it is unknown but it was mentioned that the people started bamboo planting when the formerly existing natural stands were cleared for cropping (Luso consult, 1997).

Systematic and organised harvesting based on a management plan could improve dramatically the growing stock and bolster perpetual yield increment by reducing mortality and creating space for new recruits to emerge and grow. It is likely that bamboo forests of Ethiopia could only be conserved and developed if valued as useful crops. Thus, integrated management of their production and utilisation systems is recommended for their suitable conservation and development, as part of a strategy to remedy the deforestation-related problems of Ethiopia (Kassahun, 2003).

2.1.4 Value chain of Ethiopian highland bamboo

A value chain describes a range of activities required to bring a product from the producer to the consumer, emphasising the value that is realised and how it is communicated (ODI, 2006). The terms 'supply' or 'marketing chain' and 'production-to-consumption system' are also used interchangeably (ODI, 2006).

NTFP value chains may include a number of different activities from harvesting to cultivation of the resource, various degrees of processing, storage and accumulation at different points in the chain, transport, marketing and sale (ODI, 2006). In addition there are more tangential but less critical activities such as information gathering and provision, and capacity building that are part of the value chain (ODI, 2006).

In the 1900s, when vast areas of tropical forests were cleared of timber for local use and exportation, bamboos and other NTFPs were usually discarded or destroyed during logging operations (KEFRI, 2007). In the 21st century, however, there is a growing consensus that NTFPs are not only essential components of ecosystems but also invaluable to the livelihood of communities; NTFPs are known to generate substantial foreign exchange and are increasingly being regarded as valuable commodities around the world (KEFRI, 2007).

In Ethiopia, besides the vast area of natural highland bamboo stands, there are many places where highland bamboos are found in small plots on farmland next

to natural stands. According to Luso consult (1997), most of these plots are located in the south-western part of the Ethiopian highlands. However, despite the availability of bamboo, according to the research done on the production – to – consumption system of bamboo in Ethiopia, the use of bamboo resources in the country is sub-optimal (Ensermu et al, 2000). The authors identified two aspects that have resulted in this: (a). The supply of raw bamboo is rapidly diminishing both in terms of quality and quantity, and (b). Bamboo-based operations are confined to primary processing often using simple tools such as sickles and axes for own domestic consumption and at best, to rudimentary manufacturing of products for the limited local market.

According to Ensermu et al (2000) and Luso consult (1997), Bamboo processing and marketing in Addis is proliferating in recent years. Mainly two groups conduct the processing. The first group is traditional processors who came from Injibara or Kosober and settled in Addis Ababa that produce low quality products aiming at low-income customers; whereas the other group is modern workshops in Addis Ababa that are producing high quality products. The fact that people from Kosober migrated to Addis and other towns in order to start local production is pointing out that there must be an advantage to produce in the consumption centers instead of the raw material areas (Luso consult, 1997).

Forty-two private owned semi-modern and 16 traditional bamboo entrepreneurs' workshops are found in Addis Ababa. All workshops are scattered and found in

different places in the city. None of bamboo the entrepreneurs are registered in the trade and industry bureau of the city council (Eastern Africa Bamboo Project, 2007).

Table 2. Number of employees in modern and traditional workshop and rented workshops in Addis Ababa

Workshop type	No. Of employees		workshop	
	Male	Female	Own	rented
Modern	193	41	3	39
Traditional	82	-	-	16
Total	275	41	3	55

Source: Eastern Africa Bamboo Project, 2007: www.eabp.org.et

In the traditional bamboo processors from Kosober, the raw material is purchased from middle-men who buy the bamboo poles from the farmers. Craftsmen in Addis Ababa order truck loads of bamboo in Kosober and store them sometimes for several months in a rented place in Addis Ababa without shelter against rain and sun. Stools, sofa chairs, shelves etc are made exclusively out of bamboo with no use of other inputs like varnish or fixing material. Thus the only three cost items are the bamboo poles, the rent for the hired land and labour (Luso consult, 1997). The later one is a non cash expense because the members of the working groups are paid with the profit made by product sales.

According to Luso consult (1997), due to rudimentary working methods, lifetime of the products is short – not more than a couple of months. The major constraints for the traditional bamboo craftsmen are the high transport costs of raw material in the harvesting season when trucks are occupied with agricultural products, low quality of their furniture and lack of storage space. However, the main problem mentioned is the lack of working capital (Luso consult, 1997).

Regarding the modern shops, most shop owners get their raw material from Agereselam in Southern Nations, Nationalities and people's Region and prefer it to other raw material which comes from areas such as Hosaina, Shenen (160 km from A.A.) and Kosober because of its durability. The one from Kosober is said to be of low quality – cracks easily, not durable, output of culm low and color changes. All workshop owners previously were trained by those trained people by Chinese or Japanese or at the Federal Micro and Small Enterprises Development Agency (FeMSEDA) training centre. (Luso consult, 1997)

A research done in Injebara and Addis Ababa by Enserum et al (2000) showed that bamboo manufacturing units in both towns were generally micro-enterprises providing self-employment for owner operators and their family members. The result also showed that the majority of bamboo craftsmen work based on experience rather than proper training.

In some cases management capacities of the owners are very poor. They live on a day-to-day business with chronic shortage of working capital and lack of any type of bookkeeping (Luso consult, 1997). The very often stated working capital problems are based on a lack of management skills but also on their family situation.

All existing modern bamboo processing workshops are of recent creation opening starting 1994 whereas immigrants from Kosober started traditional bamboo processing in order to produce low cost chairs, shelves baskets etc in 1992 (Luso consult, 1997). Most of the craftsmen do not have enough working capital (3,000 – 5,000 birr) in order to buy a whole truck load in cash. Therefore, they have to get bamboo culms from *Mercato* from retailers to a considerably higher price.

Trade in bamboo raw materials and products in East African countries are extremely limited and fluctuate greatly from year to year. UN COMTRADE statistics (that lump bamboo and rattan together) indicate that Kenya exports the greatest value of bamboo and rattan products in East Africa, averaging US - \$1,463,000 for the period 1989 to 2000 inclusive, but that after a peak of over 3 million dollars worth exports in 1994 the figure has remained relatively steady at about US - \$800,000 per annum (Eastern Africa Bamboo Project, 2007). Of this approximately US 100,000 is exported to other East African nations.

Ethiopia did not export bamboo or rattan products between 1989 – 2000. The exception was a surprisingly large US 1.5 million dollars in 1998 all of which went to other East African nations (Eastern Africa Bamboo Project, 2007).

There is no large demand for bamboo culms in rural markets, and transporting them to nearby urban areas is not financially viable. Hundreds of hectares of natural bamboo forests in Metekel, Southwest Ethiopia, were left to decay on the site after flowering in 1997/98 for lack of adequate market for sale even at the cost of harvesting. Moreover, bamboo is considered as a perishable material susceptible to biological and physical deterioration. This perception has led to its neglect by the rural people as a useful renewable resource. The various technologies available to increase its service life are not practiced in the country and are not at all known by the rural communities. Knowledge limitations on its propagation, growth and utilisation have also contributed to the lethargy regarding its cultivation (Kassahun, 2003).

The research by Enserum et al (2000) concluded that the bamboo production- to - consumption system in Ethiopia is at its infant stage of development which is evident almost at every stage of the production and consumption process. Annual average profit margin of the vast majority of bamboo manufacturers in the survey areas was found to be less than the minimum government wage rate indicating the need for action in support of improved income from bamboo manufacturing.

In recent years however, there is an increase in bamboo business investment in Ethiopia. Two such initiatives are those of the Land and Sea Development – Ethiopia PLC (LSDE) and Adal Industrial PLC. In May 2006, LSDE obtained a five year, 136 million dollars contract agreement with a 99-year concession providing for the sale and delivery of dry raw bamboo from the Benishangul Gumuz State to pulp and paper mills in India (Statz et al, 2007). However, personal interview revealed that this company has changed its business direction to building a paper factory in Ethiopia due to the high export expenses faced. On the other hand, Adal Industrial PLC started operation of a bamboo factory in Dukum in March 2007. Being the first of its kind in Africa, this factory has marked a new era for bamboo products in Ethiopia (Eastern Africa Bamboo Project, 2007).

2.1.5 Policies and Actions taken by the Ethiopian Government

According to a research done by the International Network for Bamboo and Rattan (INBAR) cross national problems identified in Ethiopia and Kenya included policy restrictions on harvesting and /or transport, and a lack of a viable support such as centres of excellence where interested people could go for information, or training programmes (Eastern Africa Bamboo Project, 2007).

The Forest Development, Conservation and Utilization Proclamation No. 542/2007 of Ethiopia, does not have explicit statements on bamboo. However, among other species, bamboo is listed as species considered as tree in the proclamation.

According to EFAP (1994) the government of Ethiopia has given a priority for bamboo and reed research and development. There was a plan by the government to strengthen the management and use of the native bamboo and reed species. The programme focuses mainly on assessing the market for bamboo and reeds as raw material for export, manufacturing and marketing of artifacts, and the use in the paper and pulp industry. In the programme an extension service to the local communities would be piloted to promote improved bamboo and reed resource management and a sustainable supply of raw material. However, on ground implementations since this proposal have not been visible.

According to Kassahun (2003), the major causes that has led to the neglect, under-utilisation and destruction of the Ethiopian bamboo forests are: insecurity of land tenure right and lack of economic incentive to value them as useful commodities. All natural forests in Ethiopia belong to the state and the government lacks economic incentive and financial capacity to protect and manage them properly. The limited government attention is focused on natural forests from where timber could be profitably harvested for industrial use. Further, the document states that Bamboo forests are not even in the priority list of natural forests selected by the government for management and development. The lethargy of rural people towards bamboo forest development and management is again related to lack of incentive to obtain financial benefits from their sale.

Legal situation concerning bamboo use by the local population is somehow confused and suitable to some arbitrary interpretation (Luso consult, 1997). The lack of forest demarcation and management plans as well as the limited control possibilities by the local forest administrations convert bamboo in most cases to a no man's resource. In addition to this bamboo is not considered as an important resource by the local foresters (Luso consult, 1997); and commercial bamboo extraction and marketing is not regulated clearly, with the exception of the more or less arbitrary fixing of royalty rates (Luso consult, 1997).

In Ethiopia FeMSEDA is the one with the broadest experiences in bamboo. Experts from China started a handicraft training programme in 1975 (Luso consult, 1997). The training of trainers by the Chinese is until now the knowledge basis for nearly all Ethiopian bamboo handicrafts (Luso consult, 1997).

The governments in the Eastern Africa region have recognised the deteriorating situation and devised policies to encourage sustainable management of bamboo as a renewable resource. One of the options of increasing bamboo resource is through its domestication on farms. Farmers however need information to assist them to grow and manage bamboo because it is not a traditional agriculture crop in most of the African countries (KEFRI, 2007).

Various initiatives by non-governmental organisations in Ethiopia are showing the potentials of NTFPs. The government has also recently started to support such

initiatives by taking part in the Eastern Africa bamboo project. The project has the objective to promote the development of the sustainable production and use of bamboo products in East African countries with a focus on markets as the driving force behind such sectoral development. The project is funded by International Commodity Body of the Common Fund for Commodities (CFC), executed by the United Nations Industrial Development Organization (UNIDO) and supervised by the International Network for Bamboo and Rattan (INBAR). The major line ministries involved in the project execution are: Ministry of Trade and Industry (Ethiopia and Kenya), Ministry of Agriculture and Rural Development (Ethiopia) and Ministry of Environment and natural Resources (Kenya).

According to Kassahun (2003), a thorough and thought-out strategy that provide incentives to protect and use the remaining natural bamboo forests on a sustainable basis, and to establish bamboo plantations wherever they could have a protection and production function, is urgently required. The Ethiopian government needs to establish an effective institution to oversee these developments. It is crucial that the remaining natural bamboo forests have a rightful owner who could properly protect, manage and use them in perpetuity and enhance their value. Further, part of the remnant bamboo forests should be preserved for future generation without interference; this will enable future studies on the natural course of development in the absence of human-induced disturbances (Kassahun, 2003).

2.2 Conceptual Framework

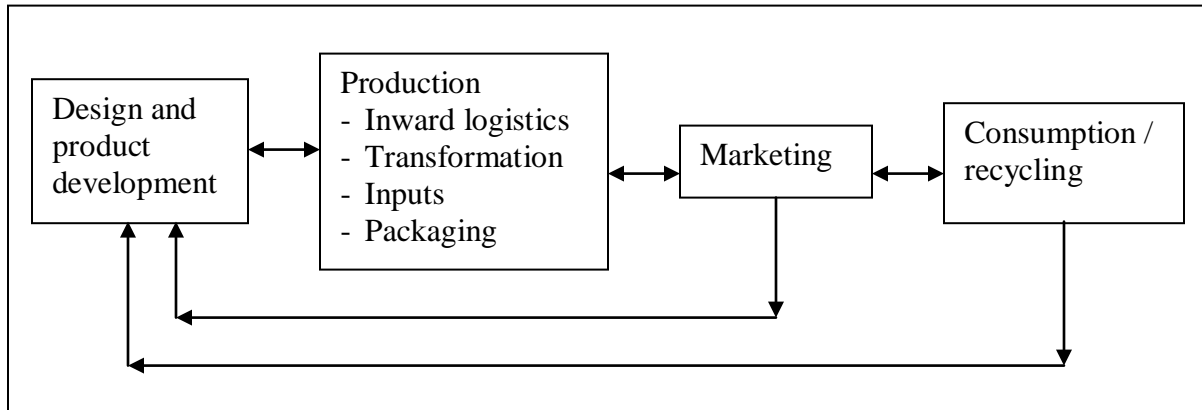
This section describes the conceptual framework for the selected method of analysis - the value chain, in order to give clear picture of the theoretical aspect.

According to Kaplinsky and Morris (2001), the value chain “*describes the full range of activities which are required to bring a product or service from conception, through the different phases of production, delivery to final consumers, and final disposal after use*”.

Further Pearce and Robinson (2007) explain value chain as “*a perspective in which business is seen as a chain of activities that transforms inputs into outputs that customers value*” and value chain analysis is described as “*an analysis that attempts to understand how a business creates customer value by examining the contributions of different activities within the business to that value*”. Thus, identifying each activity involved in the chain and the cost attached to each activity are essential steps in value chain analysis.

Value chain analyses may be viewed in two ways: the simple value chain and the extended value chain. As can be seen in Figure 1, a simple value chain describes a number of value added links and the activities within each link of the chain. The process is usually depicted in a vertical chain with intra-chain linkages that are two-way (Kaplinsky and Morris, 2001).

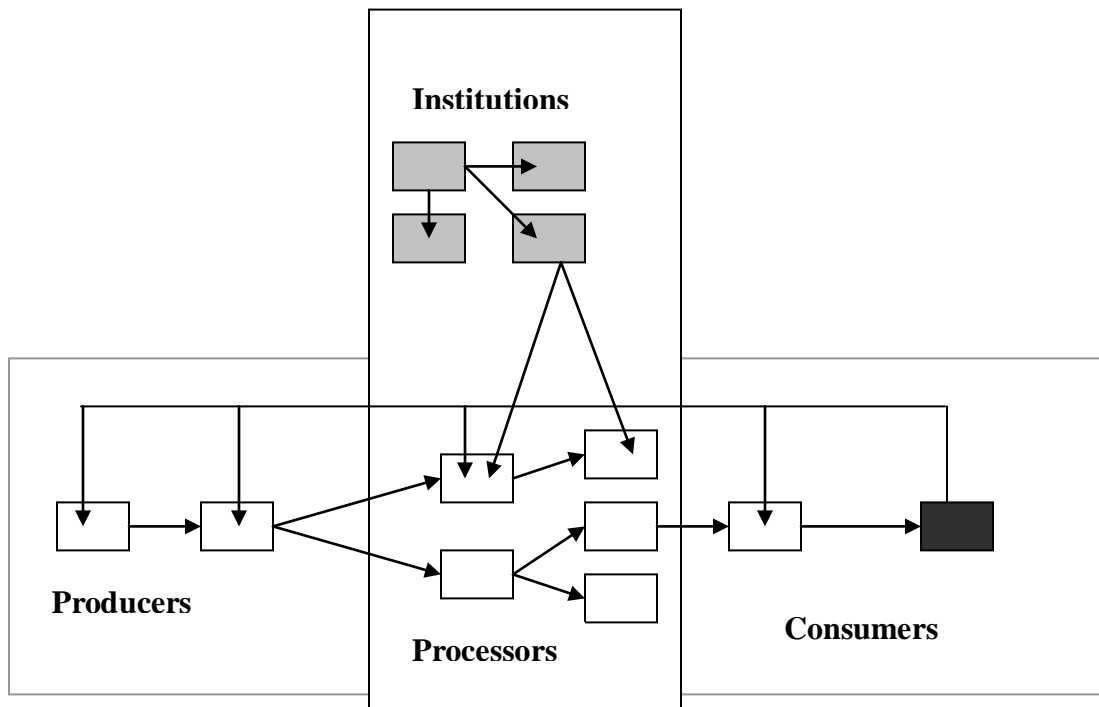
Figure 1. A simple value chain



Source: Kaplinsky and Morris (2001) A Handbook for Value Chain Research, IDRC.

When considering the real world however, value chains are much more complex than the simple chain shown above. Various stakeholders exist within a value chain and quite a few actors are involved at each stage of the value chain, which are found within complex inter-linkages (Stamm, 2004). Each stakeholder within the value chain contributes a value to the end product. This is the extended chain analysis which provides a more holistic understanding of the socio-economic environment most participants operate in, and allows for formulation of more integrated solution (Stamm, 2004). This model is more accurate in reflecting real life sub-sector processes than the simple chain model. Figure 2, shows an example of the extended model.

Figure 2. The extended value-chain framework



Source: Stamm (2004) Value Chains for Development Policy: Challenges for Trade Policy and the Promotion of Economic Development, GTZ.

Once the value chain analysis model is selected, there are a number of methodologies suggested by Kaplinsky and Morris (2001). Among these, for this particular research the point of entry for value chain analysis was carefully selected.

2.2.1 The point of entry for value chain analysis

As stated above value chains are complex and overlap with other chains. Therefore, researchers should be careful in identifying the chain (or chains) that will be investigated; for this, selection of the point of entry for the research inquiry is critical. According to Kaplinsky and Morris (2001), there are some possible

points of entry including: retailers, independent buyers, key producers, sub-suppliers, commodity producers, agricultural producers, small farms and firms, informal economy producers and traders and marginalised and exploited groups. Accordingly, the point of entry will define which links and which activities in the chain are to be the subjects of special inquiry.

Chapter III – Methodology

3.1. Bamboo species selection

As described in the introduction part, highland bamboo is used for various purposes by communities including construction, fences, water carrying vessels, baskets, beehives, mats, and hats. Therefore, due to its high social and economical use for various local communities, and to fulfill the objective of the study in recommending a viable strategy to create a profitable alternative livelihood, the highland bamboo was selected for this research.

Bamboo has started getting attention both from government and private investors. The government has started working closely with the international Network for Bamboo and Rattan (INBR) focusing in establishment of training centers, and private investors have started setting up factories (in Dukem town) and obtaining large tract of bamboo forests (in Benishangul Gumuz Regional State). Therefore, taking these opportunities into consideration the research was done in order to clearly understand the present value chain and assess the level of involvement both in commitment and profit for each chain actor.

3.2. Site selection

Site was selected based on (1) the availability of bamboo resources, (2) its potentials and significance to the surrounding community and (3) availability of implementing agency to carry out the recommendations of the research.

According to Ensermu et al (2000) the Bale Mountains have the largest area of natural highland bamboo stand (56,851 ha). Observations showed that the life of individuals in the area is highly linked with the use of bamboo. Further interview with community during observation at the Goba and Robe market revealed that the surrounding communities use bamboo from construction to household utensils. In addition, most of the community members from Shedem kebele rely on selling bamboo as an additional source of income. Finally, the Bale Eco-Region Sustainable Management Programme of FARM-Africa and SOS Sahel Ethiopia is keen to introduce sustainable livelihood options in the Bale Massif; and bamboo is among the priority options. Therefore, Shedem kebele was selected as it fulfils all of the above criteria.

3.3 Questionnaire design and use

Four semi-structured questionnaires were used. The first one targets community members at the research site who are involved in bamboo harvesting. The remaining three target the other chain actors (intermediaries, producers and consumers). (See Appendix 3).

To ensure a more holistic and complete understanding of the sector, the questionnaire for the community members incorporated livelihood questions. By extracting both qualitative as well as quantitative data about the socio-economic assets that chain participants held, a more accurate picture of the constraints as well as the strategy decision making process of chain participants could be

drawn. Qualitative analysis was also employed in order to try and assess the degree of strength (or weakness) in the relationships amongst chain members.

3.4 Sampling of chain actors

Communities in Shedem kebele were the focus of this research. However, an effort was made to incorporate all major chain actors in the sampling method. In total seventy-four /74/ chain actors were interviewed. Table 3 provides an overview of the respective position of respondents and the various locations at which they operate.

Purposive sampling was used to identify four settlement sites that are within fair traveling distance in Shedem. Simple random sampling was then used to identify households by using household list from the kebele's development agent data. However, there were many incidents where identified household individuals were not available and hence neighbors were interviewed. Other respondents in the Goba and Robe market were randomly selected and interviewed, while the private investor and government programmes were those identified by the researcher as relevant to this study.

This research adopted the extended value chain model in order to gain a more critical understanding of the sub sectors and for more integrated solution. It focused on the community bamboo harvesters and thus point of entry was selected to be the individual harvesters at the selected site. Further links and

functions were then investigated by departing from the harvester’s respective position, moving up and down the chain as necessary. To fulfill the stated objectives, data collected was analysed using descriptive statistics by tabulation, frequency distribution and description of facts.

Table 3. Respondent categories

Location	Respondents: number of cases					
	Bamboo harvester	Intermediary	producer	consumer	private investor	government programme
Addis Ababa	-	-	-	-	-	2
Dukem	-	-	-	-	1	-
Goba	10	9	12	5	-	-
Robe	-	-	10	5	-	-
Shedem	20	-	-	-	-	-
Total	74					

3.5 Time and other requirements to carry out the study

The researcher spent two weeks in the study sites (Shedem, Goba and Robe) in September 2007. Five days in Shedem and the remaining period in Goba and Robe, with full support from the kebele's development agent, the woreda natural resources team leader and staff members of the Bale Eco-Region Sustainable Management Programme. Transportation from Addis takes almost a full day as the road gets rough after the town of Shashemene (this is expected to change after few years as work has started on the road).

Since the local people mainly speak Oromiffa, a translator was required to carry out the study - the woreda facilitator for the Bale Eco-Region Sustainable Management Programme was assigned as a translator for this research. It is essential that the translator fully understands the purpose of the study for successful communication with respondents.

Shedem is a kebele that does not have access to transportation and hence horses / mules need to be arranged in Goba ahead of time. People in the area rent their horses for a price of 25 Birr per day. It takes at least 4 hours to travel by horse to the kebele which is beyond a very steep hill that needs to be crossed. No doubt that a person needs to be physically fit to travel to the kebele and survive the rain and cold weather. The friendly community members, the amazing landscape and the small cafeteria with hot tea and pastry, however, make the stay in the kebele very pleasant.

3.6 Personal motives

As an individual with a background in Biology and Environmental Science, the researcher is highly interested in the management of natural resources. The major motive to be an MBA student actually aroused from an interest in understanding business management systems that can equally be applied in the management of natural resources.

The researcher works for the Bale Eco-Region Sustainable Management Programme and is familiar with the various natural resources and livelihood issues that are being addressed. Bamboo is among the natural resources that are important part the livelihood of the communities surrounding the Bale Mountains. However, it is one of those resources with a lot of untapped potentials.

Therefore, the research is based on genuine interest in participatory natural resource management and enthusiasm in the possibility of applying the study practically.

Chapter IV – Results and Discussions

Value Chain Analysis of Bamboo products

4.1 Identification of study site

Observation was carried out in Goba and Robe markets since these are the two major cities in the area where bamboo trading is largely seen. Goba has bamboo market days twice weekly on Wednesdays and Saturdays whereas Robe has a weekly market on Thursdays. The observation was carried out to identify the origins of the bamboo culms coming to the markets, to identify the different chain actors involved in the bamboo trading and to design appropriate questionnaires for the study.

The first step of the study was to decide which market place to focus on – Goba or Robe. The size of the market was taken as a deciding factor. The observation was done on two market days (Wednesday and Thursday). Based on the estimation carried out by the researcher and the estimation given by government tax collectors at each market site, the Goba market was identified as the largest bamboo market place. As can be seen on table 4 the estimation of the two groups (researcher vs. tax collectors) differs highly. This may be attributed to lack of strict control by the government offices. However, for this purpose, the fact that both groups identified Goba's market to be almost twice as big as that of Robe's was enough for selecting the market site.

Table 4. Estimation of bamboo coming to Goba and Robe markets

Bamboo Market Site	Number of horses estimated per market day by researcher	Number of horses estimated per market day by tax collector
Goba	600 - 800	200 - 350
Robe	300 - 400	100 - 150

Once the market site was selected, interviews were carried out at the Goba market to understand the roles of individuals and where they have come from. This helped in identifying the different chain actors involved and places where the bamboo culms originate.

In the Goba market 10 bamboo sellers and 9 intermediaries were interviewed. Both groups confirmed that the bamboo sellers came from two different kebeles – Adaba Gefecha and Shedem. 80% of the interviewed sellers were from Shedem kebele (table 5) and all interviewed intermediaries estimated bamboo coming from Shedem between 80 and 90%. Therefore, since Shedem was found to be the major source of bamboo for the town, it was selected as the point of entry for the research. Based on discussion with different groups at the market place, questionnaires were designed (see appendix III) and preliminary value chain map was developed identifying the major chain actors (figure 3).

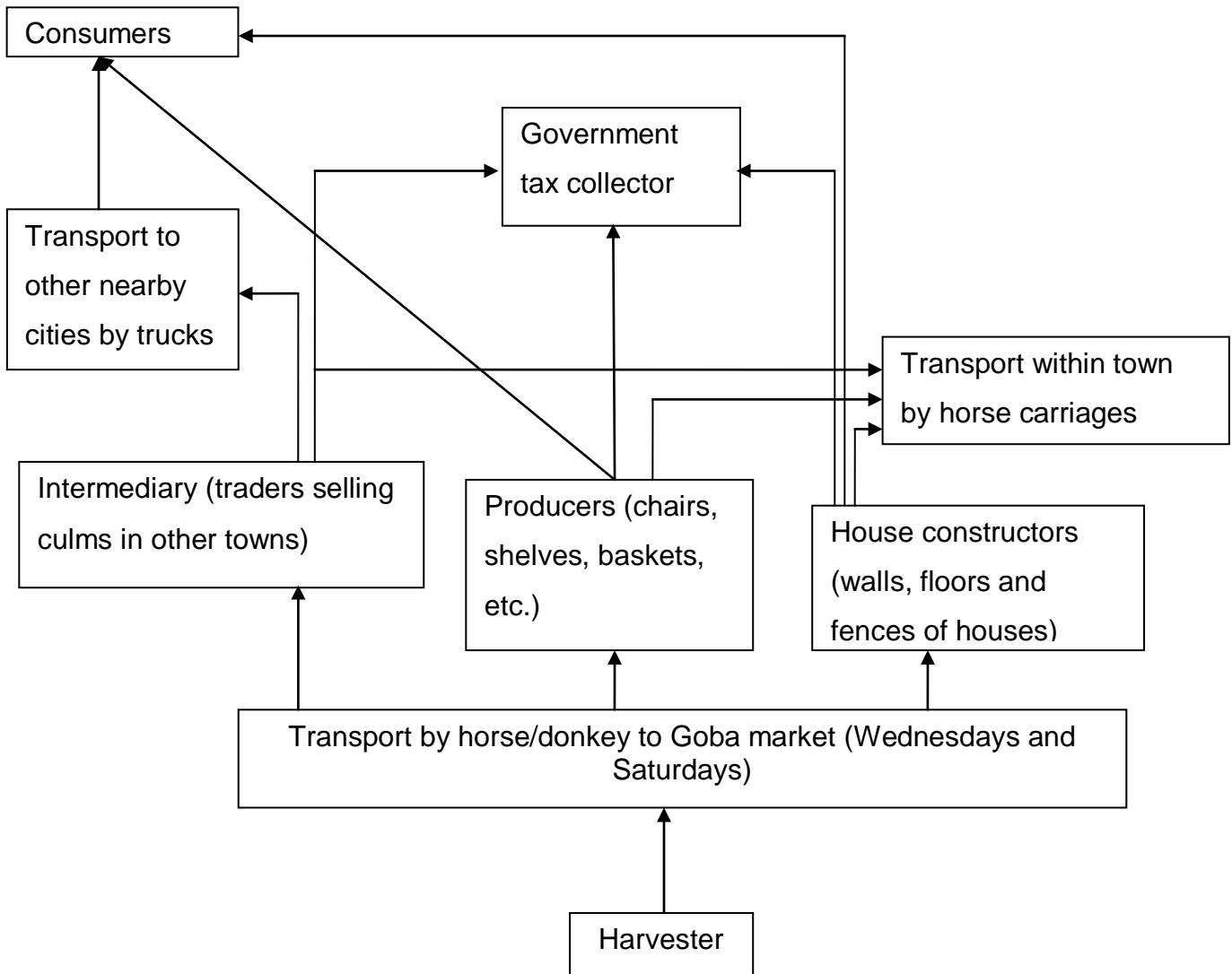
Table 5. Interviewed bamboo sellers at Goba market

No.	Name	Kebele
1	Anonymous(M)	Shedem
2	Abduljebar Hussien (M)	Shedem
3	Jelen Mamo (M)	Adaba Gefecha
4	Awel Haji Hassen (M)	Shedem
5	Kemal Aman (M)	Shedem
6	Jelan Kedir (M)	Adaba Gefecha
7	Hussien Mujahid (M)	Shedem
8	Geno Mami (M)	Shedem
9	Abdulkadir Aliye (M)	Shedem
10	Anonymous (M)	Shedem

Figure 3 shows Preliminary value chain map developed for bamboo originating from Shedem kebele after initial observation at the Goba Markets.

As can be seen in the Figure, initial observation revealed the chain actors to be: the harvesters, who are selling bamboo culms, the intermediaries and producers (furniture/craft and houses) who buy the culms, the consumers who buy the products, the transport providers, who take the culms of intermediaries to other towns and the government who collects taxes on bamboo culms. Each seems to be an important part of the chain even though their exact level of involvement is not yet understood.

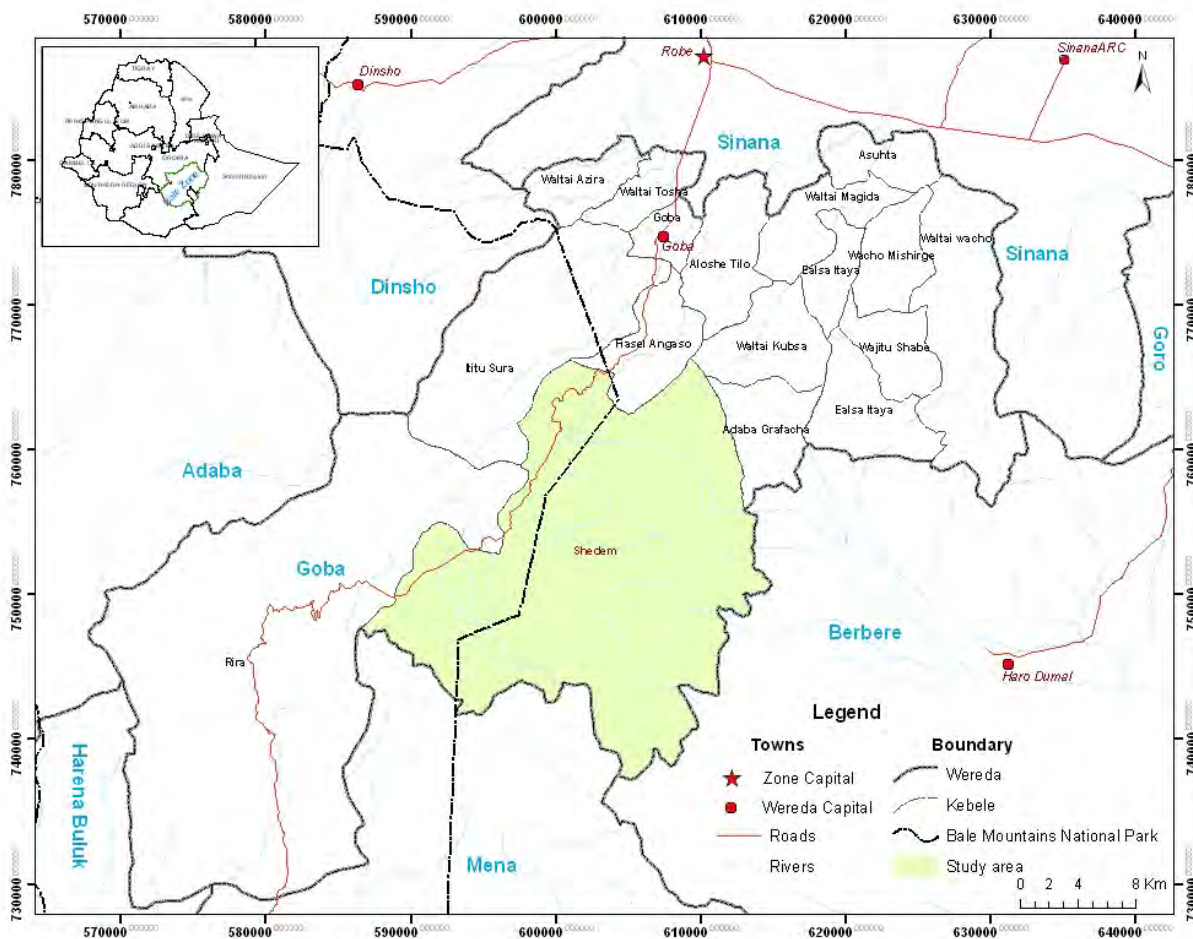
Figure 3. Preliminary value chain map



4.2 Value chain of bamboo originating from Shedem

The Bale Zone is found in the South Eastern part of Ethiopia within the Oromia Region. The Zone has nine woredas including Goba. Shedem is one of the 17 kebeles in Goba woreda. According to the data recorded by the Development Agent, the kebele covers an area of 47,237.7 ha of which 31,046 ha is estimated to be covered by forest. Of the total forest area 14,272 ha (46%) is estimated to be bamboo forest by the BERSMP, through interpretation of satellite images. The kebele has a total of 535 households with a total population of 2,870.

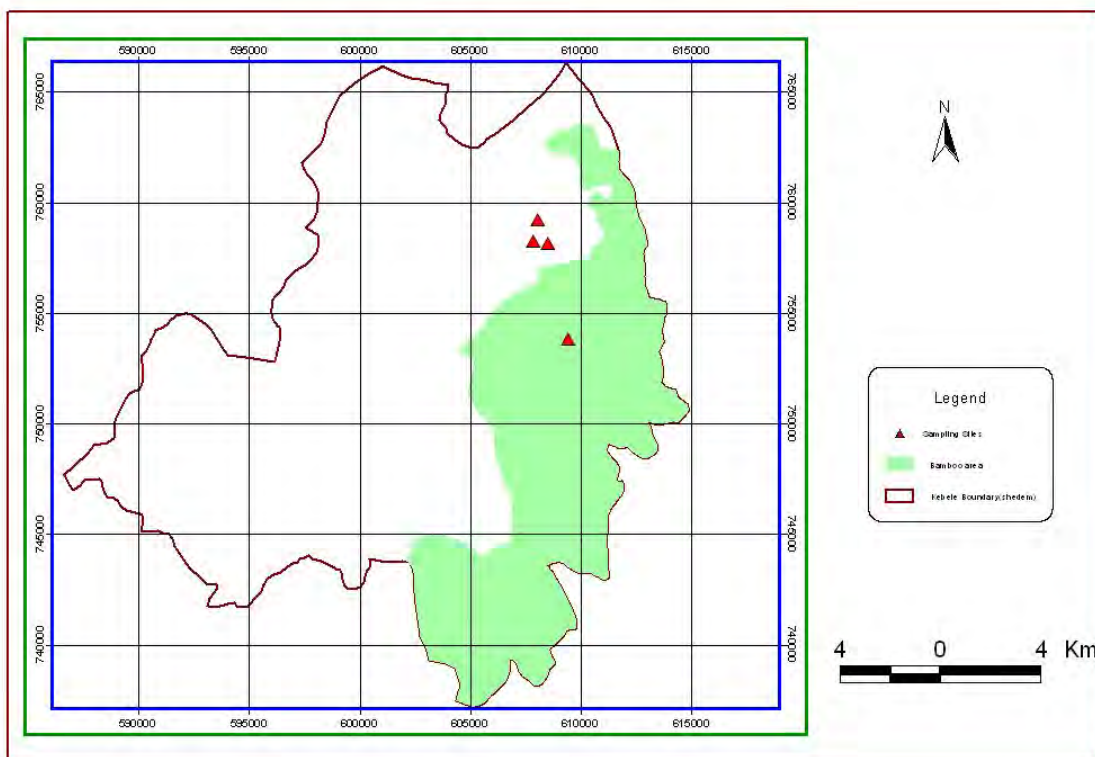
Figure 4. Map of Goba woreda



Source: Bale Eco-Region Sustainable Management Programme

As can be seen on figure 5 below, the bamboo stand in Shedem is found in the eastern part of the kebele. Being a very large Kebele with no transportation except for horses and mules, the sampling sites had to be limited. Therefore, with the support of the DA, 4 settlement sites were identified as sample sites (3 settlements that are close to the resource site and 1 settlement within the resource area). From each of the four selected sites, 5 households were randomly selected and interviewed by the researcher. Hence, a total of 20 households were interviewed at the kebele.

Figure 5. Map of study site



Source: Bale Eco-Region Sustainable Management Programme

4.2.1 Shedem's bamboo harvesters

Historical view points

Everyone in the kebele whom the researcher had talked to stated that bamboo has been harvested in the area as far as they can recall. Most young people think this has been going on for generations, elders of the kebele, however, recall a different story.

Three elderly people, (aged 60, 62 and 80) who were interviewed, recalled growing up listening to the story of the *Kimo-Argo* family who first started selling bamboo. The story states that this family started selling bamboo during early H/selassie regime. It had been a taboo to cut and sell bamboo before that, as bamboo was considered the king of the jungle, coming out covered with sheath that resembled a cloak. According to the interviewees, bamboo was only used for household purposes in early times.

However, the number of people selling bamboo increased slowly as people started recognising the benefit. Except for the oldest interviewee, who never harvested bamboo to sell, all other interviewees have been beneficiaries of income from selling bamboo. However, they stated that until this past couple of decades what used to be harvested for sell has been less than half of what is being harvested and taken to the market today. Today, according to all the

interviewees, bamboo has become one of the major means of livelihood for the kebele community.

Further, according to the elders, flowering has happened some fifty years ago (two of the elderly interviewees have witnessed it). According to them, first the leaves became reddish then it seeds. The seeds look like black barley and they remember people eating the seed by making bread and Porridge out of it; it was considered good food. Eventually everything dried up. They recall that the seedlings started growing back after a year but bamboo culms were not ready for harvest until 7-8 years later. People did not depend on it so much then, therefore, according to the interviewees, the impact was not very high, but if it happens now, they could not imagine how badly it will affect the livelihoods in the kebele.

Current status of bamboo harvesting

As can be seen in table 6 below, household size in the kebele ranged from 2 – 15 with an average of 6 family members. Large family size is attributed to the practice of polygamy in the kebele. The age range of harvesters among interviewees was 16 – 51 (table 7). Most people start harvesting in their twenties and do it well into their fifties or until their children take over. Both the large family size and large age range of harvesters call for caution as it could highly increase bamboo harvesting in the kebele with the increase in population. Fortunately, among the interviewees 80% were literate showing high potential for various trainings in development interventions.

Table 6. Interviewees' statistics

No.	Name	Age	Gender	School Grade	Marital Status	Size of household
1	Hassen Mohamud	16	Male	8	Single	7
2	Jemal Kedir	18	Male	5	Married	3
3	Abadir haji	18	Male	3	Single	6
4	Kedir Aman	19	Male	10	Single	2
5	Shemsiya Aliye	20	Female	illiterate	Married	3
6	Remla Awel	20	Female	5	Married	4
7	Mohamed Hassen	24	Male	7	Married	4
8	Shemsiya Mohammed	25	Female	4	Married	8
9	Kemer Haji Aman	25	Male	3	Married	5
10	Jelan Assefa	25	Male	4	Married	4
11	Hussein Yune	25	Male	7	Married	4
12	Kemal Tinika	30	Male	3	Married	3
13	Kedir Aman	35	Male	3	Married	4
14	Geno Mami	38	Female	illiterate	Widower	5
15	Abdulahi Kora	44	Male	3	Married	15
16	Haji Beriso Nebisso	50	Male	5	Married	13
17	Hassen Haji Jarso	51	Male	2	Married	10
18	Umer Abdurahiman	60	Male	3	Married	10
19	Mama Sheimu	62	Male	illiterate	Married	14
20	Kalo Harka	80	Male	illiterate	Married	5

It is incredible to see how much the communities depend on bamboo in the Kebele. From small things like utensils all the way up to houses are made of bamboo. Most of the bamboo harvesting and selling are done by men except for some exceptions:

- Women headed households who do not have sons old enough to do the harvest;
- At times when men are sick or away from home;
- At crop harvesting and sowing times, the men do the harvesting and the women or sons do the selling;
- Girls sometimes harvest bamboo to cover their school expenses; some collect the bamboo leaves and sell it for roofing.

After harvest, however, there is some gender division in household bamboo utilisation. Men usually build houses, fences, doors, beds, storages and beehives while women make utensils, shelves, fire sticks and air tube for making fire.

The amount of bamboo harvested by interviewed individuals varies from 48 to 2300 bamboo culms per month, with an average of 615 culms / month / person (see table 7). Harvest frequency also ranges from students who harvest only during school vacation up to those who harvest 8 times per month. The average frequency of harvest is 4 times per month.

Table 7. Amount and frequency of harvest per month

Name	Age	Number of years harvesting	harvest per month	Frequency of harvest/month
Umer Abdurahiman	60	30, now retired	1536	8*
Geno Mami	38	17	192	6
Shemsiya Aliye	20	Not harvesting, just moved to shedem	48	-
Kalo Harka	80	Harvesting not common in his time	-	-
Mohamed Hassen	24	6	1536	2
Shemsiya Mohammed	25	6	2304	2
Kemer Haji Aman	25	10	96	4
Remla Awel	20	Does not harvest, depend on farm	-	-
Kedir Aman	35	11	384	4
Jemal Kedir	18	5	576	4
Mama Sheimu	62	does not harvest any more	567	4*
Jelan Assefa	25	6	384	4
Abadir haji	18	1	288	2
Hassen Mohamud	16	4	67	0.33
Hassen Haji Jarso	51	30	768	8
Haji Beriso Nebisso	50	40, now retired	768	8*
Hussein Yune	25	7	288	4
Kemal Tinika	30	15	576	8
Abdulahi Kora	44	20, now retired	1152	4*
Kedir Aman	19	does not harvest, rents his two horses	768	8
Total			12298	81.33
Average			614.9	4

*Frequency is that of their children's as the individuals are currently retired

The different means of livelihood in Shedem include, farming, livestock rearing, coffee harvesting from nearby kebeles, beekeeping both in shedem and neighboring kebeles, vegetable gardening, bamboo selling, and renting of horses to bamboo harvesters (table 8). The average annual income of the interviewed households is 7747.00 Birr of which 47% (3711.00 Birr) is income from bamboo.

Of the 20 interviewees, only three households do not harvest bamboo. However, even among the three, one rents his horses for bamboo harvesters and hence gets income from bamboo (50% of what is gained from sale of bamboo culms transported by his horse) while the second one just moved to Shedem and plans to start harvesting soon. Therefore, only 1 household which represents 5% of the sample population does not depend on bamboo for income generation. Further, the interviewees estimated percentage of population depending on bamboo from 85 – 90%. When the group includes those renting their horses, the estimation went as high as 95%. This shows that the community highly depends on bamboo resources to support their livelihoods.

Table 8. Percentage of income from bamboo

Name	means of livelihood	Annual income in Birr	Annual income from bamboo	% of bamboo income
Umer Abdurahiman	Livestock, sheep, vegetables, farm and bamboo	13436	9216	68.6
Geno Mami	vegetable and bamboo	2382.4	1382.4	58.0
Shemsiya Aliye	bamboo, livestock, farm	7200	500	6.9
Kalo Harka	now depends on his saving - used to depend on farm, livestock and beehives	-	-	-
Mohamed Hassen	bamboo, farm, livestock, coffee, vegetable	23600	9600	40.7
Shemsiya Mohammed	Farm, vegetable farming, livestock, apiculture, bamboo	17728	11328	63.9
Kemer Haji Aman	farm, vegetable garden, bamboo	2960	960	32.4
Remla Awel	farm, vegetable garden, beehives, livestock	0	0	
Kedir Aman	bamboo only (just moved from Delo and do not have land)	3600	3600	100
Jemal Kedir	vegetable, hired to farm on other people farmland, beehives	6000	3000	50
Mama Sheimu	farm, vegetable garden and bamboo	6400	3400	53.1
Jelan Assefa	bamboo, vegetable garden, farm	2000	500	25.0
Abadir haji	vegetable garden, farm, livestock and bamboo	2000	300	15.0
Hassen Mohamud	farm, vegetable garden, livestock	2500	500	20.0
Hassen Haji Jarso	bamboo, farm, vegetable garden, beehives (in Delo and Shedem)	8260	5760	69.7
Haji Beriso Nebisso	beekeeping, farm, livestock and petty trader- buys coffee from delo, and barley from shedem and sells it when availability decreases	16000	5000	31.3
Hussein Yune	farming, beekeeping, bamboo, vegetable	8000	4000	50.0
Kemal Tinika	farming and bamboo	3000	2000	66.7
Abdulahi Kora	bamboo, livestock, farm, vegetable garden, beekeeping	4000	2880	72.0
Kedir Aman	farm and horse renting for bamboo harvesters	10380	2880	27.7
Total		139446.4	66806.4	851.1
Average		7747.0	3711.5	47.3

Harvesting mechanism and sustainability were assessed through interview as well direct observation at the resource site. When interviewed about harvesting culms, all seem to know that the bamboo culms need to be cut when they are old enough. They identify the culms that are ready by color – reddish brown. However, when asked the exact year that the culms will be ready for harvest most said starting the first year. Very few have said three years and up as indicated by literatures.

When asked about the sustainability of the harvest, many (80%) stated their concern. The reasons given by most include:

- Only one third of a culm is utilised when harvested for sell as per the demand in the cities. Therefore, one person cuts a whole bamboo, breaks it to three pieces and only takes one of the pieces while dumping the rest. Even though sometimes the remaining is taken to households to be used as firewood, they claim the majority just rots in the forest.
- When trying to cut culms from a clump of bamboo, most people damage the young ones trying to reach the old ones.
- Some harvest those that are not ready to harvest mainly because of lack of knowledge
- Young shoots are sometimes eaten by livestock
- Young boys cut off young culms and leave them to rot simply to show off.

The researcher was able to observe the resource site and has witnessed large number of bamboo culms dumped to rot. Also it was obvious that some very young culms were being cut for utilisation and damaged in the process of harvesting.

There is no bamboo plantation in Shedem. People fully depend on the natural bamboo stand for income. However, they think it will be a great asset if they can start planting now as the resource is decreasing. According to the interviewees, they never tried to learn the method of propagation because they never needed to have more than what is naturally available. But now, the resource is getting further and further away, people have to travel 3-4 hours depending on their settlement site to get to the resources. During the rainy season it takes longer as the road becomes muddy and almost impossible to travel even by horses.

Taking the 6,000 culms per ha estimate for highland bamboo given in literatures, and the 47,237.7 ha of Shedem's bamboo forest area estimated through satellite images, the total bamboo culms in Shedem is 283,426,200. To estimate the amount of harvest from this forest, the 615 culms harvested per person per month was taken into consideration along with the 467 male population in the age group of 19 – 60 in the kebele (see appendix II: age structure of Shedem kebele). Assuming 95% of the male population harvests bamboo, the total annual harvest from the Shedem is 3,276,720. This is only 1.2% of the total available culms. Thus, with the growth rate of bamboo, the current rate of harvest does not appear to be unsustainable. However, with the majority of the forest area being

far and hard to access, the concern might be on the relatively accessible sites where the harvesting activities are concentrated.

It should also be noted that there are other kebeles, including Adaba Gefecha, that border the bamboo forest (see figure 4 & 5). Hence, the rate of harvest is definitely more than what is stated above. However, since the majority of the bamboo harvest is observed to be in Shedem, this still does not cause alarm regarding unsustainable culm removal.

Bamboo culms marketing / distribution

The marketing system the community uses is very traditional. Hundreds of horses leave Shedem every Wednesday and Saturday starting 3 a.m. carrying culms of bamboo to Goba town. Horses start arriving at the market around 12:30 a.m.; and people unload their horses and select strategic spots to attract the early buyers. Horses arrive up to 10 a.m. but the peak hour is around 9 a.m. when sellers, producers and intermediaries are seen running around busy trying to get the best deal. There isn't much of bargaining at early hours, but around 11 a.m. more bargaining is observed since most of the good culms are gone and the buyers know that the remaining sellers will not go back without selling their culms.

The sellers explained that they have no bargaining power when the resources are in abundance. The intermediaries usually have the upper hand during this

time. However, when the resources get scarce in the market a higher price is set for the culms. Prices increase due to two reasons – farming periods and rainy season (see detail in table 9).

Table 9. Seasonal fluctuation of bamboo in Goba market

Months	Season / Activities in Shedem	Availability of bamboo culms in Goba Market	Price of culms
January – March	Harvest time	Decreases	Increases (up to 1.25 birr / culm)
April – June	Dry season	Increases	Decreases (as low as 30 cents / culm)
July – August July – October	Sowing time Rainy Season	Decreases	Increases (up to 1.25 birr / culm)
Nov. – Dec.	Dry season	Increases	Decreases (as low as 30 cents / culm)

According to the interviewees, harvesting is increasing at a faster rate and the price is also increasing. During H/selassie time they recall they carry 22 culms in one horse and they used to sell it all for 2 Birr. During Derg time the price increased and they sold 22 culms for 10-12 Birr; now they carry 24 and 48 culms depending on the sizes they harvest and they get an average of one Birr per culm. They associate this to the increased number of users in cities which increased the demand. This has attracted more community members to be involved in bamboo harvesting and selling.

4.2.2 Bamboo market in Goba town

The major chain actors identified in the market include the sellers, intermediaries, transporters, producers, consumers, and government tax collector.

4.2.2.1 Bamboo Sellers

The number of horses coming to the Goba market is estimated between 600 – 800 per market day; however, people from Shedem claim it could go as high as 1000 per day during the dry season. Each horse carries 2 bundles the total being either 48 of the thin culms or 24 of the medium culms. The thin part of the culm is what is mostly available in the market because of its high demand. Taking a ratio of 75:25 for the two sizes and assuming the medium and thin sized culms are obtained from the same bamboo culm, the amount of bamboo coming to Goba each market day is estimated to be between 21,600 – 28,800 culms! There is another group of communities coming from a neighboring kebele – Adaba Gefecha. They however represent few numbers and only 20% of the interviewee at the market site. Taking this into consideration, the total amount of bamboo coming from Shedem accounts for 17,280 – 23,040 per market day.

According to interviewees, most sellers come to Goba market once a week and on average about 138 culms are brought per person per market day (see table 10) and 552 culms / month / person. This is lower than the 615 culms / month / person estimation given at Shedem. This is assumed to be due to the fact that some of the harvested culms are used for household purposes in Shedem. Taking the previous calculation into account this will make 3-5 horses or donkeys per person (based on the 600 – 800 estimation).

Table 10. Amount of bamboo harvested by individuals

Name	Age	Gender	education	Kebele	number of culms sold per market day	number of market days attended per week
Anonymous	28	Male	6	Shedem	192	two
Abduljebar Hussien	21	Male	7	Shedem	144	one
Jelen Mamo	27	Male	5	Adaba Gefecha	108	two
Awel Haji Hassen	40	Male	illiterate	Shedem	192	one
Kemal Aman	18	Male	2	Shedem	240	one
Jelan Kedir	30	Male	4	Adaba Gefecha	96	one
Hussien Mujahid	15	Male	4	Shedem	96	one
Geno Mami	38	Female	illiterate	Shedem	120	one
Abdulkadir Aliye	30	Male	Illiterate	Shedem	194	one
Anonymous	35	Male	8	Shedem	96	one
Total					1382	
Average					138.2	

According to the sellers, what they get ranges from 30 cents per culm at bad times up to 1.25 birr during good times. The average buying price at the time of the research was 1 Birr / culm.

Value addition

The group harvests the culms and transports them from a remote resource site to a town where people can buy and use them. At this stage the harvesters have changed the bamboo resource that could have rotten away in the forest to a useable product. The community members are both harvesters and distributors of the bamboo culms and hence a very important chain actor.

Problems identified by sellers

The major obstacles cited are their lack of skills to add more value to the culms and the rough roads they have to travel both to the resource and the market sites. The sellers have expressed a need for training on use of bamboo culms not only for business but also for personal use.

4.2.2.2. Intermediaries

Intermediaries come from different towns around Goba. This group buys the culms from the Goba market and transports them to nearby towns to sell them with higher prices. According to the intermediaries interviewed and the tax collector, there are about twenty one regular intermediaries coming from different towns (table 11).

Table 11 Intermediaries in Goba market

Town intermediary is coming from	No. of Intermediaries
Gasera	3
Delo Sebro	1
Jara	10
Robe	7
Total	21

Nine intermediaries were interviewed for this study. According to the interviewees, the average bamboo bought by intermediaries ranges from 7947 – 9387 / month / person as shown in table 12. Taking the estimation of 21 regular intermediaries this makes the amount of bamboo bought by traders to 166, 887 – 197,127 per month. On average 182,007 culms (90% of the total that comes to Goba) are bought by intermediaries. All intermediaries agreed that they get good income out of bamboo but it is an additional income and not a primary job for all of them. It was learned that intermediaries buy bamboo from Goba (few also buy additional culms from the Robe market) and sell it in different towns including Robe, Agarfa, Gasera, Jara, and Ginir. In Robe the average price per culm is 1.10 Birr, whereas in towns further away the average price is 1.30.

The net profit reported ranged from 75 to 3200 Birr per month (an average of 835 Birr / month), this shows an average net profit of 2 birr per bundle (i.e. 24 culms). The associated costs that have been identified are transport, tax, storage, and loading and unloading.

Table 12. Number of bamboos bought by intermediaries

Name	Age	Gender	Min bamboo bought per month	max bamboo bought per month	Places where bamboo is sold	maximum net profit in Birr
Abraham Demissie	24	Male	4800	9600	Robe, Agarfa, and Gasera	700
Tolera Tibi	36	Male	1200	1200	Robe	75
Anonymous	34	Male	3840	9600	Robe	400
Jemal Shek Abdulhaman	35	Male	4800	7200	Robe	262.5
Belete Teshome	30	Male	5280	5280	Gasera and Jara	275
Jane Ketema	25	Male	9600	9600	Jara	250
Anonymous	40	Male	19200	19200	Ginir, Jara, and Gasera	2200
Endalkachew Belachew	25	Male	19200	19200	Gasera	3200
Habtamu Desalegn	22	Male	3600	3600	Goba and Robe	150
Total			71520	84480		7512.5
Average			7947	9387		835

Value addition

The group transports the culms to towns such as Robe, Agarfa, Gasera, Jara, and Ginir where bamboo culms are in demand for house construction (wall, floor and fences). The intermediaries' role at this stage is to distribute the bamboo culms further out.

Problems Identified by intermediaries

The two major problems identified by the intermediaries are that there is bamboo shortage during harvest time and that the culms coming to market are usually not all good since sellers bring many culms that are too young and damaged by insects.

4.2.2.3 Transporters

Those buying culms to be used in Goba and Robe use horse carriages. In addition to the transport service they provide, the carriage owners are also considered to be good in identifying the good bamboo culms both for individual buyers and intermediaries. They do up to 8 rounds of transport per market day carrying up to 25 bundles each time and charge 1 Birr / bundle. Thus they make up to 200 birr per market day on good days. Their expenses are about 10 birr per market day for carriage drivers and upkeep of the horses. When they assist intermediaries they are paid additional money by negotiation besides the transport fee.

Intermediaries going further away use Isuzu trucks for transporting the culms. The price depends on the distance traveled but it ranges from 400 – 600 Birr per trip.

4.2.2.4 Producers

For someone who is new in town, the houses of Goba and Robe catch the eye as they are fully covered by bamboo. There are a number of people leading their livelihood by making fences, walls and floors out of bamboo. Some are old and retired while others are young. Five were interviewed and all say they learned the technique from a family, friend or colleagues. They charge on average about 15 Birr / meter for making walls (1 meter takes about 20 culms) and 4 Birr / meter for fences (1 meter takes about 7 culms). Their income ranges from 200 – 700 birr per month depending on the amount of work they do each month. At this level, the average value of one culm is about 1.66 Birr.

Ten people have been found in Goba market selling bamboo crafts and furniture. Three of these were from Robe trying to sell their products in the Goba market. None of them originated from the bale area; they have moved from Injibara, Gojam. The designs they use are the ones they have learned in their town. They have moved to Goba and Robe because the demand is higher here as compared to Injibara and there is no one else with the required skills hence reducing competition.

The Group based in Goba does not make furniture but makes products such as baskets and beehives (see table 13). This group has 7 members. According to this group, the bamboo coming from a nearby town, Kofele, is the best for making these crafts as most are dry and ripe. However, since they do not have access to these culms, they use what is available in the Goba Market. The group

sell their products once a week during market day and income is just enough for their survival.

The only process they carry out is splitting the bamboo into pieces using a sickle and weaving them together to make the products.

As can be seen from table 13, more value is added at this level and more money is earned. The average price per culm at this stage is 6.6 Birr. However, as consumers stated quality of products are low and need to be improved.

Table 13. Crafts made in Goba

Type of product	Time to make each product	Number of products made out of 6 culms of bamboo	Prices
Basket for Injera	6-7 hours	3	13 birr/piece
Small breakfast table	3 hours	5	4 birr/piece
Beehive	6 hours	3	15 birr/piece
Basket for cloths	6 hours	3	18 birr/piece

The group from Robe works in a group of ten. They are hired for 400 birr per month. The bamboo coming from Shedem at present is not appropriate for this purpose (they required the whole bamboo culm) and hence they have a supplier that brings the bamboo to their place in Robe from Rira. Since they have started working they have not improved or changed their products since they have not received additional training. They sell their products both in Goba and Robe

Markets, people also drop by their shops sometimes. The most value added to the bamboo culms is at this stage. However, since the bamboo used by this group is not from Shedem, it is not part of the value chain that is being studied.

Table 14. Bamboo products produced in Robe and their prices

Type of product	Number produced per day	Prices
Chair	8-10 per day	25 birr/piece
Table	10 per day	25 birr/piece
Stool	15-20 per day	8 birr/piece
Bed	2 per day	80 -100 birr/piece

Value addition

This is the stage where the highest value is added to the bamboo from Shedem. The culms are turned into walls, floors, fences, and other crafts at this stage. The value of bamboo at this level is 1.66 Birr for houses and 6.6 Birr for crafts. However, the quality of the products is low while there is demand for better products from the local community. This shows that with the proper training, more value can be added to earn more income locally.

4.2.2.5 Consumers

Consumers interviewed stated that there is a constant increase in the number of bamboo culms that is coming to the market. Almost all relate the reason for increased harvesting to the increase in demand; and the demand has increased because:

- Other materials such as wood, cement etc are becoming expensive and people are increasingly using bamboo as structural framework for their houses, fences etc.
- Bamboo has a higher aesthetic value and can last for long years if done properly using ripe culms, thus the demand has increased – fences can stay up to 10 years and houses over 20 years.
- It is no longer customers from Goba and Robe at the market place, more and more intermediaries are taking bamboo to neighboring towns
- More community members in shedem and Adaba Gefecha have started recognising the income from selling bamboo.

Most of the culms coming from Shedem and sold at the Goba market are used for housing purposes in towns. This includes using the culm as structural framework for houses, using it as wall cover to protect mud-walls from down by constant rain, using it for fence and flooring.

Consumers of products such as baskets are increasing through time according to the producers. Consumers to the most part are not satisfied with the quality but buy the products because they are cheaper than other wooden products. In general bamboo products are not perceived to be quality products in the area (see table 14).

Problems identified by consumers

Similar to intermediaries, there is big complaint among consumers that the bamboo being brought by the farmers is not good anymore. More and more young culms are being brought to the market and thus the quality is decreasing even though the price is increasing from time to time. Consumers have also complained about lack of good furniture and crafts made of bamboo. Even though some are now available in the Goba and Robe markets, they do not think the quality is good enough.

Table 15. Consumers in Goba and Robe Markets

No.	Name	Age	Town	purpose of buying bamboo products / culms
1	Zewdu Ababu (M)	30	Goba	Buying baskets, it is cheap and looks nice though it won't last long
2	Birke Feta (F)	42	Goba	Baskets, looks nicer
3	Tasew Zenebe (M)	35	Goba	For wall and floor, it is cheaper
4	Birtukan Gurmu (F)	45	Goba	Breakfast table, it is cheaper
5	Hussein Mohammed (M)	38	Goba	For fence; cheaper
6	Anonymous (M)	20	Robe	Chairs, poor quality but cheaper
7	Feyesa Assefa (M)	33	Robe	Tables, very cheap
8	Anonymous (M)	27	Robe	Baskets, cheap and nice
9	Aliyu Kedir (M)	48	Robe	Tables, cheap
10	Anonymous (F)	24	Robe	Baskets, cheaper and nice

4.2.2.6 Tax collector

According to the tax collector, the procedure started during the Derg regime. The government collects 1 birr per bundle (0.4 Birr / culm) and it is the buyer that pays the tax. However, to reduce the tax, people have started placing more culms in a bundle – a bundle used to be 12 and now it is 24. This is affecting the government's income and has become a concern that needs to be addressed.

Figure 6 Final value chain map

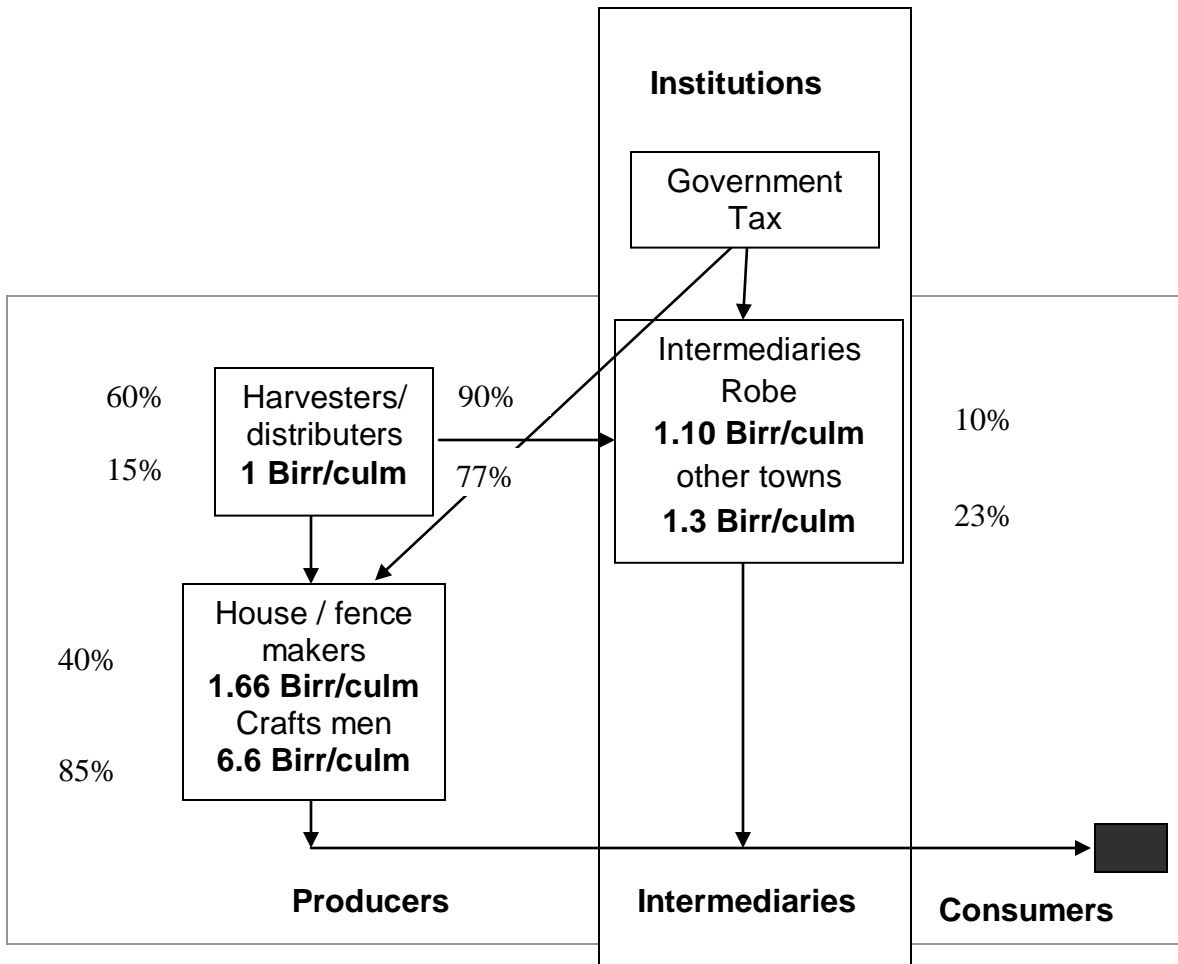


Figure 6, shows the value chain of bamboo originating from Shedem Kebele. Institutions are those that provide support to the value chain. In this case only government, in the form of tax collection is involved. Producers include the harvesters / distributors, craft and house makers. On the other hand intermediaries are of two type, one those that take the bamboo to a nearby town (Robe) and others taking the culms a bit further away. Based on this diagram, it can be seen that the highest value is added by crafts men. The value of bamboo at this stage is 85% of the value in that line. The second highest value level for

the culms is at the initial harvesting / distributing stage, which takes 90%, 77% and 60% of the total value along the various chains.

In the area however, other potential actors that can support the chain's development have been identified. BERSMP can facilitate the support of various institutions. Government partners whose involvement can add value include FeMSEDA in providing training, and Bureau of Agriculture and Rural Development (BoARD) in assigning development agents to incorporate bamboo in their development works. Adal industrial PLC and other new interested investors should also be worked with to identify appropriate point of intervention for bamboo processing.

Summary of findings

Bamboo is found to be of high value in the study area. The income from bamboo accounts for 47% of harvesters' total income indicating the need for focus on this sector. Further analysis has shown the involvement of various actors in this chain with intermediaries being the most important ones, buying 90% of the total bamboo culms coming to the Goba market.

Two major chains are identified in this case:

1. Farmers → Intermediaries → consumers; and
2. Farmers → producers → consumers

The chain actors' level of involvement was found to be weak as there is not communication among the actors. Sellers complain of not getting fair price specially when supply is high, intermediaries and producers complain about price getting high and quality decreasing and consumers complain of quality.

Identified problems in the value chain are:

- Lack of communication between chain actors - each work for maximum profit overlooking the quality issue;
- Farmers work as an individual rather than organised groups which could have given them more power to bargain;
- There is lack of skill both in harvesters and producers which contributes to the minimum quality and not much value addition to products seen in markets;
- Government is not fully involved which has created the view that government is there only to collect money and not to support.

4.3 Interviews with other Stakeholders

4.3.1 Government Institutions

4.3.1.1 Federal Micro and Small Enterprises Development Agency

The Federal Micro and Small Enterprises Development Agency (FeMSEDA) has a handicraft center which is the section working on bamboo. Interview with Ato Girma Diriba, General Manager of the Handicraft center revealed that the handicraft center has been functional for over 40 years. However, bamboo technology has only recently been recognized as an important economic sector both by the government and investors. The major activity of the center is giving training. There are products available for display and rarely orders are taken from customers. There are employees who get constant training from Chinese experts. These are the ones that provide the trainings to other customers. The manger stated that there is indeed high demand for bamboo products that are not being addressed. Being a government institution, the major attention is on training and they hope the trainees will be able to meet the high demand in the city. The center has also now bought a machine that will enable it to start training on advance stages of bamboo processing such as floorings.

In the year 1999 E.C., a total of 164 people have been given training in Amhara (Injibara), SNNPR (Hagereselam) and Addis Ababa by the center. The trainings are given on furniture making and handicrafts weaving. Training on entrepreneurship was also given in 2000 E.C. Customers are mainly individuals

in Addis Ababa who wants to get new as well as follow up trainings, regional states and NGOs.

Recently Ethiopia has brought seedlings from Kenya and the forestry research center is currently carrying out research on its potential in Ethiopia. These species are those that can grow on altitudes where the native bamboo species do not grow.

Trainings are given to all those that are interested. On average 3 month for field training and 4 month for Addis based training is estimated. Training in Addis costs 168 Birr /month / individual plus 5 birr registration fee.

In addition to displays at the center, there is also a house made of bamboo within the compound that is used as a training room. A staff member has explained the cost effectiveness of making a bamboo house (the one in the compound is of 56 m² and has taken 28 days to build using 27 individuals and the cost was about 800 birr/m²). This shows potentials of bamboo houses in Ethiopia.

4.3.1.2 Eastern Africa Bamboo Project

The project is implemented in Ethiopia and Kenya with an objective of technological skill improvement, ensuring sustainable bamboo supply and market availability. The implementing agencies are Ministry of Agriculture and Rural Development (MoARD) and FeMSEDA where MoARD is mainly responsible in

the development aspect whereas FeMSEDA focuses more on training/processing. UNIDO is the executing agency of the project.

An interview with Ato Melaku Taddesse, National Project coordinator revealed that the main activities are training and technical assistance. It is a four years pilot project and has been functioning for the past 2 years. It is expected to be expanded in a bigger scale after this pilot study. The three implementation sites are Hagere Selam, Injibara and Assosa at village level focusing on livelihood improvement. There are 50 beneficiaries at each village who are getting training on bamboo development (from planting to processing to marketing) including sustaining the raw material. Nurseries are developed for the organized groups and tools are available that can be locally replicated with FeMSEDA.

4.3.2 Private Investor

4.3.2.1 Adal Industrial PLC

Adal Industrial PLC is currently the only bamboo industry in Ethiopia. The industry started operation on March 2007. An interview with Ato Adane, General Manager, has revealed that the industry has some contact with FeMSEDA, Eastern Africa bamboo project, and INBAR.

The industry produces floorings, curtains, tooth picks and sandal sticks. The factory has a capacity to consume 1000 – 1500 culms per day. Culms are accepted from individuals or community members that can deliver the required type.

The factory has the following criteria for accepting bamboo culms:

- The bamboo culms have to be of at least 3 years of age
- It has to be fresh - a max of 10 days after cutting by the time of delivery to the factory
- diameter has to be more than 10 cm

The products are available for local market. However, there is no outlet yet but demands can be given directly to the factory. There is also a prospect to start exporting the products.

Community members can strike a deal with the industry to bring bamboo regularly. Including transportation the factory may pay 7 birr per culms. There is very low waste as they have started experimenting with charcoal. Also the byproducts are said to be very good for weaving and the industry is willing to give it to other groups based on a deal. The communities near Dukum town provide the supply currently.

The bamboo curtains are sold for 87 Birr / m² or 104 Birr / m² depending on quality. The flooring is 3 Birr / m². The factory has about 64 employees currently and is the first of its kind in Africa. According to the general manager, Bamboo products properly produced are strong and can be given guarantee for up to 20 years.

Chapter V – Conclusions and Recommendations

5.1 Conclusions

Ethiopia has the largest bamboo resources in mainland Africa. However, the exact size of the resource is not known, except for the widely accepted 1 million ha estimate. There are small individual bamboo plots on farmlands that have not been included in inventories because of their patchy nature. Further, too little is known about the rate at which bamboo resources are being cleared to make way for agricultural or any other land use.

Despite the vast bamboo resources available in the country, the contribution of the sector to the national economy is very low. There is no adequate data on value of the sector's contribution to GDP; engagement in bamboo export trade so far is almost non-existent. However, private investments have started showing the increased awareness of bamboo potential in Ethiopia.

The use of bamboo in Shedem ranges from household use to trading in order to generate income. Houses and fences in Shedem are made of bamboo just like beds, beehives, and grain storages. Further 85 – 95% of the communities are estimated to rely on bamboo business with an average of 47% of their income being derived from it.

The demand for bamboo is high in Goba and the surrounding areas. This is obvious with the number of customers seen in the bamboo markets and the fast

sell of the raw bamboos. It is obvious that the current consumption will increase with increased population and decreased availability of wood and rise in price for materials such as cement. Unless properly managed this could result in an unsustainable harvesting of the bamboo resource both in Shedem and in other surrounding kebeles.

The highest value point for bamboo was found to be where the most value is added (crafts level). However, this sector does not provide the needed quality or amount. Therefore, intervention at this point could prove to be worthwhile

There is high demand for bamboo materials and furniture in Shedem, Goba and Robe. In Shedem people are keen to learn making such furniture for their own use whereas consumers in Goba and Robe demand for quality furniture to be available in markets. The high demand shows that there could be lucrative market for bamboo if quality is improved.

Policies that give due attention to NTFPs including bamboo need to be available and should encourage the sustainable use of these products by communities. Promising initiatives are being undertaken by government institutions, NGOs and the private sector. If all work in conjunction for a bigger impact, more economical benefit may be obtained from bamboo. The bamboo factory that has recently established shows the high potential of bamboo for the Ethiopian economy.

Since the availability of bamboo resources alone will not be of any good, concerted actions need to be taken by fully involving all chain actors. Considering the high potential of bamboo products, the necessary trainings, tools and spaces should be made available with the support of the government and other non-governmental organisations.

5.2 Recommendations

Based on the study, the author suggests the following recommendations:

Know the size of bamboo resource

The exact condition of the bamboo in shedem is not clearly known. With the vast area covered with bamboo, it is possible that large areas of intact bamboo are available. However, with the current harvesting system and amount of extraction the area needs to be studied closely. It is suggested that bamboo experts from centers like the Forestry Research Center be approached to do a quick resource assessment.

The amount being extracted from Shedem currently is large. However, a very large gap has been seen between the estimates given by the government tax collector and the researcher. Therefore, it is recommended having another independent counting done at different seasons and different market days to decide the average number of culms coming from Shedem. This will enable us to understand the true economical value of bamboo in the area.

Establish bamboo plantations

Propagation of bamboo is essential if more people are going to be involved in its utilization. With the complaints from the Shedem community, it was obvious the resource is not as abundant as it used to be. Therefore, homestead bamboo plantation and agroforestry need to be encouraged. Further it will be essential to establish a nursery for the community group for sustainable propagation system. It has been learned that other communities within the bale massif successfully propagate bamboo in their homesteads. Therefore, a simple community –to – community visit may be a good start.

Training

Training is essential at all levels of the value chain if bamboo is to become a sustainably utilized natural resource. Most of the farmers who harvest bamboo were found to be literate and hence training will not be a problem. Suggested initial trainings are:

- Sustainable harvesting and bamboo propagation training for farmers in Shedem;
- Production of better quality bamboo products to producers, including bamboo culms preservation methods;
- Customer oriented production systems; and
- Systematic marketing both for bamboo culms and products.

Establish a community based organisation

If the farmers are going to be fully involved in the value chain, it is essential that some sort of an association is created. This will make them more powerful in bargaining for price, makes it easier for them to take trainings, they can pull their resources together and improve their infrastructure specially the road to the resource site, they can become a strong link in the chain and provide better quality culms, and they can work with other organizations in a more coordinated way.

Establish contact with private investors

with the presence of BERSMP, it is easier to establish contact with private business organizations. Bamboo being more known for its potentials at this time, more people will be interested to invest. Therefore, it will be good to start contacting potential investors who will be interested in establishing factory or small enterprises and work closely with the community.

Initially, the contact may start with Adal bamboo factory, and striking a deal to deliver the required culms. However, before getting into such deal, the above suggested bamboo assessment should be carried out.

Advocacy and Marketing

Bamboo products are perceived as poor quality products that will not last long by consumers. This is due to lack of workmanship as well as lack of awareness of

some of the quality products. Along with improvement of the products, advocacy on the quality of products and its environmentally friendly quality should be widely understood by the general public.

Further, to promote and market the products displays, showrooms, trade fairs exhibitions etc need to be used.

Involve in studies to explore alternative bamboo products

Various bamboo products are produced in many other countries. It is time for Ethiopia to start experimenting on the various products and learn the potentials of the bamboo species available in the country. Among the potentials are development of bio energy, charcoal, pulp, paper, scaffoldings and casings for construction. Government institutes along with the support of other organizations should initiate these experiments. BERSMP should also be involved in such initiatives and collaborate with private investors as well as government institutions such as FeMSEDA.

Establish an information center

One thing farmers lack is information. The BERSMP can establish this not only for bamboo but for other NTFPs in the area. With farmers coming to town at least twice weekly, it is easy to establish such a center in Goba town. The center may provide market information, sustainable management systems etc.

Lobby for policy that supports the use of bamboo by community groups

There is no clear indication on how bamboo or any other forest resources can be used by community groups. However, communities are still using the bamboo resources in their surroundings. In order to give use right and security over the use of the resource, a strong policy lobbying is essential.

Establish a stronger chain that is co-owned by the actors

All the above recommendations will lead to strengthening the value chain. A chain that is well developed with actors that communicate with each other for better products will result in a good and lasting business.

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Appendices

Appendix I: Major Highland Bamboo Areas in Ethiopia

Bamboo Area	Region	Natural Stand (Ha)	Plantation (Ha)	Total Area (Ha)	% coverage
Injibara	Amhara	30	2350	2380	1.6
Agaro	Oromiya	-	1500	1500	1.0
Bale Mountains	Oromiya	56851	-	56851	38.7
Jibat	Oromiya	1774	2561	4335	2.9
Gera	Oromiya	36000	1250	37250	25.3
Bore/ Hagereselam	Oromiya	-	2460	2460	1.7
Chencha / Arbaminch	SNNPR	2460	3250	5710	3.9
Indibir / jembero	SNNPR	-	1850	1850	1.3
Jima/Ameya	Oromiya / SNNPR	-	900	900	0.6
Mizan Teferi / Kulish	SNNPR	-	1850	1850	1.3
Debresina / Wofwasha	Amhara	35	-	35	0.0
Wushwush / Bonga	SNNPR	-	1120	1120	0.8
Bonga / Ameya	SNNPR	7997	-	7997	5.4
Masha	SNNPR	18652	-	18652	12.7
Munesa Shasheene	Oromiya / SNNPR	4183		4183	2.8
Total	-	127982	19091	147073	100.0

Source: Ensermu et al, (2000). The Socio-Economic Case Study of the Bamboo Sector in Ethiopia: An Analysis of the Production-to-consumption system, Addis Ababa.

Appendix II: Population structure of Shedem

Age group	Male	Female	Total
1-7	476	447	923
8-18	475	434	909
19-60	467	524	991
>61	12	35	47
Total	1430	1440	2870

Source: Shedem Kebele Administration

Appendix III: Questionnaires

These questionnaires are going to be used by the student to fulfill the requirement for an MBA degree by assessing the *value chain of bamboo originating from Shedem kebele*. The objectives of the study are: to know the various uses of bamboo in the kebele; to identify stakeholders in the value chain and understand their link and level of involvement; to understand the demand for bamboo in the surrounding towns; to identify problems in the value chain; and to recommend strategies for proper management and utilisation of bamboo in Shedem and the surrounding area. Any information that the respondents require to be kept confidential will be so done.

3.1 *Bamboo harvesters survey instrument*

1. Interviewee Name _____
2. Age and gender _____
3. Level of education _____
4. Marital status _____
5. Location (kebele, woreda etc.) _____
6. What is the size of your household _____
7. Are you linked to any particular association/ coop? _____
8. Do you know how long people have been harvesting from this area?

9. How long have you been harvesting bamboo for? _____
10. How much / how often do you harvest per year?

11. Who does bamboo harvesting in the area (men, women, children)

12. Who sells the harvest? _____
13. What are your other means of livelihood? _____
14. Can you estimate your total income from last year? _____
15. What percentage (or amount of money) was the income from bamboo

16. Do you harvest from the wild or do you have a plantation of your own?

17. If you have a plantation how big is it? _____
18. What method of propagation do you use? _____
19. For plantation, what inputs do you use (seedling, labour etc.)

20. Are the inputs readily available for you? _____
21. Interviewee position in the chain (harvester only, harvester and producer, etc.) _____
22. To whom do you primarily sell you bamboo (local consumers, distant markets, intermediaries etc.) _____?
23. Do you keep some for home use? If yes what do you make with it?

24. For those using intermediaries – have you ever considered selling bamboo to other markets directly? Why / why not

25. Do you know for what purpose your bamboo is being bought? (Local use, some processing for sell in other cities etc.) _____

26. Please describe bamboo on your own word? _____

27. Describe the process of harvesting

28. How much did you harvest last year and how much of it was sold for?

29. How much time do you spend on harvesting each year?

30. How much of your harvest is used for commercial use, for household use and goes to waste? _____

31. How do you set prices for buyers? _____

32. For how much do you, on average, sell a bamboo culms _____

33. Do you think it is a good price or not? Why? _____

34. What do you think are the factors that determine the price you get the most? (Seasonality, bargaining power, lack of market information, lack of transport etc.) _____

35. Is there any price changes information that you follow?

36. Do you have access to credits? How do you become eligible for such loans? _____
37. Where will you rank bamboo in terms of profitability when compared to other means of livelihood that you have? _____
38. Who manages the bamboo income in the HH? Any specific expenses that you usually cover from your bamboo income?

39. Do you make bamboo products or just sell the culms? Why?

40. If you make products what do you make? _____
41. How is the quality of the products? Have you ever received any training? If yes on what, by whom and when?

42. Do you think you need more training? _____
43. What is the biggest obstacle that you face as a bamboo producer

44. How do you think this obstacles be resolved

45. If the possibility would be there, would you be willing to produce bamboo products on a much larger scale and quality? _____
46. In general would you say that producing bamboo products is profitable than selling the culms? Can you tell me examples?

47. Have you ever received any sort of support from the gov. or any other organization in regards to bamboo? What type? Was it effective?

48. How is your relation to other chain actors (input suppliers, intermediaries, government, NGOs, exporters, local customers)

49. Do you in any way collaborate with other bamboo producers in your community? Other local organizations, NGO etc?

50. Where do you want to see yourself in regards to bamboo production in few years time? _____

51. If opportunities arise, what kind of support do you need to realise your wish? _____

3.2 Bamboo intermediary survey instrument

1. Interviewee Name _____
2. Age and gender _____
3. Level of education _____
4. Marital status _____
5. Location (kebele, woreda etc.) _____
6. Address, telephone if possible _____
7. How long have you been in this line of business? _____
8. How do you select the culms you buy? _____
9. Can you describe the type of culms producers demand?

10. Do you have individuals you buy from regularly or not?

11. Where else do you buy the bamboo culms from?

12. How many do you buy per year? _____
13. What is your profit per Culm? _____
14. Where are your customers based?

15. How do you transport the culms to the destination? _____
16. How much does the transport cost? _____
17. Are there any other costs associated with this business?

18. Is this your only means of livelihood or not? _____

19. How do you describe the market you have now? Profitable, subsistence
etc _____

20. How do you get your customers? Through personal contacts, etc?

21. Do you know what materials are produced from the culms you collect and
sell? _____

3.3 Bamboo product producer survey instrument

1. Interviewee Name _____
2. Age and gender _____
3. Level of education _____
4. Marital status _____
5. Location (kebele, woreda etc.) _____
6. Address, telephone if possible _____
7. How long have you been in this line of business? _____
8. Do you have intermediaries bring culms to you or do you buy them yourselves _____
9. If you buy them yourselves please list the places where you can buy culms from _____
10. If you are using intermediaries, do you know where your culms are coming from? Please state.

11. How many traders do you have regularly bringing bamboo to you?

12. How much do you pay for each Culm you buy?

13. Are the prices usually fixed or do they fluctuate? If they fluctuate do you know the reason? _____

14. Are there specific types of culms that you need to make your products? If yes please describe.

15. Do you buy culms regularly or do you buy and store them?

16. If you store them are there any protective methods you use to make sure they stay fresh? _____

17. How did you start making bamboo products?

18. Have you ever received any form of training? If yes, what kind of training, if no why not?

19. Do you know where you can get training? If yes please state

20. What are the products that you make?

21. Have you been changing your products through time? How?

22. Is this your only means of livelihood or do you have other occupations as well? _____

23. How long does it take you to make each product?

24. What are the tools that you use to make the products?

25. Are all the tools that you need readily available? Where do you buy them from? _____

26. What is the cost of your tools _____

27. Can you describe the process you go through to make the products?

28. How many people do you have working with you? _____

29. Are they trained? How? _____

30. How much do you pay for each labor? _____

31. Can you list all your other costs in making the products?

32. Do you have a workshop or do you make the products in your house?

33. Where do you get the designs for your products?

34. What are the products that are in demand at this time?

35. How do you assess the demand?

36. Do you have products with different quality or are they all the same?

37. Do you try to improve the quality? Why? Why not?

38. How much do you sell each of your products for?

39. Do you sell your products to consumers or to shop owners? Why?

40. How do you market your products? _____

41. Is the bamboo market good at this moment? Describe

42. If you sell it directly to consumers how do you classify them? (low class, middle class, high class, foreigners; young, old; men, women; educated, not educated etc) _____

43. If you are selling it to shops can you provide contact addresses for them?

3.4 Bamboo products customers survey instrument

1. Interviewee Name _____
2. Age and gender _____
3. Level of education _____
4. Marital status _____
5. Location (kebele, woreda etc.) _____
6. Address, telephone if possible _____
7. How do you perceive bamboo products? (Poor quality products bought only because of low price, medium quality products, good quality, environmentally friendly etc.)

8. How do you find the price of bamboo products? Too high/ too low/ ok etc

9. If quality is improved will you be willing to pay more? How much more?

10. Are there products you want made out of bamboo but are not available on the market? Please list _____
11. Are bamboo products easily available or are they limited to few shops that are hard to find? _____
12. Do you have any comments, recommendation regarding bamboo products? _____

Declaration

I, **Arsema Andargatchew Tesfaye**, declare that the study entitled “**Value Chain Analysis of Bamboo Originating from Shedem Kebele, Bale Zone**” is the result of my own effort in research undertaking. The study has not been submitted to any Degree or Diploma in any college or university. It is submitted for the partial fulfillment of the requirement of the Degree of Master of Business Administration.

Arsema Andargatchew Tesfaye