

Environmental Policy Update 2013:
Missing Players in Environmental Governance

**Chapter 4. Economic and Environmental Implications of Non-Timber
Forest Products: A Study of Shea (*Vitellaria paradoxa ssp. nilotica*) in
Gambella, Ethiopia**

Marie Abrahams & Lizzie Anderson

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Environmental Policy Update 2013: Economic and Environmental Implications of Non-Timber Forest Products: A Study of Shea (*Vitellaria paradoxa ssp. nilotica*) in Gambella, Ethiopia

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- This research examines opportunities for expanding shea production and markets in the Gambella Region.
- Case studies reveal two models of successful shea commercialization: (i) leverage investment from international private companies, and (ii) attract investment from non-profit organizations.
- These two models share four key steps for expanding access to national and international shea value chains: forming a structural basis, establishing a project niche, increasing and improving production, and contributing to community benefits.
- Shea is a valuable and accessible resource with local demand in Gambella.
- The Gambella Region could develop shea value chains by considering the following factors for a potential cooperative:
 - Partner with private investors or NGOs for market access
 - Focus on regional markets followed by international markets
 - Consider social and environmental limitations during planning, and continue research on resource availability, production limitations and opportunities for expansion.
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Chapter 4. Economic and Environmental Implications of Non-Timber Forest Products: A Study of Shea (*Vitellaria paradoxa* ssp. *nilotica*) in Gambella, Ethiopia

Marie Abrahams & Lizzy Anderson

EXECUTIVE SUMMARY

Shea (*Vitellaria paradoxa*) is a non-timber forest product (NTFP) native to the Sahel region of Africa. The resource is also of great environmental, economic, and social value to communities surrounding its native habitat. The highly nutritious shea nut, known across Africa for its healing qualities when converted to shea butter, has a growing international market among cosmetic industries and cocoa processors. However, increases in shea production and exports in recent decades have been concentrated in West African countries. The limited data on shea production in East Africa - specifically in Ethiopia - suggest that shea may be an underdeveloped resource.

This paper explores opportunities for expanding shea production and increasing domestic and international marketing opportunities with a focus on the Gambella Region of Ethiopia. Specifically, this paper asks *how might the Gambella Region strengthen its shea value chain and how might increasing shea production impact the environment, the incomes of rural communities, and the ability of local cooperatives to gain entry into global markets?* We synthesize existing scholarship on shea production patterns in the Gambella Region and explore possible opportunities to increase the value of this resource through case studies of successful shea operations in Ghana and Uganda. Additional analyses, which include Geographic Information Systems (GIS) analyses of data generated through previous shea studies and an analysis of primary household survey data in the Gambella Region, provide additional insights into shea availability, shea uses and production potential.

Case studies of successful shea commercialization elsewhere in Africa suggest two models for expanding access to regional and global shea value chains: (i) leveraging investment from international private companies, and (ii) attracting investment from nonprofit organizations for the development of shea production infrastructure. These examples further suggest that financial support, the capacity to expand markets, and prioritization of community benefits are important factors enabling the success of shea cooperatives in international markets. GIS analyses show a belt of known shea stands through the center of the Gambella Region with dense shea habitats at the core of the region and more scattered shea habitats in the northern and southern areas. These habitats also tend to be generally accessible from major roads, indicating the availability of this resource to select villages in the region and suggesting viable locations for shea production. Finally, survey results from one shea-producing village in rural Gambella indicate that shea use is widespread, that shea contributes substantially to the household incomes of rural communities, and that households are willing to dedicate significant time and energy to the production of shea.

Findings from case studies, GIS analyses, and survey results suggest that shea is an available resource whose production and market can sustainably expand in the Gambella Region. Although the region faces several environmental, social, and economic limitations to production, strengthening shea value chains with institutional support from private investor partnerships or NGO sponsors could improve access to domestic, and eventually international, markets, maximizing the value of this resource for local communities.

Chapter 4. Economic and Environmental Implications of Non-Timber Forest Products: A Study of Shea in Gambella, Ethiopia

Marie Abrahams & Lizzy Anderson

1. INTRODUCTION

Shea (*Vitellaria paradoxa* ssp. *nilotica*) is a non-timber forest product (NTFP) native to the Sahel region of Africa for which the market is growing rapidly, fueled by increased international demand among cocoa and cosmetic industries (UNDP, 2010). As of 2008, total shea nut production in Africa was estimated to be approximately 600,000 tons, of which 350,000 tons were exported, for a total export value of \$149 million U.S. dollars (Reynolds, 2010).

In addition to the international market value, studies across Sub-Saharan Africa have concluded that shea is a valuable environmental, economic, and cultural resource for rural communities surrounding its native habitat (Reynolds, 2010; UNDP, 2010; Djossa, 2007; Elias, 2007). Environmental benefits associated with shea production include increased soil fertility and improved microclimates for crops in agro-forestry settings (Teklehaimanot, 2004), habitat conservation in areas prone to deforestation (UNDP, 2010; Djossa, 2007), and the potential for carbon sequestration (UNDP, 2010). In addition to these valuable ecological roles, shea also accounts for over 50% of household incomes among producers in top producing countries such as Mali and Burkina Faso (Konate, 2012; Teklehaimanot, 2004). From a social perspective, shea is also an important source of income and empowerment for women, since females traditionally lead harvests, processing, production, and sales (The Shea Project, 2012; Elias, 2007).

In recent decades, expansion of shea production and exports has been almost exclusively concentrated in West Africa, particularly in Burkina Faso, Mali, and Ghana (Reynolds, 2010). But the distribution of shea in Africa spans a distance of 5,000 kilometers, including 19 nations from Senegal to Ethiopia, which receive 600 to 1500 mm of rainfall each year (Figure 1)

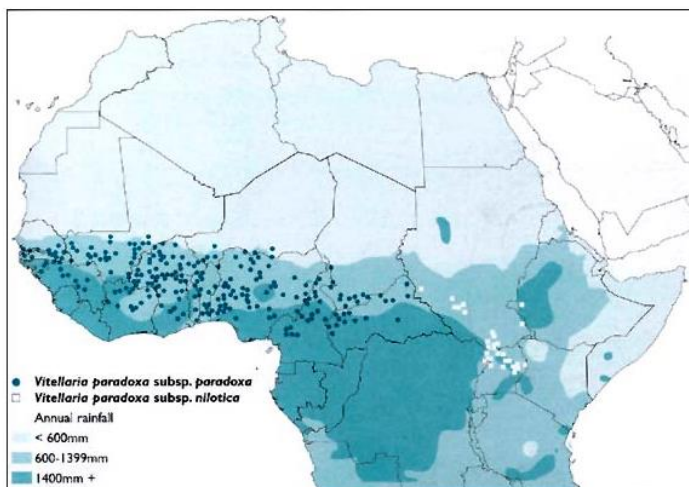


Figure 1. Distribution of *Vitellaria paradoxa* (points) as a function of rainfall (shading) (www.fao.org)

(UNDP, 2010). Unfortunately, there is limited data on shea production in eastern Africa, specifically Ethiopia. A study conducted by USAID and the West Africa Trade Hub (WATH) estimated that Ethiopia's total potential shea production in 2004 was 1,000 metric tons, while actual production was only about 100 metric tons, all of which was used for domestic consumption (Lovett, 2004). This suggests *Vitellaria paradoxa* may be an under-utilized resource in Ethiopia today.

This paper explores the potential value of shea in Ethiopia by evaluating opportunities for development and expansion of regional and international shea value chains. We begin with the following overarching research questions:

- What are the social, environmental, and economic values of non-timber forest product production in rural developing communities?
- Specifically, how might the Gambella Region strengthen its shea value chain and how might that impact the environment, the income of rural communities, and the ability of local cooperatives to gain entry into global markets?

This paper intends to investigate the potential of shea production and expansion in the Gambella Region of Ethiopia. It focuses on domestic and regional policies as well as other factors associated with entry into international trade and marketing opportunities.

2. BACKGROUND

2.1. The Shea Tree

Shea trees are slow-growing (Figure 2), taking approximately 15 to 20 years to reach maturity, and have a lifespan of 200 to 300 years (Djossa, 2007). The trees yield a highly nutritious nut (Figure 3) that is typically processed into butter for cooking and medicinal purposes in producing countries (UNDP, 2010; Teklehaimanot, 2004). The shea subspecies that grows in Ethiopia, *Vitellaria paradoxa ssp. nilotica* is reputed to generate a higher quality butter¹ than West African varieties (Gwali et al., 2012); however, the overall quality and quantity of *Vitellaria paradoxa* harvests tend to be highly variable (Gurmu, 2009).



Figure 2. The shea tree (www.alaffia.com).



Figure 3. Shea nuts (www.allstarhealth.com).

Women typically harvest shea during the rainy season from June to September (Elias, 2007). The production process from shea nuts to butter is labor intensive and requires many days for

¹ Quality refers to higher quantities of olein, a compound contributing to shea's therapeutic qualities, as well as a strong fragrance and smooth texture (The Shea Project, 2013).

shelling, drying, boiling or smoking, and hand grinding the nuts with a mortar and pestle until the texture is refined (Ojoba Women’s Shea Cooperative, 2013; Elias, 2007). In some cases, cooperatives of shea producers are able to access more technologically advanced equipment, such as a motor-powered grinder or an industrial press; these improvements, however, often come with additional maintenance costs and responsibilities that often create more work for an operation (The Shea Project, 2013).

Regional market prices for shea butter tend to be lowest during the shea nut harvest season, given the relatively abundant supply concentrated in shea-producing areas (Elias, 2007). This trend reveals limitations of domestic shea markets and illustrates the economic incentives for shea producers to attempt to enter international markets.

2.2. The International Shea Value Chain

The international value chain for shea and shea butter (Figure 4) includes several processes through which shea is converted from nut to commodity through the hands of various stakeholders. The limited data about shea export trends in Ethiopia suggest that an international market for shea butter from this region does not currently exist and that nearly 100% of shea in Ethiopia is for domestic use (Denney, Michael; Pers. corr.; October 2013; Lovett, 2004). Additionally, there is limited research and data on local and regional shea trade in Ethiopia as well as other producing East African countries such as Uganda and South Sudan (FAOSTAT, 2013; Lovett, 2004). Therefore, we first examine the relatively more developed international shea value chain that exists in West Africa, including data available from the eight primary exporting countries: Benin, Burkina Faso, Cote D’Ivoire, Ghana, Mali, Nigeria, and Togo (UNDP, 2010).

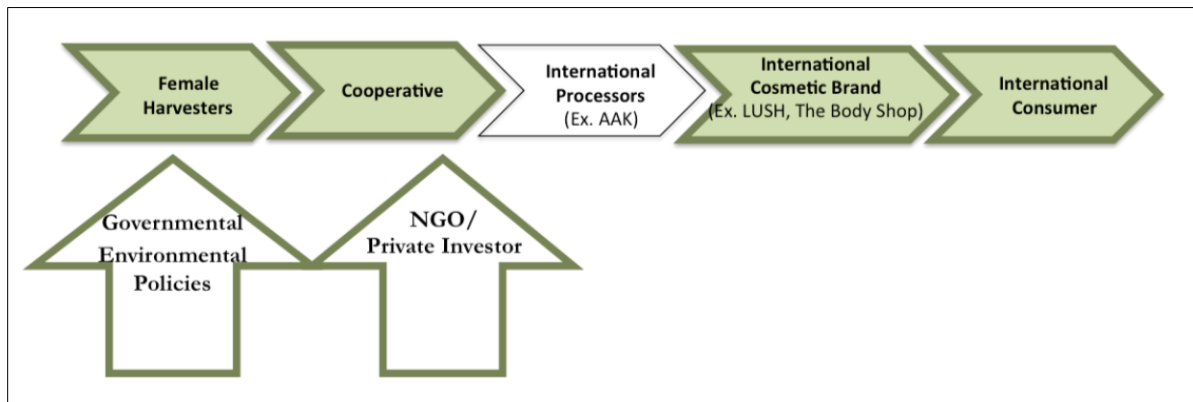


Figure 4. The international shea value chain (UNDP, 2010; Elias, 2007; Lovett, 2004).

The base of the international shea value chain starts with individual female harvesters, who either process the nuts into butter locally using traditional methods, or bring nuts to cooperatives that provide structure and organization for larger-scale shea collection and butter processing efforts (Ojoba Women’s Shea Cooperative, 2013; The Shea Project, 2013; Elias, 2007). Cooperatives in turn either sell nuts in raw form to international processors or sell processed butter to international consumers and cosmetic brands (UNDP, 2010; Elias, 2007).

International processors, such as AarhusKarlshamn (AAK) of Sweden - whose market share for West African shea is approximately 67% - are significant stakeholders. AAK's mass-processed shea, sourced from Burkina Faso and sold under the brand LIPEX, ultimately reaches international consumers across the globe (AAK, 2009). International consumers, including those in the U.S., primarily purchase shea from European Union (EU) processors (Lovett, 2004).

However, cosmetic brands such as The Body Shop and LUSH are also increasingly important stakeholders that have influenced shea production through their efforts to shorten the value chain, agreeing to purchase directly from female cooperatives at fair prices and eliminating international processors, as indicated in white in Figure 4. These direct purchasing initiatives have also sought to increase quality standards for African shea products in the international market (Reynolds, 2010; Elias, 2007; Lovett, 2004). The transparency of a direct relationship between suppliers and buyers allows for a standardization of processing techniques in order to ensure product quality related to characteristics such as purity and acidity content (Elias, 2007). Branded cosmetic products reach international consumers, who ultimately drive demand and impact the harvesting patterns of female collectors (Reynolds, 2010; UNDP, 2010; Elias, 2007; Lovett, 2004). Though not represented in the value chain in Figure 4, it is important to note that the EU cocoa industry is also a significant stakeholder in international shea markets, because the EU allows up to 5% cocoa butter substitutes in cocoa products (Lovett, 2004).

2.3 Ethiopian Institutions: Domestic Policies Relating to Shea

In addition to the international shea value chain, there are various domestic institutions in Ethiopia that influence shea production - most prominently by restricting shea harvest locations. The Ethiopian Environmental Protection Authority (EPA) is the primary institution governing the nation's natural resources, including non-timber forest products (Lemenih, 2010). The Ethiopian government legally owns all natural forests; however, due to the lack of strong institutional support, Ethiopian citizens and land investors have historically treated forests as open access resources, often leading to overexploitation (Lemenih, 2010). The Ethiopian EPA has made many reforms to forest policies in efforts to improve management of forests (Ayana, Arts & Wiersum, 2012; Horne et al., 2011; Lemenih, 2010; FDRE, 2007). Under the Ethiopian EPA, the Ministry of Agriculture and Rural Development established the Forest Management, Development, and Utilization Policy in 2007. The guiding principle of this policy is that "the development, conservation and sustainable utilization of forests plays a decisive role in satisfying the needs of the society for forest products and plays a significant role in the enhancement of national economy in general" (FDRE, 2007). This policy formally recognizes private and state forests, ultimately restricting resource access (Lemenih, 2010). It also legalizes community access to NTFPs, including shea tree stands for harvest. Additionally, this policy aims to strengthen forest product markets (including markets for NTFPs) (FDRE, 2007), which could benefit shea production by expanding regional and international NTFP sales and increasing incentives for improved management of existing shea trees (both planted groves and wild-growing trees).

In addition to federal laws, regional states have implemented policies to preserve natural

resources as well. In the Gambella Region specifically, the Ethiopian Wildlife Conservation Authority (EWCA) was established Gambella National Park in 1973 to protect and preserve 5,061 square kilometers of valuable natural resources (EWCA, 2012). Despite having these formal environmental institutions in place, however, conservation efforts in Gambella have largely lacked implementation (Ayana, Arts & Wiersum, 2012; Horne et al., 2011). Although the boundaries of Gambella National Park legally delineate land that is restricted for home construction and land use and development, various rural communities are located within park lines and continue their daily activities despite the Park's establishment (Horne et al., 2011). Additionally, recent large-scale land acquisitions for commercial agricultural investments (often foreign-owned) have proliferated in the Region. The Ethiopian Wildlife Conservation Authority (EWCA) estimates that 438,000 hectares have been leased within National Park boundaries (Horne et al., 2011), and no investments to date have performed Environmental Impact Assessments, though this process is technically required by law in the Federal Democratic Republic of Ethiopia (Horne et al., 2011).

In sum, forest resources in Ethiopia remain vulnerable due to a combination of resource competition among a growing domestic population and expanding international investment in Ethiopian lands, accompanied by a longstanding pattern of relatively under-supported formal institutions for forest governance (Ayana Arts & Wiersum, 2012). In the specific case of shea, these resource management challenges are exacerbated by the sheer lack of data – including data on shea production and consumptions, as well as data on the informal institutions governing existing domestic shea value chain in Ethiopia. Therefore, additional research is needed regarding factors necessary in creating successful shea production operations and opportunities for shea market development.

3. METHODS

This paper uses three primary methods to explore the potential social, environmental, and economic values of increasing shea production in the Gambella Region (Table 1). Through case study analysis we investigate two existing models for shea market development. We then use GIS analysis to examine existing tree population densities in our region of interest. Finally, we analyze primary data collected through a village-level household survey, conducted by the Gambella Agriculture Research Institute (GARI) in conjunction with the Horn of Africa Regional Environmental Center & Network (HoA-REC&N), to analyze the current and potential value of shea butter in the Gambella Region.

Table 1. Key measurements in determining the impact of shea in the Gambella Region.

Variable	Measurement	Source/Method
Social Value	<ul style="list-style-type: none"> • Uses of shea 	Household Survey
	<ul style="list-style-type: none"> • Advertised community benefits in the form of education, health care, women's empowerment 	Case Study Analysis
Environmental Value	<ul style="list-style-type: none"> • Shea tree density 	GIS analysis; Hall et al (1996); Gurmu (2009)
Economic Value	<ul style="list-style-type: none"> • The selling price of one unit of shea 	Household Survey
	<ul style="list-style-type: none"> • The percentage of household income from shea 	
	<ul style="list-style-type: none"> • The amount of money earned (birr) earned from shea in the rainy and dry seasons 	

3.1 Case Study Analysis

Case study analyses of ongoing shea production operations across Sub-Saharan Africa provide insights into different models for domestic and international shea value chain development. The Ojoba Collective, a primary supplier to the international company LUSH, serves as a case study for a private- investment-based shea development model. The Shea Project Uganda and the Shea Project South Sudan represent an alternative model in which support of an international development non-governmental organization (NGO) provides startup capital and training for shea market development (Table 2).

Table 2. Variables of interest in shea value chain case studies.

Organization	Location	Model	Year	Institutional Support	Certifications	Size	Variety
The Shea Project	Uganda	NGO Projects	1990	COVOL, USAID	Organic cert.*	10,000 houses	<i>Vitellaria paradoxa ssp. Nilotica</i>
The Shea Project	South Sudan	NGO Projects	1997	MEDIC, NPA	Organic cert. *		<i>Vitellaria paradoxa ssp. Nilotica</i>
The Ojoba Collective	Ghana	International Private Investment	2003	LUSH	Fair trade cert.	400 women	<i>Vitellaria paradoxa</i>

* Under USDA-NOP and EEC 2092/91 regulations

We use these different cases to explore key factors associated with successful shea market development. We then consider potentially transferable lessons from these two models of successful shea commercialization that might be applied to efforts to expand shea production in the Gambella Region.

3.2 Geographic Information Systems (GIS) Analysis

In order to determine whether shea is an available and viable resource in the Gambella Region, we performed a preliminary GIS analysis of shea tree population densities as reported in

two existing studies of known shea tree populations in the Gambella Region. Given that data are limited on forest coverage, growth and regeneration rates, and shea species habitats in East Africa, an understanding of shea stand locations as identified by Hall et al. (1996) and Gurmu (2009) helps to gain a better understanding of existing data and determine the feasibility of shea nut collection for rural communities. Additionally, mapping shea stand locations provides a context for understanding potential shea production constraints such as road access, national park boundaries, as well as political or ethnic divides.

3.3 Primary Survey Data Analysis

Finally, in order to gain a better understanding of the existing practices surrounding shea in the Gambella Region we analyzed primary survey data collected from households in a small shea-producing village in the Gambella Region. The survey was developed and implemented by HoA-REC&N and the Gambella Agricultural Research Institute (GARI) and seeks to assess the local value of shea and methods of production. A total of thirty households were selected randomly (from a village of 103 households) to participate in the study. All respondents were farmers, and 63% were female. A total of 29 out of the 30 respondents reported their household was involved in some aspect of shea butter production. A semi-structured questionnaire composed of 28 questions explored the potential impacts of expanded shea production and sales in the Gambella Region, including questions on a range of social, environmental and economic factors. Table 3 summarizes the responses to several questions of interest.

Table 3. Key measurements from the household survey (questions found in Appendix I).

Measurement	Mean
Age	43.5*
Percentage of households involved in shea production (Q3)	96.7%**
Distance traveled to collect shea nuts (hours) (Q9)	6.24
Use of shea butter (Q7)	Cooking***
Selling price (Birr) of shea per local unit (Q6)	10-30
Percentage of household income from shea (Q19)	38.6%
Rainy season income (Birr) from shea (Q21)	295
Dry season income (Birr) from shea (Q22)	188.3
Percentage of households who have faced shea shortages (Q24)	83.3%**
Causes of shea shortages (Q24)	Security, drought***
Impact of agriculture investments in the area (Q28)	Fewer animals***

* Data only available for 60% of respondents at the time of writing this report

** Actual value

*** Most common response

Taken together, these methods offer a comprehensive illustration of the current state of the shea market in the Gambella Region, and provide a foundation for developing strategies for further expansion of shea value chains in Ethiopia.

4. STUDY FINDINGS

4.1 Case Study Analysis: Models for Shea Market Development

Shea producer cooperatives are currently the main point of entry for shea into international markets. Producer cooperatives are institutions within shea-producing countries that bring together predominantly female harvesters to organize shea nut collection, shea butter processing, and participation in larger, often internationally active markets. Cooperatives operate under a common set of ethical goals and emphasize the sharing of benefits from their work (Ojoba Women's Shea Cooperative, 2013; Roberts, Cadi, Pers. corr., November 2013).

Major cosmetic brands such as The Body Shop and LUSH are for-profit stakeholders that have influenced shea production through their efforts to shorten the value chain by agreeing to purchase directly from female producers and women-owned cooperatives at fair prices (Reynolds, 2010; Elias, 2007; Lovett, 2004). The significant and steady demand offered by such direct international market relationships gives rural cooperatives financial security, allowing them to invest in technologies and training to increase shea production quantity and quality. In addition to international cosmetic companies and brands, international governmental agencies and non-governmental organizations have increased their interest and role in the production of shea across Sub-Saharan Africa. USAID supports initiatives such as The Shea Project, a NGO that works in Uganda to develop a sustainable shea industry while promoting sustainability and the enhancement of women's empowerment (The Shea Project, 2012).

These examples suggest two possible models for rural communities to access international shea value chains and establish lucrative shea production cooperatives: (i) commercial support from international private companies, and (ii) financial and infrastructural support from international NGOs. The following sections summarize these alternative models.

4.1.1. *International Private Investment*

The Ojoba Collective in Ghana represents an international private investment model for shea market development - a model characterized by an international for-profit company (LUSH) that directly supports a local shea cooperative (the Ojoba Collective).



Figure 5. Ojoba Collective logo (Ojoba Women's Shea Cooperative, 2013).

Established in 2003 by American investors Johan and Tracy Wulfers, Ojoba Collective is a women's cooperative located in the Bongo Soe village of northern Ghana (Ojoba Women's Shea Cooperative, 2013). Bongo Soe is located within an arid region where food insecurity is prevalent for much of the year, cash crops are not an available source of income, and women often have to travel far from their families for months at a time in order to find a source of income. Shea production is a valuable alternative source of economic security for these women, allowing them to financially support their families while working close to home (Roberts, Cadi; Pers. corr.; November 2013).

Over the past decade, the Ojoba Collective has grown from 40 to 400 members (Hamfelt, 2013). The cooperative remained underdeveloped for the first few years, relying on a structure built by a local NGO (Ojoba Women's Shea Butter Collective, 2013; Hamfelt, 2013). Additionally, Ojoba was faced with a number of cultural obstacles from the start, one being that men were concerned over their wives working outside the home (Hamfelt, 2013).

The Collective is structured so that women rotate roles in production - such as washing, roasting, or kneading the nuts and butter - and each earn an equal share of the profits (Hamfelt, 2013). In addition to providing substantial income to participating women, the Collective contributes to improving the quality of lives by empowering women and providing them with the power to pursue education and improved healthcare (Hamfelt, 2013; Ojoba Women's Shea Cooperative, 2013). One such strategy Ojoba implements to ensure these benefits are realized is a micro-finance system in which only the female workers can access their pay, preventing husbands from managing or misusing their income (Roberts, Cadi; Pers. corr.; November 2013).

LUSH's investment represented a transformative moment in the history of Ojoba Cooperative. The growth of the Cooperative was very slow for the first few years of its existence, and sales did not start to really expand until LUSH started purchasing shea butter from them in 2008 (Ojoba Women's Shea Butter Collective, 2013). Today LUSH reports purchasing ten metric tons of shea butter from Ojoba Collective twice per year (Ojoba Women's Shea Butter Collective, 2013).

In addition to providing a stable income for cooperative members, LUSH has also provided equipment for the Ojoba processing facility including solar cookers for roasting the nuts (Roberts, Cadi; Pers. corr.; November 2013). LUSH also provides additional forms of social and environmental support. Cadi Roberts, the Sustainable LUSH Coordinator, reports that LUSH has been able to build a community library surrounding Bongo Soe and is currently working on building a tree nursery. The goal of the tree nursery is to improve soil fertility by intercropping cashew and Acacia trees (an indigenous nitrogen-fixing species) with shea trees. LUSH provides not only a reliable market for Ojoba shea, but also technical and social support, reporting that "it's important for [LUSH] that [the cooperatives] have all the confidence, knowledge, and materials they need to make [production] happen successfully" (Roberts, Cadi; Pers. corr.; November 2013). At the same time, LUSH representatives note that LUSH does not directly manage production operations in the Collective, to ensure that all projects can operate

independently. This distancing acts as a safety net for the projects so that if anything were to happen to LUSH, the shea cooperatives would still be able to continue their enterprise (Roberts, Cadi; Pers. corr.; November 2013).

Heather Deeth, a representative from LUSH's North American buying team, reports that LUSH strives for transparency in their value chain by working directly with shea producers to obtain a high-quality product. LUSH works to maintain a relationship with shea producers by making regular visits to the cooperatives (Ojoba Women's Shea Butter Collective, 2013). Deeth also reports that LUSH chose to work with Ojoba over other cooperatives since they share the value of high community benefit outcomes (Ojoba Women's Shea Butter Collective, 2013). These values include women's empowerment associated with the ability to earn income closer to home, as well as the social and environmental goals Ojoba pursues in the production process. Roberts comments on the importance of maintaining consistent goals between suppliers and buyers stating that "find[ing] a company or buyer who shares the same ethical values...as the producers" is a key factor in establishing a fair-trade partnership and accessing markets (Roberts, Cadi; Pers. corr.; November 2013).

4.1.2. Non-Governmental Organization Projects

As an alternative to the for-profit Ojoba Collective model, the Shea Project Uganda and the Shea Project South Sudan established successful shea production cooperative projects (The Shea Project, 2012) with support from international not-for-profit non-governmental organizations (NGOs).



Figure 6. The Shea Project website logo (The Shea Project, 2012).

The concept for the Shea Project originated through an international NGO, the Cooperative Office for Voluntary Organization (COVOL) whose mission is to increase food and economic security sustainably in developing SSA countries (The Shea Project, 2013). With the assistance of COVOL, the Shea Project was able to secure financing, obtaining a revolving loan program in Otuke County, Uganda in 1992, and pilot funding from USAID during the years 1995-2001. With financial support in place, the Shea Project Uganda was able to incorporate various educational programs focusing on the shea processing industry. These programs include "technology development, production and marketing development, rural credit, environmental education and applied research on the shea resource" (The Shea Project, 2012). The Shea Project also developed both a technology package for improving shea production operations and a curriculum for technical training to teach project workers the necessary skills to manage regular processing advancements.

The Shea Project has initiated investments in technological improvements and maintenance

as a part of an overarching strategy for expanding production and improving production efficiency in locally-owned shea cooperatives. At an early stage the Shea Project Uganda invested in a diesel-powered grinding unit, which uses a motor to crush the nuts, as opposed to labor-intensive traditional manual grinding. After grinding, women use a simple hand press to convert the crushed nuts into shea butter. From there, the Shea Project Uganda has established a successful business producing cooking oil and cold-pressed cosmetic-grade shea butter for domestic and international markets. Today the Shea Project covers 10,000 square miles of northern Uganda and collaborates with 10,000 household participants.

By investing in technological improvements and supporting growing domestic and international market influence with promotional materials, the Shea Project is able to maintain their growing success. The project reports that the high quality of the Ugandan *nilotica* variety, “constrains Ugandan shea butter from the lower and middle-level price niches of the international market,” and that it is best marketed as a luxurious and costly product (The Shea Project, 2012).

In 1997, the Shea Project expanded to two new project sites located in South Sudan. Between 1997 and 2001 two NGOs - MEDIC and Norwegian Peoples Aid (NPA) - provided financial funding to send 200 Sudanese producers to the Shea Project Uganda site to receive training and education from COVOL. MEDIC put particular emphasis on the education aspect of developing productive cooperatives, calling for cross project partnerships and technical support. In 2001, MEDIC organized and hosted a technical training workshop bringing 35 representatives to collaboratively create nine projects. Following the establishment of financial support from MEDIC and an educational partnership with the Shea Project Uganda, the Shea Project South Sudan took the next step of investing in technological improvements. Shea Project South Sudan bought 10 grinding units and 30 hand presses, providing them the technological base for future improvements and changes (The Shea Project, 2012).

The Shea Project Uganda and the Shea Project South Sudan face similar challenges in terms of security concerns: both organizations face potential destabilization caused by social and political tensions. In 2002, northern Uganda was invaded by the Lord Resistance Army (LRA), forcing nearly all Shea Project Uganda workers into refugee camps. Subsequently, most of the 2002 harvest was lost, and shea nut prices increased by 50%. The Shea Project Uganda responded by centralizing operations to their main office in Lira, a city in Northern Uganda, where members now bring their nuts to process into butter for purchase by the project. In South Sudan, the Shea Project faces an even longer history of civil war and political uncertainty, creating a similarly unstable atmosphere for producers and processors. As a result, the Shea Project South Sudan experiences significant turnover - and now focuses on two-year program funding cycles that are more resilient to disruptions and changes but may discourage longer-term investments (The Shea Project, 2012).

4.1.3. Case Study: Discussion

The goals behind the shea producer cooperatives in each of the shea commercialization models described above include (i) producing high quality shea butter to be sold both domestically and internationally, (ii) empowering women, and (iii) improving the community as a whole (Ojoba Women's Shea Cooperative, 2013; COOPROKAS, 2011; International Trade Forum, 2008). Both for-profit and not-for-profit institutions have influenced shea production in Sub-Saharan Africa by facilitating access to international markets, improving processing technologies, improving shea product quality, and working towards sustainable resource management among other initiatives (Ojoba Women's Shea Cooperative, 2013; Ojoba Women's Shea Butter Collective, 2013; The Shea Project, 2012).

Taken together, the case study analysis comparing international private investment models of shea value chain development and NGO-led development project models suggests that the most successful shea cooperatives involved in international markets today function with some form of external support - both financial and institutional - that connects cooperative suppliers to buyers, as well as provides infrastructural and management support. In addition, once producer cooperatives were established, expanding cooperatives' markets and finding specific market niches was key to the success of both for-profit and non-profit shea commercialization models: the Ojoba Collective started to see its greatest successes after entering contracts supplying for LUSH, while expanding domestic and international markets through active marketing strategies has contributed to the growth and success of the Shea Project in Uganda and South Sudan. In order to make market growth feasible, both partner institutions prioritized projects that improved shea production efficiency, which enabled the cooperatives to enter larger markets. But at the same time the shea commercialization initiatives described here have also made significant investments in human capital - training in improved production, marketing and management techniques - that have allowed local cooperatives to remain autonomous, and adapt to challenges including political insecurity. Finally, a consistent finding between both for-profit and not-for-profit shea models to date is an emphasis on women's empowerment and improved social outcomes as a result and measurement of projects' success: in addition to the direct benefits to women and rural communities, this emphasis has allowed shea marketers to advertise their product as an environmentally and socially beneficial product - attributes that demand a premium in increasingly lucrative international markets.

The case study of LUSH and Ojoba Collective offers insights into determinants of successful shea market and cooperative development through an international private investor model, while the case of the Shea Project in Uganda and South Sudan suggest many of these same factors are important to the success of an NGO-led shea commercialization model. These factors are summarized in Table 4.

Table 4. Enabling factors in shea market/cooperative development according to two case study models.

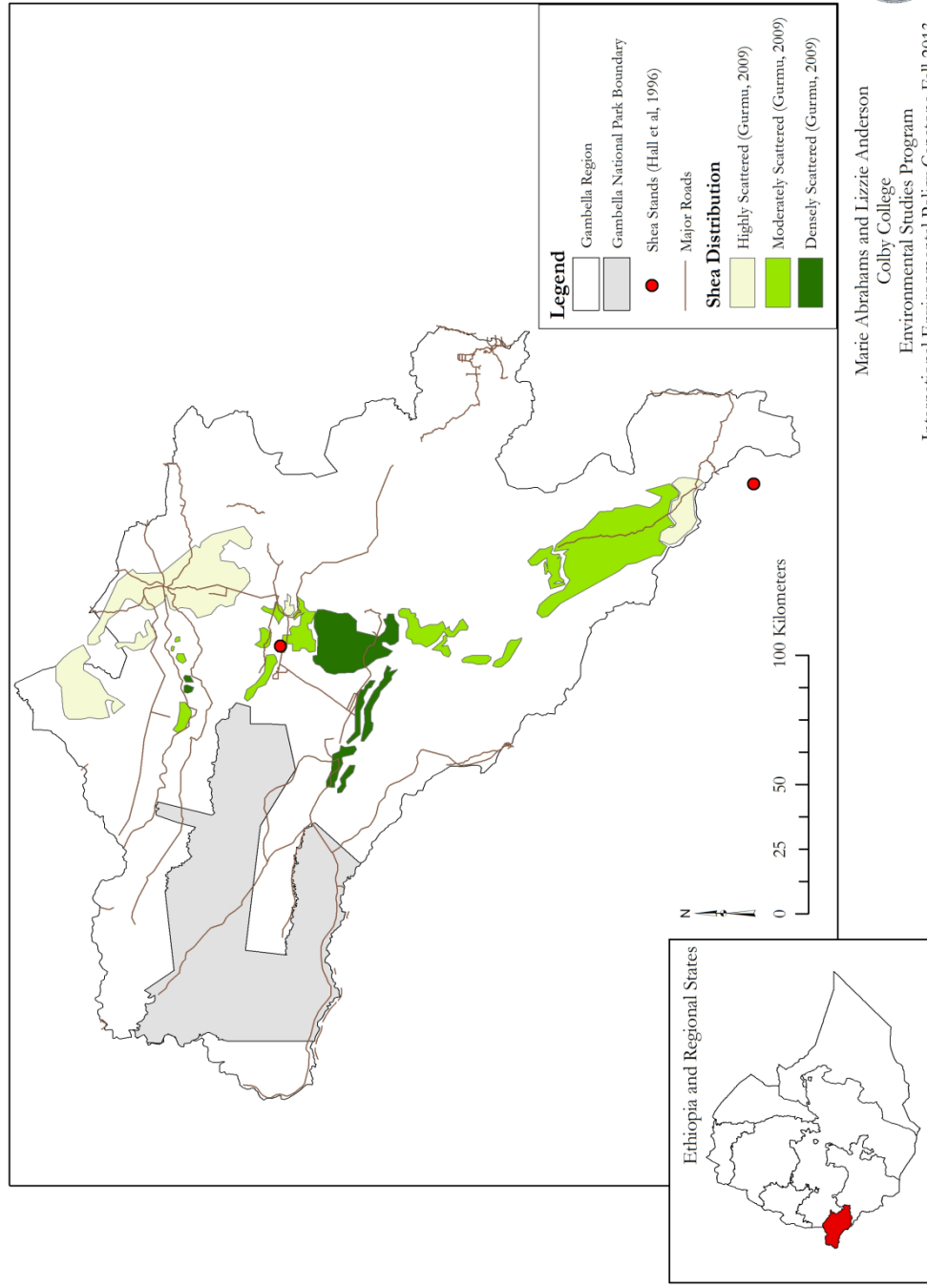
	LUSH/Ojoba Collective	The Shea Project
1) Forming structural basis	A pre-existing cooperative	Secure financing through NGO support
2) Establishing project niche	Support from an associate private company	Maintain increased success in expanding markets and production
3) Increasing/improving production	The size and capacity to produce high quantity and quality outputs	Invest in continued technological improvements
4) Ensuring community benefits	Consistent goals between cooperative and private investors	Establish educational programs

We next consider these facilitating factors that contribute to successful shea operations elsewhere while investigating the potential for shea production in the Gambella Region.

4.2. GIS Analysis: Opportunities for Shea Development in Gambella

GIS analysis (Figure 7) overlaying Hall's 1996 study of shea stand locations and Gurmu's 2009 study of shea density indicate that shea stands are located in a clearly defined belt down the center of the Gambella Region. Gurmu's comprehensive study of *Vitellaria paradoxa* in the Gambella Region, the most recent and comprehensive study pertaining to our research area, shows a higher density of shea in the center of the region, consistent with stands that Hall recorded in 1996. Gurmu also finds scattered and highly scattered shea distributions exist in the northern and southern areas of the region.

Shea Distribution in the Gambella Region of Ethiopia



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Figure 7. Shea Distribution in the Gambella Region of Ethiopia (Gurmu, 2009; Hall et al., 1996)

4.2.1 GIS Analysis: Discussion

Shea stands appear to be generally accessible from major roads (road lines indicated in brown in Figure 7). While this has positive implications for the convenience of rural communities collecting shea, this may represent a weakness in Gurmu's study. Perhaps the only shea habitats recorded were those that were practical to survey given their proximity to roads. This suggests the possibility that additional unrecorded shea habitats exist.

However, Gurmu also notes that the replacement rate in his study areas, or the ratio between seedlings and saplings and encountered shea trees, is 1:1 (Gurmu, 2009). Given that shea is a slow-growing tree, this low regeneration rate suggests that shea habitat populations are vulnerable to decreasing. This suggests that deforestation rates can easily surpass the rate of regrowth unless conservation efforts are implemented.

Gurmu's research also indicates that shea tree density is greatest towards the center of the Region. However, shea thrives in biodiverse areas that are comprised of multiple dominant trees making it difficult to identify via aerial photographs (Gurmu, 2009). Given this conclusion, it may not be practical to further pursue GIS analysis mapping shea using aerial photography.

4.3 Household Survey Data Analysis: Opportunities for Shea Development in Gambella

Household survey results from a small shea-producing village in the Gambella Region indicate that shea is a valuable economic resource with a thriving local market. Among shea producing households, survey results suggest shea comprises as much as 40% of household cash income. Prices received from shea butter range from 25 Ethiopian birr to 75 birr (about \$1.3 to \$4 U.S. dollars) per local unit (roughly 1 liter in volume). Households sell shea to neighbors for the average price of 29 birr per unit and to other villages for an average price of 35.5 birr per unit (Figure 8). The survey also indicates that shea is an important source of income during both the rainy and dry seasons, providing on average 295 and 188 birr per season respectively.

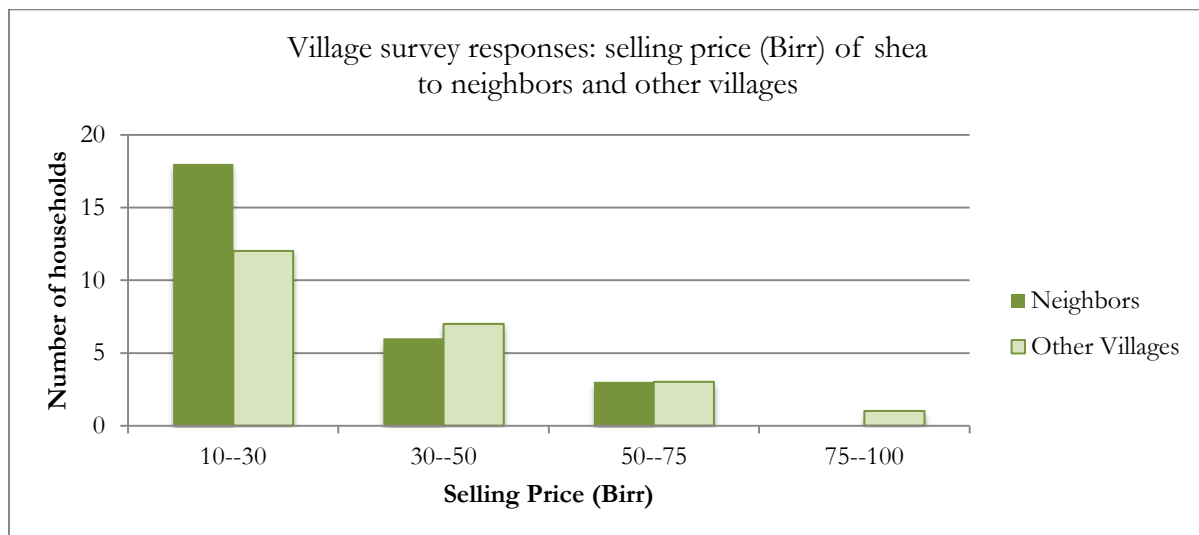


Figure 8. Household survey responses to Q6: Shea selling prices (Appendix I).

Survey results further suggest that local shea markets in Gambella may be constrained by production challenges rather than by a lack of local demand for the product: fully ninety-seven percent of survey respondents reported they would be able to sell or barter twice the quantity of shea if they were able to produce that amount. For further insights into production constraints, the household survey also asked households about the availability of shea nuts. Twenty-five out of 30 producing households responded that they have faced shortages of shea in the recent past, citing “security” reasons and “drought” as the two most common responses, followed by “transportation” (Figure 9).

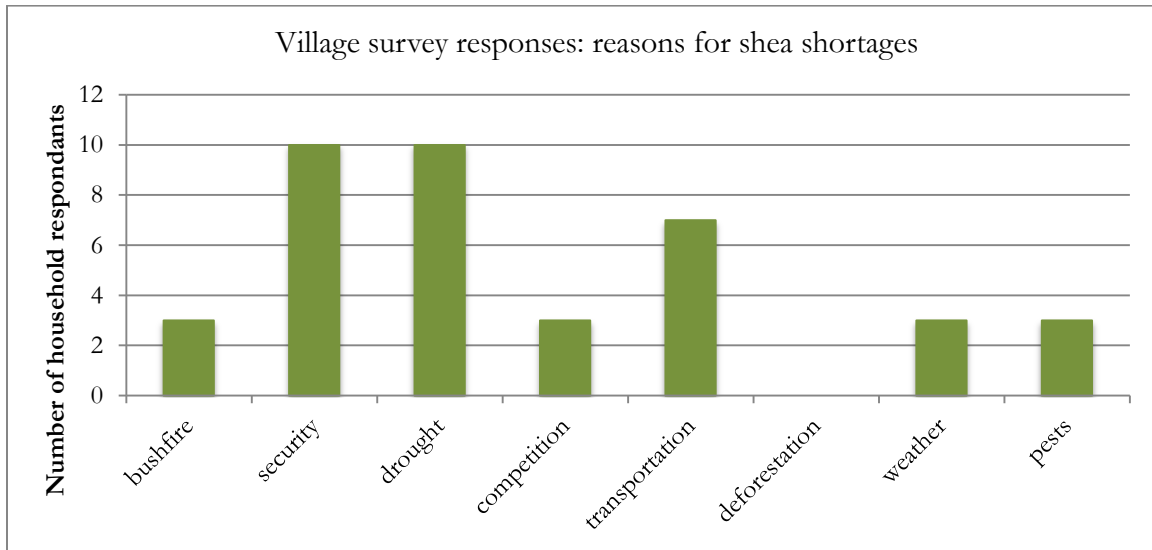


Figure 9. Household survey responses to Q24: Reasons for shea shortage (Appendix I).

Notably, although “deforestation” was included on the survey as a possible cause of shea shortages, none of the households reported deforestation as a major contributor to the scarcity of the shea resource.

Finally, in an effort to assess the potential impacts of large-scale agricultural investments in the Gambella Region on shea producers, survey question 28 asked respondents what changes have accompanied the recent presence of agricultural investments (Appendix I). The most common changes reported were the presence of “fewer animals” followed by “more jobs” and responses of “no change” (Figure 10). “Less shea” and “deforestation” follow. In this question deforestation was not a response prompted by the survey, but instead an example of change that respondents provided independently.

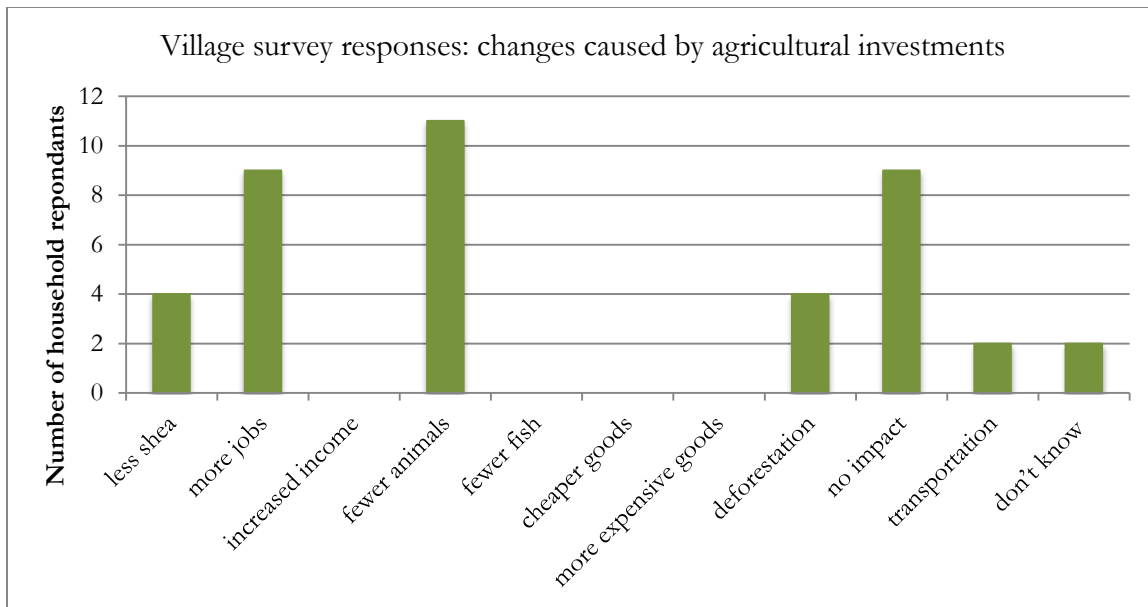


Figure 10. Household survey responses to Q28: Changes caused by agricultural investments (Appendix I).

4.3.1. Survey Analysis: Discussion

Survey results from a pilot study of a single shea-producing village in Southern Gambella indicate that shea butter is a valuable source of income (Table 1, Q19), with a perceived potential for increased production and sales (Appendix I, Q23). Additionally, households tend to receive a higher price for shea when sold to other villages compared to when sold to neighbors (Table 1, Q6). Taken together this information indicates an existing local and regional market with potential for expansion, even without immediate access to more lucrative international markets.

Overall, survey responses illustrate that although there are limitations to the shea resource, the capacity for increasing production and local demand exist. The survey also provides insights into key barriers to shea commercialization in the Gambella Region - “security,” “drought,” and “transportation” were reported as the three leading contributors to shea nut shortages in the survey village. This suggests that increasing access to shea through transportation infrastructure (e.g., roads) and equipment (e.g., animal-drawn carts) as well as preparedness for possible security threats such as cattle raids may be of especially vital importance to the establishment of cooperatives in this region. In addition, it is important to recognize environmental conditions, such as drought, as a potential disruption to the success of shea production in the region.

Survey responses to question 28, regarding the impact of agricultural investments (Table 10) indicate that although there are certain negative environmental impacts associated with large-scale farmland developments such as deforestation and fewer animals, a significant number of responders consider agricultural investments a positive presence by creating more jobs. In addition, while some respondents noted “less shea” as an impact of agricultural investments, others noted “more transportation,” suggesting the road infrastructure and additional transportation opportunities offered by agricultural investments might help overcome current barriers to shea production.

5. DISCUSSION

Findings from case study analyses, GIS analysis, and a village survey offer a comprehensive view of both the current and potential value of shea in the Gambella Region. To date, both international private investments and not-for-profit NGO projects have provided successful models for shea market chain development in Sub-Saharan Africa. Facilitating factors that enable the success of producer cooperatives include financial support, the capacity to expand markets, and the choice to prioritize social benefits, especially human capital investments that improve production practices and management, and broader community benefits-sharing arrangements that allow for shea to be sold as a socially beneficial product.

These findings reveal important tradeoffs to consider in efforts to expand shea markets through international investments. One concern is that providing funding and technological improvements will foster dependency on external donations. If donated technology breaks or funding is depleted, local producers and cooperatives may be unable to continue production on their own - suggesting successful shea development initiatives might sacrifice some short-term production in favor of investments in longer-term productivity using locally available resources and expertise. Similarly, while investments in improved processing technology might increase short-term shea production, such investments may also threaten gender equity. Traditional shea processing methods are very labor-intensive and time consuming for producers (mostly women); if new equipment allows shea processing to become more mechanized and less labor intensive then men may become more involved. Since female-run shea cooperatives provide a vital avenue for women's empowerment – and perhaps greater international marketing potential because buyers feel a moral incentive for the purchase of goods that supporting underdeveloped communities - investments in shea processing technologies must be considered carefully.

Conclusions from the GIS analysis indicate that shea is an available resource in the Gambella Region, with existing published data indicating that shea density is highest in the center of the region. The limited data to date from plot-level shea analyses in the Gambella Region warn, however, that the resource may be unstable without improved management – low regeneration rates threaten the long-term viability of existing shea stands. Expanded GIS analyses of shea stands and density could be considered in determining suitable locations for village-based cooperatives and processing facilities, but more detailed on-the-ground studies are needed to ascertain where interventions are needed to increase natural regeneration, or even plant shea groves to the extent possible to sustain and expand shea production in the future.

Social tension specific to the Region - including periodic cattle raids originating within Gambella and across the South Sudanese border - must also be considered when investing in cooperative development efforts. One current National Science Foundation IGERT proposal seeks to create a radio system through the shea habitats of Gambella to mitigate the threat of periodic cattle raids (Denney, Michael; Pers. corr.; October 2013). Considering local and regional security in the shea market development plan could strengthen the shea value chain by incorporating strategies to promote resilience in a cooperative.

Finally, village survey results suggest that shea has an underdeveloped market in Ethiopia; not only does trade function primarily on a local level, but also respondents indicated that current production does not even meet local market demand for shea butter, let alone potential international market demand (Appendix I). Given that Ethiopia is the only shea-producing African country that does not have a shea exporting industry, the establishment and expansion of shea cooperatives could represent a significant opportunity for rural communities to enter a growing NTFP-based industry.

To date the Gambella Region does not have access to either international private investment or large-scale NGO funding to provide financial support, market access, and community development benefits necessary for successful shea market expansion. Rather, efforts to access domestic and international shea value chains in this region remain small-scale and village-based (Denney, Michael; Pers. corr.; October 2013). Village-based efforts work within small communities with no or limited external funding to mobilize local labor, pool community resources for shea butter processing, and increase local and regional production and sales. Though limited evidence is available to say whether this village-based model might improve the production of shea independent from any external financial support, it is possible that small-scale community investments in technical and institutional improvements might support expanded local production, and ultimately even enable village cooperatives to enter larger regional and international markets (Box 1).

Box 1. Bottom-up shea value chain development?

While examples of a village-level approach to creating thriving shea cooperatives in the absence of major international funding did not come emerge through this research, current researchers in the Gambella Region associated with UMASS Boston under an Integrative Graduate Education Research Traineeship (IGERT) grant - a National Science Foundation program - in collaboration with HoAREC&N are currently exploring this model of development. Specifically, ongoing research in the Gambella Region seeks to:

- *Identify the most well suited communities for establishing a women-based cooperative based on economic grounds;*
- *Provide strategic support for organizing cooperatives, identifying leaders, and coordinating with cooperative workers;*
- *Refrain from providing financial or technological support that cannot be reproduced locally; and*
- *Identify and respond to potential threats to shea production operations and workers.*

The ultimate goal of this approach is to strengthen the shea butter supply chain while promoting a sustainable livelihood that will allow villages to live using available natural resources (Denney, Michael; Pers. corr.; October 2013).

6. POLICY RECOMMENDATIONS

This research highlights a number of opportunities for the development of the shea value chain in the Gambella Region.

Forge International Partnerships. Based on the understanding of successful shea operations in Sub-Saharan Africa, findings suggests successful shea cooperatives in Sub-Saharan Africa to date have depended on external support either in the form of an NGO or private investor to reach global markets. Village-level producer groups and cooperatives in Gambella could benefit from this form of support – particularly given that known shea availability and current market values in the Gambella Region appear to support expanded production. The immediate economic benefits provided by a private investor partnership - as illustrated by the LUSH/Ojoba

Collective case study - might allow Gambella to reach an international market, provide the cooperative with steady demand, and result in community benefits.

Pursue Local and Regional Opportunities. While an international partnership may be a fitting long-term goal, village survey data indicate that the selling price of shea is higher when sold to other villages as opposed to neighbors. Therefore, a start-up cooperative in Gambella could earn greater economic benefits by focusing on regional, rather than a local, markets in the short term.

Emphasize Ecological and Social Benefits. From a marketing perspective, the Gambella Region offers an appealing environmental and social context for shea market development that can be used as advertising opportunities in entering international markets. Given that the subspecies of East African shea (*Vitellaria paradoxa ssp. nilotica*) is of higher quality than the West African shea that currently dominates international markets, a cooperative in the Gambella Region could use this quality premium as a marketing strategy. At the same time, given the widespread media coverage of large-scale agricultural developments in the Gambella Region that in some cases threaten fragile ecosystems and displace local communities (Ingram et. al., 2012; Horne et. al., 2011), the case could easily be made that “Gambella Shea” represents a socially conscious purchase, one that both contributes to environmental protection (supporting NTFP production and providing incentives for good forest stewardship) and simultaneously supports poor rural communities in the Region. Research from existing shea cooperatives across Sub-Saharan Africa shows that advertising the social benefits associated with shea production is an appealing characteristic to trade partners and international consumers.

Recognize and Address Barriers to Investment and Production. When considering the potential for a shea cooperative in the Gambella Region, it is important to recognize social tensions that exist in the area that may disrupt shea production. These risks include the threats of agricultural investments on the availability of this resource as well as security threats from cattle raids. Therefore, a protection strategy for shea would be helpful in agricultural investment management, especially given the vulnerability of shea based on its low regeneration rates. In response to security threats, it is important to plan for such events by creating a safety net in the business plan (Denney, Michael; Pers. corr.; October 2013; The Shea Project, 2013).

Increase Data Availability. Finally, research should continue thorough surveys on shea availability and additional studies on shea habitats in the region. A more extensive survey including questions regarding interest in cooperative participation and investment could advance an understanding of this opportunity. This would help inform interested stakeholders on the extent and sustainability of this resource, as well as help determine the best location for a potential cooperative.

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8. CHAPTER 4 APPENDICES

Appendix I: Survey Questions Used in the Report

Q6. (Ask for an explanation of the local unit for selling shea. ex. one bottle, one pot etc. When finished, see if they will give you an example of their local unit).

How much do you sell one unit of shea butter for?

Q7: How do you use the butter?

Q9: What is the distance you travel to collect nuts (there and return)?

Q19: (Use the beans. Ask interviewee to divide the ten beans into money made from shea and money made from other sources)

What percentage from your income comes from shea?

Q21: During the rainy season, how much money will you expect to make from shea?

Q22: During the dry season, how much money will you expect to make from shea?

Q23: If you were able to produce twice as much shea butter ever month, could you sell or barter all of it?

Q24: Have you ever faced a shortage of shea nuts? If yes, what was the cause?

Q28: There are big agricultural investments in this area. How have they changed this area, and what impact have they had on your livelihood?

Note: All questions provided a range of response and an option to offer an open response.