

Improving the Quality of Women's Gold in Mali, West Africa: The Case of Shea

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Abstract

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The collection, primary processing, and subsequent sale of shea-based products make an important contribution to rural women's cash income in many of Mali's shea producing areas. Internationally, shea has recently become popular in high-valued cosmetics thanks to its therapeutic properties— a deviation away from its historic use as a cheap cocoa-butter substitute. For these reasons, international development actors have targeted the Malian shea value chain as part of their private-sector-development and rural-poverty-alleviation programs and strategies. Information asymmetry in the production and marketing of shea has led to a "Market for Lemons" scenario much like that described by Akerlof (1970), thereby compromising the subsector's potential to serve as a powerful source of rural income growth and poverty alleviation. A combination of tools is used to describe the Malian shea value chain, including the "Structure, Conduct, Performance" framework borrowed from the industrial organization literature and the "Subsector Studies" approach popular in current export-led international development strategies. Analogies from subsectors historically plagued by adverse selection and moral hazard are used to identify potential leverage points and intervention strategies for stakeholders to help improve shea quality and returns to primary producers. The analysis suggests the Malian government has the potential to play an important role in this process as a coordinating body and channel captain, with donors and private enterprises playing complementary roles.

Keywords: Information asymmetry, karité, Mali, rural development, shea, women's income.

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Acronyms

ACOD	Association Conseil pour le Développement
ADF	African Development Foundation
APROMA	Association des produits à marché
ARSO	African Organization for Standardization
AV	Associations Villageoises
CBE	Cocoa Butter Equivalent
CBS	Cocoa Butter Substitute
CFA	Communauté Financière d'Afrique
CFC	The United Nations' Common Fund for Commodities
CMDT	Compagnie Malienne pour le Développement des Fibres Textiles
CSPPA	Caisse de Stabilisation de Prix et des Produits Agricoles
FDI	Foreign Direct Investment
FFA	Free Fatty Acid
G&S	Grades and Standards
GBGS	Ghana Board of Grades and Standards
HUICOMA	Huilerie Cotonnière du Mali
ICCO	International Cocoa Organization
ICRAF	World Agroforestry Center
ID	International Development
IER	Institute d'Economie Rurale
IO	Industrial Organization
IPR/IFRA	Institute Polytechnique Rurale de Formation et de Recherche Appliquée
MDG	Millennium Development Goals
MFP	Multifunctional Platform
MPFEF	Ministère de la Promotion de la Femme, l'Enfant et de la Famille
NGO	Non-Governmental Organization
NPMB	National Produce Marketing Board
NTFP	Non-Timber Forestry product
OMA	Observatoire du Marché Agricole
OMAFES	Œuvre Malienne d'Aide à la Femme et à l'Enfant au Sahel
PAH	Polycyclic Aromatic Hydrocarbons
PNK	Projet National Karité
ROESAO	Network of Economic Operators in the Food Industry
SAP	Structural Adjustment Program
SCP	Structure Conduct Performance
SNV	Netherlands Development Organization
TC	Transaction Cost
UEOMA	Union Economique Monétaire Ouest Africaine
UN	United Nations
UNEP	United Nations Environment Program
UNESCO	United National Educational, Scientific and Cultural Organization
UNIFEM	United Nations Development Fund for Women
USAID	United States Agency for International Development

WATH	West African Trade Hub
WLFP	Women's Labor Force Participation
WB	World Bank

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I. Introduction

In Mali, West Africa, the production and marketing of shea (karité) based products make an important contribution to rural women's cash income in high-yield areas such as Koulikoro, Ségou, and Sikasso. Shea butter, referred to as "women's gold", is used throughout this region as a cooking fat, a "cure all," and as a beauty product. As a result of family income partitioning practices, shea revenues play a central role in children's nutrition and education in many parts of Mali. Several of its attributes make shea popular in industrialized nations as a cocoa butter substitute, as a beauty product, and in pharmaceuticals (Alander, 2004).¹ Of all 19 shea producing countries, Mali exhibits one of the highest levels of local consumption (as a percentage of production) (Lovett, 2004), resulting in competing marketing channels—destined for the domestic and international markets.²

Individual women dry the shea nuts and extract shea butter (oil) for personal consumption or for sale on the local market. Increasingly, individual entrepreneurs and producer groups (village level associations and cooperatives) are engaged in down-stream value-added activities including oil purification, lotion and soap production, and domestic and international marketing. Internationally, only a few foreign oilseed processing firms are engaged in the subsector and serve both the mass and niche markets for shea butter.³ Shea is unique in that unlike many exported African commodities (such as coffee, cocoa,

1 Shea butter is popular as a cocoa butter substitute for its triacylglycerol composition and popular in cosmetics and pharmaceuticals for its unsaponifiable components.

2 These marketing channels are competing in that they compete with one another for inputs of production and for clients in the output sector (Staat, 1997).

3 The cocoa butter substitute market would be considered a mass-market, while the cosmetics and pharmaceutical markets would be considered "niche" markets.

cotton and copper), shea-based products are used extensively in developing and industrialized nations alike. Shea therefore represents the intersection of an indigenously produced and consumed commodity (Chalfin, 2004) and the modern, evolving and changing global agrifood-system described by Boehlje (1999) and others.

Although the quality of shea nuts and oil is determined by village-level handling practices (drying, storage and oil extraction), the quality of Malian shea is only tested and remunerated much later down the marketing chain. In the past decade, the international community has observed a marked decrease in the relative quality of Malian shea-based products, reflecting the lack of incentives for village-based producers to invest time and energy into producing high-quality products. This has led to a decrease in the quantity of Malian shea demanded by the international community and the price paid for it— a modern day rendition of Akerlof's (1970) "Market for Lemons."⁴

⁴ This is anecdotal in that many industry sources and researchers have noted this issue (Chemonics, USAID). Malian shea export values and quantities (such as the ones collected and disseminated by the Malian Government or the FAO) are either incomplete or unavailable. For these reasons, a graph depicting the described phenomenon is not provided.

Box 1

The Market for Lemons

George Akerlof (1970) illustrates the issue of payment for quality in the presence of uncertainty in the market for used cars. Individuals in the car market purchase their vehicles without knowing whether the car is a “cream puff” (good) or a “lemon” (bad). Information asymmetry is present as the sellers (agent) have more information about the quality of a car than the buyers (principal). As a result, “good cars and bad cars can still sell at the same price— since it is impossible for a buyer to tell the difference between a good car and a bad car.” In response, buyers attempt to estimate the quality of a car offered to them by considering the average quality of the cars offered in the market (Varian, 1992). Sellers of good cars cannot expect to receive the true value of their vehicles and most, if not all, cars traded will be “lemons,” as owners of good cars withdraw them from the market. As the price falls, so does quality. In this case, the bad cars tend to drive out the good, as it is impossible for buyers to tell the difference between a good and a bad car; only the seller knows (Akerlof, 1970). The Malian shea market exhibits many of these same characteristics.

Given its integral role in many rural women’s cash income, international donors, non-governmental organizations and, more recently, the Malian government, have targeted the shea subsector as part of private enterprise and women’s-promotion efforts. Mali’s reputation within the sub-region as a source of low-quality shea has, and continues to, thwart such efforts, thereby precluding shea from realizing its full potential as a catalyst for rural income growth and poverty alleviation.

The predicament described above is the motivation behind this study, whose overall objective is to identify ways in which to improve the quality of Malian shea and increase returns to primary female producers and their rural communities. To achieve this objective, a thorough understanding of the structure of the Malian shea subsector is merited. First, this paper presents an overview of the knowledge gap and proposed conceptual framework. Second, it describes the structure, conduct, and performance of the Malian shea value chain. Third, it presents a series of analogies from other subsectors plagued by

information asymmetry designed to motivate lessons to learn and potentially apply to Malian shea subsector promotion efforts. Fourth, this paper provides an overview of past interventions and proposals for future donor, NGO, and private sector involvement. This paper concludes with suggestions for how the Malian government may, in the future, take on the role of channel captain.⁵

⁵ A channel captain is an “actor in the sub-sector who takes a major initiative in developing arrangements for improved vertical coordination” (Staatz, AEC 841, 2007).

II. Motivation for this Study and Knowledge Gap

Donors and international development organizations such as USAID (2006), Chemonics (2001), and Action for Enterprise (2005) have conducted several shea value chain studies. These describe the West African, Malian, or downstream shea subsector. Limited attention has been paid to the problems plaguing the Malian subsector's rural sphere—despite widespread acknowledgement of an observable systematic decrease in the quality and international competitiveness (and reputation) of Malian shea. These studies have largely assumed that market-based incentives will trickle down to the primary producer level and concentrate on identifying ways to provide technical assistance to the small number of exporters and large wholesalers (a key leverage point) and fail to either (1) describe the entire shea value chain, including women's time-competing activities during the integral rainy season; or (2) propose ways in which to alter incentives at the primary and secondary producer level to actually improve quality in the rural areas where it is first established.⁶

While exporters understandably play an important role in the export of shea and are likely much easier to apply leverage to (given their concentrated numbers in either Mali's capital city, Bamako, or other large cities), Mali's reputation as an exporter of high quality shea products depends on village-level activities and dynamics. This study first contributes to the available literature on the Malian shea value chain and second to sub-sector studies on high-valued and value-added agricultural exports plagued by quality-related issues and promoted as part of private sector development schemes in developing regions.

⁶ A key leverage point is a node in a commodity's production-marketing sequence at which intervention (by, for example, government, international donors and NGOs) can affect a large number of market actors (such as firms and individual primary producers) at once (Staatz, 1997).

III. Conceptual Framework

The primary objective of this study is to identify ways in which to improve the reputation of Malian shea butter and nuts on the world market so that the shea subsector can achieve its potential as a powerful source of rural income growth and contributing factor to poverty alleviation. To do so, it is necessary to understand how the subsector is coordinated and identify key leverage points that may be targeted to alter the incentives present such that the quality and quantity of shea-based products sold for export in Mali are improved. Evidence suggests that Mali's reputation as producer of low-quality shea nuts and butter is in part the result of high levels of information asymmetry between marketing actors (resulting in the effects of adverse selection and moral hazard).

The author has hypothesized that one way to improve current market performance outcomes (characterized by increasing the quality of shea products and in the prices paid for them) is to improve the economic incentives faced by rural Malian women to produce "improved quality" shea butter for the high-valued domestic and export markets.⁷ This may be achieved via structural or institutional change at identified key leverage points. A salient byproduct of this result is augmented returns to the many rural Malian women who derive an important portion of their income from this subsector year-in and year-out.

The conceptual framework for this paper consists of a combination of tools derived from "structure-conduct-performance" (SCP) analyses adopted from industrial

⁷ This is consistent with the women's labor force participation (WLFP) literature, which focuses on effects of incentives faced by women through both their wages and opportunity cost (such as household labor) on labor force participation. By analogy, this paper focuses on alternative pricing arrangements (wages) on women's decision to invest their time in "improved" shea production methods.

organization literature and the subsector analysis approach currently used as the building block of many value chain promotion efforts by international development organizations in developing regions. Subsector studies are a vertical application of the SCP approach. The use of analogies (or analogous experience) drawn from other subsectors is consistent with this framework, as it points to how unfavorable performance outcomes are mitigated in other subsectors plagued by the forces of moral hazard and adverse selection. This research approach was originally proposed by Hildreth, Krause, and Nelson (1973), with the idea of making generalizations from “one subsector from an in-depth appraisal to another” (French, 1974).

A. Structure-Conduct-Performance from Industrial Organization

Misaligned market-based incentives faced by primary female producers were identified as a major constraining factor to the amelioration of shea nut and butter quality in Mali. To understand how such incentives may be realigned, the Structure-Conduct-Performance conceptual framework has been chosen as the primary conceptual framework for this analysis. The SCP analysis approach is appropriate for our purposes, as it is founded on the idea that market performance is influenced by the structure (organization) and the conduct (behavior) of its participants (Caves, 1992; Brandow, 1976; Jesse, 1978). This research methodology was originally developed for the field of industrial organization but is used extensively in agribusiness studies and in agricultural economics (Caswell, 1992).

i. Asymmetric Information

Asymmetric information flow is a defining characteristic of the conduct of actors within the Malian shea subsector—between rural traders and shea producers, principal

and agent, respectively. This behavior has been strongly influenced by the subsector's structure. Together, these characteristics lead to the undesirable market performance outcomes mentioned above. The SCP conceptual framework is used to present the issue of information asymmetry. The proposed analogies present mechanisms through which to potentially remedy the negative effects of information asymmetry through changes to the subsector's structure and conduct.

B. Subsector Approach

The area of research on subsector studies is “simply defined to include both the vertical and horizontal relationships in a significant part of the food and fiber sector” (Shaffer, 1973). This approach has recently been widely used by international development organizations, as “value chain promotion” is the corner stone of many private-sector development strategies (Altenburg, 2007; USAID, 2007). Such strategies increasingly target high-valued or value-added commodities, characterized as a deviation away from traditional exports. Often, high-valued commodities are not consumed extensively by the population producing and marketing them (such as coffee, some fresh fruits and vegetables, and fresh cut flowers), resulting in the promotion of a single “for-export” value chain. In contrast, the Malian shea value chain is partitioned into two competing marketing channels—one destined for the rural *domestic* population and another destined for the high-income urban and *export* markets.

To achieve the paper's objective, first an understanding of the structure of the Malian shea value chain and interactions between various actors is merited. The tools proposed by Haggblade and Gamser (1991) for subsector analyses are used to map the organization and structure of the Malian shea subsector as part of SCP analysis

described above. The results will lead to the identification of key leverage points for intervention, as suggested by Staatz (1996), and potential policy recommendations.

IV. Data

This study draws on both primary and secondary data. In 2006 and 2007 the author had the privilege to serve as a USAID Farmer-to-Farmer volunteer in Mali. As part of her assignment she was informally asked to identify why the producer groups receiving USAID assistance were not performing as anticipated (in terms of both the quantity and quality of goods produced). It was in this context that the author conducted informal interviews and mediated focus group discussions with actors throughout the value-chain including those directly involved with the USAID program as well as key sub-sector actors identified by her colleagues and past Farmer-to-Farmer volunteers. Secondary data was collected through literature reviews.

V. The Global Shea Value Chain

A. Demand Side: Trends in Consumption

Shea is unlike many African agricultural exports in that it is used extensively by the producers themselves and domestic and international consumers. Within the producing region, shea butter accounts for nearly all vegetable fat consumed by rural populations. It likewise serves as an inexpensive alternative to refined imported cooking oils in urban settings (Elias, 2003; Fobil, 2007; and Perakis Fieldwork 2007). In Mali, the recent closing of several HUICOMA cottonseed oil processing plants (World Bank, 2007) has decreased supplies of cottonseed oil (historically used as a cheap cooking oil) on local markets, resulting in increased consumption of shea oil among both the rural and urban poor.⁸ Industrially refined and imported shea products from Europe are purchased by high-income domestic consumers and foreigners in boutique-like beauty shops and supermarkets found in major cities (Perakis Fieldwork, 2006 and 2007).

Shea was originally identified during the colonial period as an inexpensive substitute for imported palm oil in Western Europe (Elias, 2003). More recently, shea has been used primarily as a cocoa butter substitute (CBS) in European chocolate and confectionary production.⁹ This use alone accounts for approximately 90 percent of international sales.¹⁰ The remaining five to 10 percent of international sales are destined for the cosmetic and pharmaceutical industries. The latter industries are thought to have the greatest near-term growth potential, especially in the US, which does not allow CBS

8 HUICOMA has historically purchased cottonseed cake from the CMDT (Mali's sole cotton fiber and ginning company) and extracted cottonseed oil for sale on the local markets as a locally produced vegetable oil.

9 Shea has been allowed as cocoa butter equivalent (CBE) for many years in several European countries. In 2000, the European Union finalized a directive allowing 5% CBE in the production of chocolates (Directive 2000/36/EC, June 2000).

10 According to Fold (2000) "The price difference between cocoa butter and CBE (cocoa butter equivalent) is substantial, the former being up to five times more expensive depending on the quality of the cocoa beans and the CBE considered."

(Stathacos, 2004) While data on European and American imports of shea are weak, evidence suggests that thanks to the forces mentioned above, shea will continue to experience important and growing demand (10-20% per annum) in high-income countries (Stathacos, 2004).

Interest from the cosmetic industry is driven by research showing the benefits the unsaponifiable components of shea oil as part of women's daily "beauty routine".¹¹ In fact, Alander (2004) notes that: "the main reason for the use of shea butter in high-value cosmetic formulations is associated rather with the unsaponifiable components" (Alander, 2004). As will be discussed in a later section of this paper, the niche cosmetic and pharmaceutical markets demand the highest quality products, with food-safety remaining an important preoccupation for the European chocolate and confectionary industries. This highlights the transition noted by Chalfin (2004) of shea moving from an industrial product to a niche market product, thereby creating unique challenges for the development of this subsector.¹²

Most recently, shea has been caught up in a series of popular trends (see cited publications for a more in-depth discussion). The gender-specific characteristic of the shea production process contrasted against the monopsonistic oilseed processors has made shea a target for fair-trade purchasing initiatives by a host of socially conscious cosmetics firms (Elias, 2003). In industrialized nations, shea consumption has increased as a result of consumer shifts away from synthetic cosmetics, a phenomenon referred to as the "naturalizing" of consumption and "green" consumerism (Chalfin, 2004; Elias,

¹¹ Unsaponifiables is a group of chemicals credited with giving shea butter its therapeutic properties (Lovett et al., 2005).

¹² Chalfin (2004) notes that exotic or tropical exports often move in the opposite direction—from the particular to the masses. In such a scenario, quality requirements would likely start very high and gradually regress. In the case of shea, the opposite has occurred (just as in recent trends towards 'niche' coffee markets).

2003; Fold, 2000; and Stathacos, 2004).¹³ Shea is also popular amongst ethnic consumers in Western Europe and US (WATH, 2004). Alander (2004) projects that shea may also be targeted in the future for its nutritional properties in the field of functional foods.

B. Supply Side: Trends in Production

Shea trees are indigenous to the “shea belt” region of Sub-Saharan Africa. This region spans across nineteen countries and a variety of ecological zones.¹⁴ Shea trees are not cultivated, but are rather managed under local and informal land tenure arrangements in the region’s agroforestry parklands.¹⁵ Over three million West African women participate in the subsector (USAID, 2008). In Mali, where over two-thirds of all shea trees are thought to be found (“Etude pour la Promotion des Filières Agro-Industrielles”, 2001); most rural women residing in the “shea belt” participate in the production, processing (handling), and marketing of shea. Although Mali is believed to possess the most important shea nut (kernel) production potential, at 250,000 MT per year, Ghana is the region’s most important exporter (Lovett, 2004). Available data on production and trade levels are poor, and there exists no “world” shea butter or nut price (Fold, 2000).¹⁶ ¹⁷ Of the total estimated shea nuts collected from the region, over half

13 It has been noted that in the US, meager FDA supervision of what constitutes a “natural product” allows companies to include minute quantities of “African” or “natural” shea in their products and still highlight these ingredients on the label (Stathacos, 2004).

14 Countries within the “shea belt” include (in alphabetical order): Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Cote d’Ivoire, Democratic Republic of Congo, Ethiopia, Gambia, Ghana, Guinea Conakry, Guinea-Bissau, Mali, Niger, Nigeria, Senegal, Sierra Leone, Sudan, Togo and Uganda (Holtzman, 2004).

15 Agroforestry parklands are the venues of land-use systems and technologies where woody perennials (trees, shrubs, palms, bamboos etc.) are deliberately used on the same land management unit as agricultural crops and animals, in some form of spatial arrangement or temporal sequence. In agroforestry systems there are both ecological and economic interactions between the different components (Bonkougou, et al., 1994).

16 References to several of the studies conducted by USAID’s West African Trade Hub (WATH) are found in the bibliography to this paper and can provide interested readers with approximations of such numbers.

are consumed locally. In Mali, this figure is closer to 65 percent (Holtzman, 2004). The result is the presence of competing production and marketing channels: one for the domestic rural poor and the other for high-income foreign consumers.

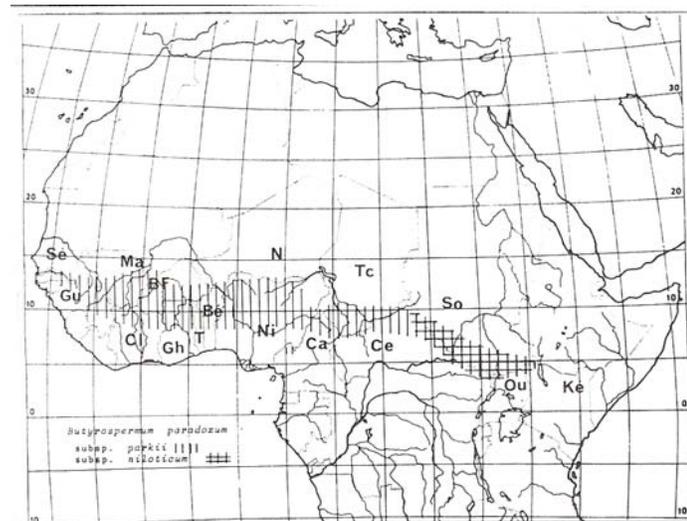


FIG. 1. — Répartition du karité en Afrique.

Figure 1: The Shea Belt (Sallé, G. et al., 1991)

Two species of shea trees are found within the region: *Vitellaria paradoxa* (or *Butyrospermum parkii*) and *Vitellaria nilotica*. *Vitellaria paradoxa* trees are found on the Western side of the “shea belt” (including Mali) while *Vitellaria Nilotica* can be found in the East (predominantly Northern Uganda and Southern Sudan). Oil content and characteristics vary greatly within and between species and countries (Maranz, S. and Z. Wiesman, 2003; Prokarité, 2007; Sallé et al., 1991; and Vincenzo et al., 2005). International cosmetics firms appreciate the *Vitellaria nilotica* variety for its lower moisture content and free fatty acid levels (Fintrac, 2002). Civil unrest within production and processing zones has recently made this product largely unavailable (Russo and Etherington, 2001).

17 Shea prices do generally follow cocoa prices, a reflection of the extensive use of shea as a cocoa butter substitute (Chalfin, 2004).

Three oilseed processing firms dominate (over 95 percent of trade) the international shea market, including two European firms (Aarhus-Karlshamn and Loders-Crocklaan) and more recently, Fuji Oils of Japan (Derks and Lusby, 2006).¹⁸ They exert their influence over the African shea market by setting prices (as a function of world cocoa prices) and quantity and quality criteria (Fold, 2000; Personal communication with Bamako exporters, 2006). These companies usually prefer to import whole shea kernels and undertake the refining process overseas. This is believed to serve as a quality control mechanism, as the quality of shea butter is easily compromised by artisanal handling, oil extraction, and storage methods (Harman, J. and Lah, K. Personal communication, 2007; Elias, 2003).¹⁹

Some companies have established direct or preferred-supplier relationships with producers in West Africa (Arhus in Ghana and the Ivory Coast, Fold, 2000; Burkina Faso, Elias, 2003). These relationships are designed to help to ensure (1) “Quality @ Quantity” for the oilseed processing firms (Lovett, 2004) and (2) differential payment for quality to producers.²⁰ Cosmetic firms generally demand the highest quality products available and have also established similar relationships with their West African suppliers (including Occitane in Burkina Faso and the Body Shop in Ghana).

¹⁸ In 2007, several new firms entered the market (WATH, 2008).

¹⁹ Artisanal production practices are traditional and yield limited quantities (Merriam-Webster, 2008).

²⁰ “Quality @ Quantity” is a term used by Peter Lovett of the West African Trade Hub (WATH). This describes the requirements of the larger traders and oilseed companies: a large quantity of high quality products. Presumably, the large quantity requirement is a mechanism for reducing the transaction costs involved with sourcing from a large number of smaller producers.

C. International Institutional Setting

Asymmetric Institutional Settings at Opposite Ends of the Value Chain

Institutional asymmetries at opposing ends of the value chain define the shea value chain— with informal institutions driving the primary processing of shea products in the “shea belt” and formal institutions dictating international trade and international consumption of value-added products containing shea butter.²¹ To illustrate, currently “there are no formal standards governing the exchange of goods between shea nut collectors, exporters and cocoa butter equivalent (CBE) manufacturers” (Fold, 2000). Historically, informal rural institutions drove all aspects of shea tree protection and maintenance, shea fruit collection, shea nut drying and processing, marketing, and consumption. Since the expansion of the use of shea butter as a CBE, there has been a sharp rise in the role of formal international institutions—embodied mainly in various private grades and standards developed by a handful of foreign oilseed processing firms and a growing number of cosmetics firms. These were established with the interests of cocoa producers (i.e., the International Cocoa Organization, ICCO), foreign oilseed firms and foreign consumers in mind—far removed from the agroforestry parklands where shea trees grow and in a language foreign to that of the millions of handlers who are responsible for the primary processing and marketing of “women’s gold.”

²¹ Institutions here are broadly defined as the “rules of the game” dictating the production, marketing and consumption of shea based products.

Grades and Standards in the West African Shea Value Chain

There are currently no public grades and standards for shea butter and nuts.²² In West Africa, where these products originate, the standards used by Western oilseed companies (located in Europe and Japan) are “secrets of the trade,” and CBE manufacturers networks of buyers are equipped with “crude quality knowledge” (FINTRAC, 1999; Fold, 2000; Perakis, Fieldwork, 2007). These *private* agri-food standards have not been neutral in their effects (Bingen, 2002). Instead, they have led to the pejorative labeling of shea *made in Mali*. While the marketing of shea to traditional consumer channels (rural markets) relies heavily on reputation established via repeated encounters between buyers and sellers (Perakis, Fieldwork, 2007), information costs are high in the global agri-food system (Staatz, Lecture, 2007). This component of the value chain can also be characterized as exhibiting asymmetric market power (concentrated in the hands of village level traders at the micro-level and monopsonistic oilseed processing firms at the macro-level).²³

This scenario is in strong contrast to the formal standards between the CBE manufacturers and European chocolate and confectionary manufacturers (Fold, 2000) and the worldwide trend toward increasing agri-food quality and safety standards of

22 In Mali, the Ministry of Commerce is responsible for setting and enforcing agricultural grades and standards through the Grades and Standards Division (Division de normalisation). To the author's knowledge, it has not established G&S for shea products. One organization, CONOESAM, has been involved in developing grading and to promote an “export quality label” for the regional cereal market. ROESAO (Network of Economic Operators in the Food Industry), a regional trade organization, is also involved in creating harmonized regional grades and standards. Shea is one of the five subsectors under its mandate (<http://www.mistowa.org>).

However, the author is unaware of its presence or effectiveness on the national level in Mali.

23 Anecdotal evidence suggests that the private grades and standards are not entirely conveyed to marketing agents in the value chain by international oilseed processing firms so that the latter can (1) maintain explicit market power and (2) take advantage of hold-up type situations. For example, once the goods are produced and exported, receiving firms can make false quality claims and pay accordingly because producer groups and exporting agents are often not fluent in the language of international contract law and given the perishable nature of shea products, they may lose all value if returned to their country or region of origin (an example of asset fixity).

international buyers— a reflection of growing concerns of consumers in high income countries (food safety standards, and traceability) (Bingen, 2006; Lovett, 2004; Otsuki et al., 2001; and Reardon et al., 1999). Today’s construct of shea quality is at odds with traditional ones, reflecting the power structures of the global agrifood system.

The West African Trade Hub (WATH), in collaboration with the United Nations’ Common Fund for Commodities (CFC), the Economic and Monetary Union of West African States (UEOMA), the Ghana Board of Grades and Standards (GBGS), the African Organization for Standardization (ARSO), and the sub-regional project Prokarité, has proposed various export guidelines and regional standards for the shea subsector in an effort to remedy some of these asymmetries. The Prokarité project intends to help “establish regional and international standards of shea product quality, with reference both to shea kernel and shea butter, as a basis for enhanced ‘traceability’ along the supply chain” (ProKarité, 2006). The stated objective is to help “facilitate domestic, regional and international trade in shea nuts and butter” (Prokarité, 2006). A verifiable system of grades and standards allows for the description of a product based on a specific set of characteristics. The rationale for such an undertaking is presumably that “increased standards of quality, accompanied by systematic methods of evaluation and verification, theoretically should benefit producers” (Stanford, 2002)—when bolstered by government, industry, producers, other marketing actors, and consumers alike. Formal grades and standards coupled with quality testing mechanisms administered by a credible actor in the value-chain would likely help to overcome many

of the information asymmetry issues which have led to both moral hazard and adverse selection, and resulting in suboptimal performance outcomes.²⁴

To examine this issue, the following paragraphs first discuss some of the pros and cons of public versus private grades and standards. Next, they present some international guidelines for the export of shea products including (1) a description of current quality assurance mechanisms and costs and (2) a list of environmental and cultural factors affecting shea quality. Third, they examine WATH's proposed quality benchmarks, and fourth, they describe the CFC's proposed regional grades and standards, which are currently under review with the assistance of UEOMA, GBGS, and ARSO, in addition to public and private actors in participating countries. This section ends with a discussion of some potential downfalls of the proposed regional grades and standards and potential solutions.

i. Introduction to Private vs. Public Grades and Standards in the Global Agri-food System

In developing regions such as West Africa, public grades and standards are often very weak. In most cases they are (1) not extensively developed, existing only for a few goods, such as highly politicized export crops (cotton) or staple food commodities like maize or (2) weakly monitored or enforced. In the case of relatively high-valued exported commodities such as shea, global demand for grades and standards in downstream marketing activities has often outpaced their public provision upstream (Reardon et al., 2001; Reardon et al., 1999). It is in this context that international agribusinesses choose to use voluntary private agricultural grades and standards when procuring inputs of production in a developing country context.

²⁴ This is analogous to the role of having a used car checked by a mechanic in Akerlof's used car market.

Box 2

Grades and Standards: Some Definitions

Standards are “rules of measurement established by regulation or authority”

Grades are “a system of classifications based on quantifiable attributes” (Jones and Hill, 1994 quoted in Reardon et al., 2001) with the objective of reducing the variance of economically important characteristics within a given lot (Staatz, AEC 841, 2007).

Private food and agricultural standards are created by firms to (1) streamline production and marketing of their goods, in the spirit of traditional grades and standards (the transaction cost, TC, approach) when they are sourcing from a wide variety of producers (i.e., they are not fully integrated and need to find a way to cut down on TCs at various points in the marketing chain), (2) create more flexibility in responding to consumer demands than public grades and standards allow (Henson and Reardon, 2005), (3) respond to increasingly stringent consumer demands for “credence goods” (Reardon et al., 2001), and (4) differentiate themselves by creating brand specific quality assurance seals.

Publicly enforced and monitored grades and standards can be characterized as being non-discriminatory in that they serve to help level the playing field among actors (i.e., they are inclusive). This cannot be said for private (or voluntary) grades and standards, which are exclusive in that (1) often only a small number of suppliers are equipped for them and (2) they serve as a mechanism for asymmetric market power to lead to asymmetric gains (and losses) among value chain actors (Reardon et al., 1999; Staatz, AEC 841 Lecture, 2007).

The CFC's move to establish regional voluntary grades and standards for shea butter and nuts and a regional quality certification system is a response to current market power asymmetries. Primary-producer groups, marketing agents, donors and technical assistance entities (such as NGOs) understand that those engaged in the Malian shea value chain are both "price and G&S takers" (Reardon et al., 2001) when they export their goods overseas to oligopsonistic buyers.²⁵ The creation of a regional system of grades and standards may help to improve the marketing power of shea nut and butter marketing actors in West Africa by equipping them with their own quality assurance seal.

International Guidelines for the Export of Shea

Grading and sorting based on "traditional" perceptions of quality of nuts and butter for sale are practiced at the individual producer and producer association levels. International buyers, on the other hand, often require third-party verification of product quality when making bulk purchases, in advance of an order. This third-party verification requires detailed laboratory analysis signaling a specific quality level to the international buyer (Lovett et al., 2005). The cost to test samples of shea butter varies from 10 to 20 dollars up to 100 to 600 dollars depending on the entity conducting the analysis and criteria verified (Perakis, Fieldwork, 2007). Discussions with producer groups, traders and exporters revealed that third-party verification typically does not occur in Mali. Rather, quality is often determined via laboratory testing in Burkina Faso, Ghana, or in Europe (and potentially even after the goods leave the country). In such analyses, the

²⁵ An oligopsony is a market in which there are only a few buyers but a potentially very large number of sellers (Rutherford, 2002). In reality, the oilseed processing firms exert both oligopsony market power upstream and oligopoly market power downstream (selling their refined shea oil to a large number of diverse buyers). This component of the international market dynamics is likely difficult to overcome given shea's status as a substitute, with very high price elasticity of demand.

characteristics shown in tables 1 and 2 may be verified, including characteristics caused by “environmental” and “cultural” factors.²⁶

Table 1. Examples of Quality Criteria of Shea Products Based on Biological or Environmental Factors	
Fatty Acids	In shea, these are mainly stearic, oleic, palmitic, linoleic, and arachidic acids, and they define the “oil profile” and melting point.
Unsaponifiables	Group of chemicals credited with giving shea butter its therapeutic properties (i.e., vitamin content and moisturizing and conditioning properties). High levels are preferable for cosmetics and pharmaceuticals.
Sources: Lovett et al., 2005; FINTRAC, 1999; Sénou et al., 2006; Alander, 2004.	

Table 2. Examples of Quality Criteria of Shea Products Based on Cultural Factors	
Free Fatty Acids (FFAs)	Indicative of degradation
Peroxide Value (PV)	Indicative of degradation, possibly causing malodorous ketones and aldehydes. Formation often caused by heat, metals (including iron and copper) and ultraviolet light.
Polycyclic Aromatic Hydrocarbons (PAHs)	Form during smoking or roasting over open wood fires. PAHs are known carcinogens and regulated under US and European food legislation. ²⁷
Moisture Content	Often the result of the storage method utilized.
Insoluble Impurities	Usually the by-products of oil extraction. Careful filtering can remove or reduce these levels.
Foreign matter	Resulting from storage, handling or transport practices
Sources: Lovett et al., 2005; FINATRAC, 1999; Perakis, Fieldwork, 2006.	

²⁶ “Environmental” factors consist of components that depend on the environment in which the shea trees grow and their individual genetic make-up, while “cultural” factors depend upon how the shea nuts and butter were processed, handled and stored.

²⁷ EC Commission Regulation no 1881/2006 allows 2 micrograms per kg in a wide range of vegetable oils.

Proposed Regional Standards for the Export of Shea

Benchmark Standards for Shea Nuts

As discussed previously, individual companies specify their own quality standards for purchases of shea nuts. The West African Trade Hub (WATH) and the Union Economique Monétaire Ouest Africaine (UEOMA) have proposed future definitions for public shea standards. Table 3 shows the proposed benchmark for the composition of the shea nut required for export, as described by USAID's West African Trade Hub (WATH):

Free Fatty Acid (%)	≤ 6
Moisture Content (%)	≤ 7
Oil/Fat Content (%)	≥ 45
Latex (%)	4-10

Proposed UEOMA (Union Economique Monétaire Ouest Africaine) Standards for Shea Nuts, Kernels and *Unrefined Butter*²⁸

As part of current attempts to formalize shea standards in West Africa, the Union Economique Monétaire Ouest Africaine (UEOMA), in collaboration with the United Nations' Common Fund for Commodities (CFC) and the regional project ProKarité, has proposed the grades, standards and guidelines shown in tables 4 and 5. These proposed public, regional grades and standards are currently under review by stakeholders. Once agreed upon, it will be the responsibility of individual countries to implement, monitor, and enforce these standards, which would apply to both exported

28 Observations du CTR sur la Norme Régionale de l'Afrique pour le Beurre de Karité (non raffiné)
http://www.normeskarite.net/CTR_commentaires.html (2007).

and domestically consumed products (Masters, E. Personal Communication, 2008). Private firms will continue to be at liberty to impose stricter private standards, and although it is understood that each grade will correspond to a different priced good, UEOMA does not encourage or plan to be involved in national pricing policies (Masters, Personal Communication, 2008).

Table 4. UEOMA's Proposed Standards for Export-Quality Physical Characteristics of Shea Nuts (un-shelled) and Kernels (shelled)		
	Shea Nuts	Shea Kernels
Free Fatty Acid (%)	Max 3	Max 3
Broken/rotten (%)	Max 10/5	10/5
Fat content (%)	Min 40	40
Moisture content (%)	Max 9	8
Impurities (%)	Max 1	1
Source: UEOMA, 2006		

Table 5. UEOMA's Proposed Grades for Export-Quality Physical Characteristics of Shea Butter			
	1st Grade	2nd Grade	3rd Grade
Free fatty acid (%)	Max 1.0	1.1 - 3.0	3.1 - 8.0
Peroxide value (mEq)	Max 10.0	11.0 -15.0	15.1 - 50.0
Moisture content (%)	Max 0.05	0.06 - 0.20	0.30 - 2.00
Insoluble impurities (%)	Max 0.09	0.10 - 0.20	0.30 - 2.00
Source: UEOMA, 2006			

Three proposed shea butter grades are currently under review by interested stakeholders. Ideally, each grade will correspond to a different price to ensure compensation for quality thereby beginning to align producer incentives. From table 5, unrefined shea butter of 1st Grade can serve the needs of the cosmetic and pharmaceutical industries, and for direct consumption. Unrefined shea butter designated as 2nd Grade can serve the needs of the food industry (confectionery,

chocolate, edible oil, or as a basis for margarines), while unrefined shea butter considered 3rd Grade can serve the needs of the soap-making industries, or be further refined for direct consumption (Lovett et al., 2005).

Discussion

While the above proposed grades and standards are an improvement from the current situation, several questions remain. The analogies presented in section VI suggest that special attention must be paid to a host of factors, including (1) the level of differentiation between grades based on economically important characteristics to downstream marketing actors, (2) how information on these public or regional standards is disseminated and to whom and (3) actors' capacities to meet such standards. Together, these will determine the effectiveness of such a system and subsequent market performance outcomes (including both pricing efficiency and quality).

First, although these are regionally agreed-upon grades and standards, implementation, monitoring, and enforcement will be the responsibility of individual countries. Four West African countries formally started this process, and Mali is not one of them (Masters, Personal communication, 2008). It is understood that one of primary objectives of UEOMA's proposed grades and standards is to help facilitate international shea trade. These grades and standards will apply to both domestically consumed and exported products. Yet in Mali, the relative importance of the export market is very small (between 10 and 25 percent of total production). A scenario in which growers producing for the national market are, on the one hand, forced to adhere to new rules designed to improve quality, and on the other, receive no tangible economic benefit as rural consumers are not yet interested in "paying for quality," is certainly something to

be avoided (Stanford, 2002). Possibly, the development and implementation of a system of grades and standards in neighboring countries may be to the detriment of Malian shea producers and result in either damaged trade relations or producers from neighboring countries selling their lowest quality products in Mali.

Second, benefits from the transparency achieved by the harmonization of regional standards for shea nuts and butter will likely only be accessible to those with high levels of market information.²⁹ For example, advanced and expensive laboratory testing is also required to verify the above quality measures. As such, quality is verified and remunerated at a point in the marketing chain well beyond the quality-determining handlers, thereby reducing the important effects on incentives felt by primary, village-level producers. Village-level incentives are necessary to *improve* quality, while downstream incentives can only maintain it.

Third, in addition to the above proposed grades and standards, village-level shea quality testing and evaluation criteria as well as pricing arrangements which effectively align producer incentives must be addressed for overall quality to improve and for village-level primary handlers to benefit. Actors within the marketing chain also need to negotiate over which buyers and sellers need to abide by such grades and standards. The technical aspects of potential quality testing and verification mechanisms are beyond the scope of this paper. The paper's analogies section provides insight into how pricing arrangements coupled with these proposed standards may help ensure pricing efficiency for primary village-level handlers.

²⁹ Including large producer groups, private firms, and exporters.

VI. The Malian Case

Although this section describes the subsector's structure, conduct, and performance (SCP) for the case of Mali, much of this material reflects realities in other shea producing countries.

A. Subsector Structure

i. Biological Characteristics

Production Potential

Two-thirds of all shea trees are found in Mali ("Etude pour la Promotion des Filières Agro-Industrielles", 2001), with high concentration in the areas of Ségou, Koulikoro, Sikasso and Kayes. Annual production of dried shea nuts is estimated at 150,000 tons (Derks, 2005), although production potential has been estimated at 250,000 tons (Lovett, 2004). These numbers are subject to substantial annual variation due to rainfall variability, the production cycle of shea trees, and yearly changes in the management of the agroforestry parklands where shea trees grow (Sallé et al., 1991). Since 2000, average annual exports are estimated at 8000 tons of dried nuts (having undergone primary processing) and 500 tons of shea butter (having undergone secondary processing). Data are poor, scarce, and often contradictory. The values above should therefore be taken with a grain of salt.

Seasonality

Shea nut collection and processing are highly seasonal activities. Shea fruit ripening and collection coincide with the annual rainy season during which rural women are

occupied by on-farm activities.³⁰ Evidence suggests that the “shea season” varies by agroecological zone (for example, the 2007 “shea season” was earlier in the Southern Sikasso region than in the Northwestern Kita region) (Peace Corps volunteers, personal communication, 2007). The fruit are highly perishable and must be collected and undergo primary processing (or, in most cases, storage) within 48 hours of harvest.³¹ This seasonality in production in turn leads to variable shea nut and butter prices and supply over the course of the calendar year (prices dip over the course of the rainy season, May until August, and gradually increase as stocks deplete until the following May) (“Etude pour la Promotion des Filières Agro-Industrielles”, 2001; Perakis Fieldwork, 2006).

Shea Tree Distribution

There are approximately 94 million shea trees in Mali (“Etude pour la Promotion des Filières Agro-Industrielles”, 2001), with large variation in the distribution of trees within and between agro-ecological zones (APROMA, 1993; Maranz and Wiesman, 2003; Sanou, H. et al., 2006). Zones with particularly high tree density (per hectare) include San (up to 40 trees per hectare) and Ségou (up to 50 trees per hectare) in the country’s semi-arid region; Dioila, Bamako, Koulikoro and Kita (up to 50 trees per hectare) in the sub-humid region; and Kenièba (up to 40 trees per hectare) in Mali’s humid region (APROMA, 1993).

30 Women are either directly or indirectly engaged in on-farm activities. Although they may not find themselves in the fields, they are actively engaged in complementary activities like preparing materials and food.

31 The fruit are generally allowed to ripen and fall to the ground prior to collection.

ii. Subsector Organization and Actors

Land Tenure Arrangements

Shea trees are implicated in a variety of dynamic land-tenure arrangements. For example, shea trees are often protected under local land tenure arrangements within the commons of rural communities (Doumbia and Keita, 1987), with women's access varying by local customs and norms (Elias and Carney, 2005). In some areas, village chiefs may allocate shea collection rights, while in other areas, land owners may determine who has access to trees in fields and fallow lands (Becker, 2000). The recent land allotment ("allotissement") phenomenon in urban areas may have important implications for tree management and conservation as shea trees found within family-owned plots of land where tree protection and maintenance depends on the importance of shea fruit and for household nutrition and income.³² This phenomenon may in turn have a detrimental effect on both women's access to shea trees and the health and size of the shea tree population in Mali's urban and periurban areas.

Market Organization and Actors

The Malian shea subsector can be characterized as pyramid-like, with a large number of small and atomized female primary producers, many traders and middlemen, and very few exporters. Important gender roles and dynamics are also defining characteristics of the subsector. The interdependent relationships between each of these actors depend on complementary markets such as the transport sector and credit markets. Both the Malian government and the international community (including donors and NGOs) have played roles in the development of this subsector, while local research institutions,

³² Under "allotissement", or land allotment, communal land is partitioned to individual owners.

such as the Institut d'Economie Rurale (IER) and ICRAF, have conducted research and provided technical assistance to primary producers of shea in Mali, with the objective of improving the quality of Malian shea butter and nuts as well as returns to producers.

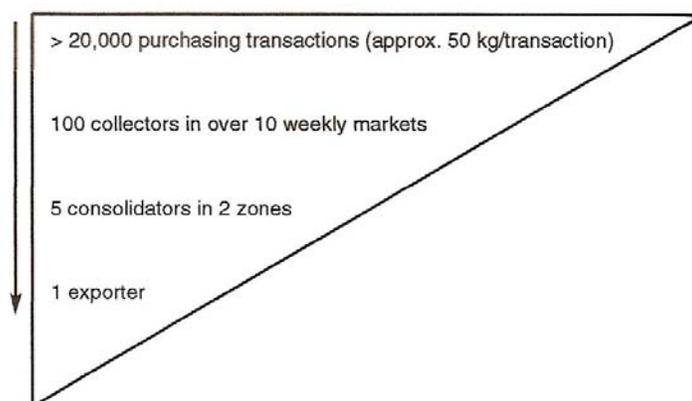


Figure 2. Typical trading network to collect 1000 tons of shea kernels

Figure 2: Stylized Partitioning of the Malian Shea Value Chain (Lusby and Derks, 2006)

High Information, Transaction, and Transfer Costs

As mentioned previously, the Malian shea sector is plagued by high information, transaction, and transfer costs. To date, there is no widely used or accepted method to check shea quality at the village level.³³ This has in turn created a lack of trust among actors due in part to the current inability of traders to provide differential payment for quality, a structural issue which is perpetuated by poor market performance. High physical transfer costs (including the cost of overland transportation and tariffs imposed by neighboring port countries) contribute to the low prices paid to Malian primary producers and exporters (“Etude pour la Promotion des Filières Agro-Industrielles”, 2001). Shea nut and butter producers likewise rely heavily on poorly functioning rural credit markets to make investments, buy shea nuts for butter production, and participate in spatial and temporal

³³ Please see the previous section of this paper for an in-depth discussion of this point.

arbitrage. Much like shea traders and wholesalers, the informal and high-cost transport sector and rural credit market play a linking role between the stages of production and marketing.

The Role of Women

Historically, the primary handling of shea (including the collection of shea fruit, drying of the nuts, and processing of nuts into butter) has taken place solely within the sphere of *women's* work. Although revenues from shea sales make an important contribution to rural women's cash income in Mali's shea producing areas, shea is a secondary activity, given women's competing on-farm or intra-household seasonal time constraints, which depend largely on the crops under cultivation (DeGroot and Coulibaly, 1998; Elias, 2003; McGlinchy, 2006; Perakis, Fieldwork, 2006 and 2007).

Women often sell their nuts and butter at the local market to other women, village level traders, or to local village-level associations or cooperatives.³⁴ Individuals are price takers, as market information (such as prices) is scarce, they have difficulty participating in arbitrage, and shea is usually sold for the sole purpose of paying for household necessities such as children's school supplies and cooking ingredients—a result of household income partitioning practices.

Determining the nature of women's work and competing time constraints during this season is an area for future investigation, as (1) this varies by agro-ecological zone and (2) it is possible that developing labor- or time-saving technologies in other subsectors may free up additional time for women to devote to shea handling in line with the demands of high-income consumers. Such technologies are an especially

³⁴ The role of cooperatives will be discussed extensively in the following sections of this paper.

salient issue, as shea has been dubbed an “underexploited resource” (Addaquay, 2004; NRC, 2006) because of the labor constraints placed on women during the “shea season.”

The sharp increase in shea prices during the 2007-2008 growing season incited an increase in interest in the primary handling of shea fruit and nuts by men in rural areas, potentially affecting land tenure and tree management practices. Shea revenues the 2007-2008 season permitted farmers to stock their cereals after harvest (as opposed to selling them) and selling them later in the season, at a better price with a potentially positive effect on household incomes and food security (OMA, 2007). It remains to be seen whether the gender dynamics of participation and organization change as a result of this “boom.” This phenomenon may compromise women’s access to shea trees and their cash revenues from shea sale in the future.

Traders, Wholesalers, and Exporters

In Mali there are thousands of traders and about 20 wholesalers who double as exporters of shea butter and nuts (Derks and Lusby, 2006). As discussed by Abbott (1987), traders play important roles such as putting cash in the hands of primary processors, stocking, transporting of products over long distances and identifying potential market outlets. In Mali, they link the remote and highly atomized primary village level producers and urban exporters and processors, extend loans, and play a role as a technology transfer and innovation node.³⁵ Wholesalers rely on traders to procure shea butter and nuts from rural markets. Traders buy from either individual women at weekly markets or from cooperative groups and transport, store and resell shea nuts and butter to urban

³⁵ For example, some traders and wholesalers do not pay cash for shea nuts, but rather with capital or expensive (or hard to find) complementary supplies (Perakis, Fieldwork, 2007).

entrepreneurs, exporters and industrial processors. These actors are often part of a well-connected network and benefit from their highly mobile disposition to participate in temporal and spatial arbitrage.

Government

The public sector has the potential to play a vital role in Mali, as it is likely the only entity capable of playing the role of channel captain or of implementing a national-scale campaign for improving the quality (and reputation) of Malian shea. The Malian government has exhibited some recent interest in developing the shea subsector. However, efforts have been relatively hands-off when compared to Burkina Faso since the mid 1990s (see the Analogies section of this paper for an in depth discussion of the shea in Burkina Faso). Activities funded by the Malian government have been in the areas of cooperative organization, capital investment, and research. Efforts have been dispersed and not part of coherent or comprehensive plans to improve the subsector's performance outcomes on a national scale.

Through intervention at the producer group level (a key leverage point), Œuvre Malienne d'Aide à la Femme et à l'Enfant au Sahel (OMAFES) originally promoted the organization of cooperatives in this subsector in the late 1990s-early 2000s. The Ministère de la Promotion de la Femme et de l'Enfant (MPFEF) has recently supported cooperatives in the production and marketing of industrial-grade shea butter in highly centralized areas (Malécaux, personal communication, 2007). The high cost relative to quality of industrially manufactured Malian shea butter precludes it from being competitive on the international market.³⁶ The Institute d'Economie Rurale (IER), a research arm of the Malian government,

³⁶ For example, many of the factories shut down regularly due to high energy costs.

has worked toward developing solar shea nut dryers, improved shea tree varieties, and village-level quality testing mechanisms. These efforts are still in the experimental phase.

Donors and Non-Governmental Actors

The international community (including donors and donor-funded NGOs) has promoted the Malian shea value chain for many years. Activities include: (1) organizing women into producer cooperatives and federated unions of cooperatives; (2) providing primary producers with information regarding the processing methods required to produce export quality butter as well as the credit and capital required to do so; (3) providing exporters with technical training in the areas of quality assurance, creating business linkages with foreign buyers, and identifying markets; (4) assisting with research in the areas of improved shea tree varieties and village level quality testing mechanisms; (5) agroforestry parkland management and tree maintenance; and (6) alternative shea product development (such as soaps and lotions). Donor- and NGO-funded activities are generally very geographically focused—designated for projects in specific regions of the country. For this reason, they are not included in the subsector map provided below. Their presence is nevertheless felt by actors at all levels of the value chain.

Marketing Channels

The majority of Malian shea is produced by women for the purpose of household consumption and is not marketed. Holtzman (2004) estimates that less than 35 percent of shea products produced in Mali are exported. The author has identified several marketing channels for individual producers, cooperatives, traders and exporters in Table 6 (Perakis, Fieldwork, 2006 and 2007). Primary producers sell their products to local cooperatives or at village-level markets to traders or directly to rural consumers. Unions rely on many of the

same marketing channels, although they appear to be more export-oriented. These actors may also further processing shea butter into soap for sale on the domestic market to either high-income consumers who shop in boutiques, urban sales kiosks or supermarkets, or to local hotels.³⁷ Currently, many Malian hotels provide complimentary Burkinabé soaps, making this a potentially lucrative market. Consumers purchase shea nuts, butter, and shea-based soaps and lotions from individual producers, traders, and cooperatives at village-level weekly markets, urban markets, supermarkets, retail kiosks (in urban areas or along major roads), and hotels.

³⁷ The soaps the author came across were artisanal in nature and generally not of “exportable quality,” especially when compared to the quality of Burkinabé and Ghanaian soaps available within the region.

Figure 3 Malian Shea Sub Sector Map (Perakis, Fieldwork, 2006)

Differences in quality desired by domestic consumers and international (export) markets has resulted in competing product channels

Domestic Market: 2nd quality shea nuts and butter used for cooking, soaps, lotion and as a “cure all.”

International Market and High Income Domestic Market: 1st quality shea nuts and butter used as ingredients in confectionaries, pharmaceuticals and various beauty products.

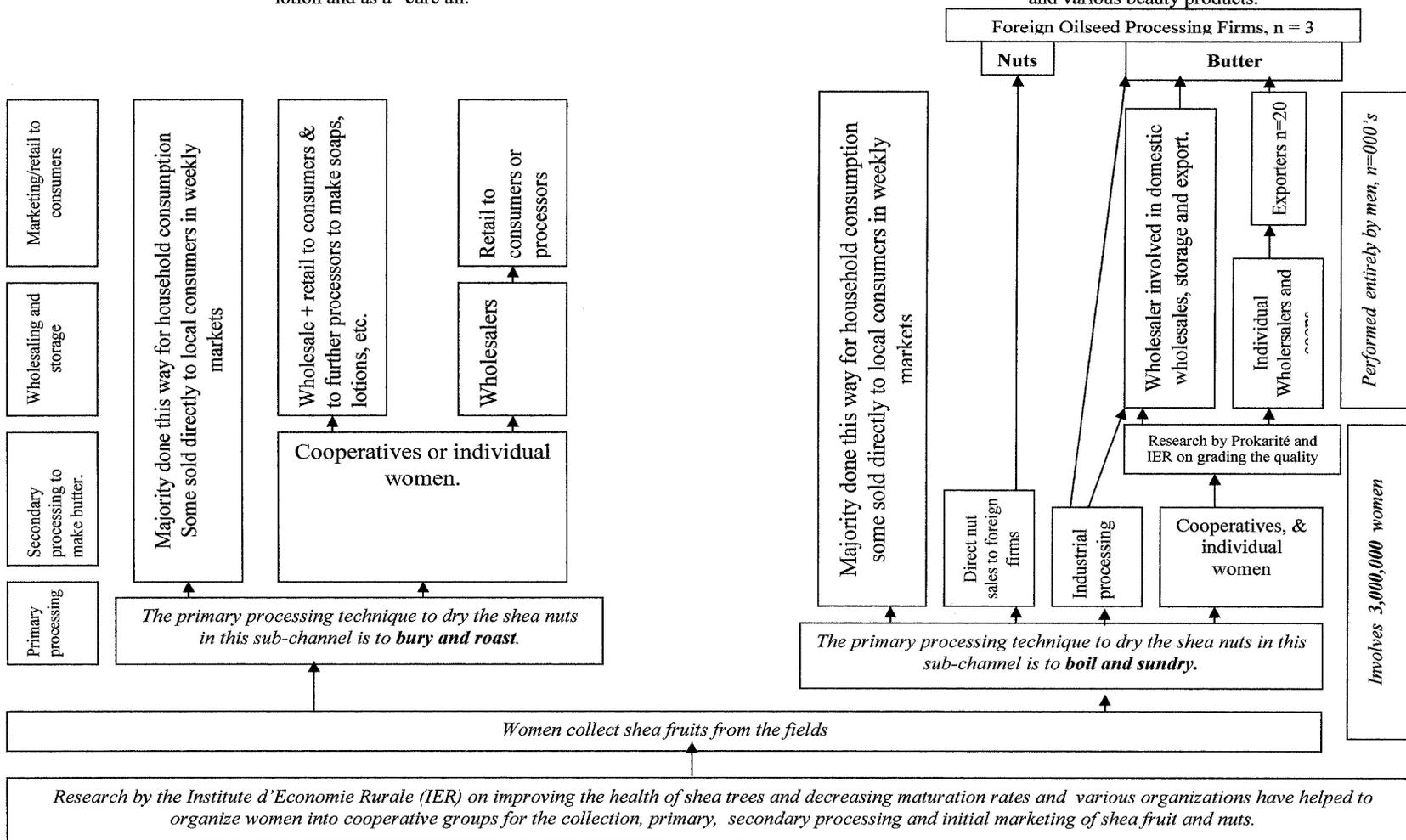


Table 6. Shea Marketing Channels by Subsector Actor					
Actor	Gender	Location	Number	Product(s)	Channel
<i>Individual Producers</i>	Female	Rural	Hundreds of Thousands	fruit, nuts, butter	Personal consumption, local markets (to individual consumers or traders), cooperative or association
<i>Associations & Cooperatives</i>	Female, some males	Rural and Urban	Thousands	nuts, butter, soap	Local markets (to individual consumers or traders), traders, exporters, retail kiosks (urban & along major roads), supermarkets (urban), hotels
<i>Traders</i>	Male	Rural and Urban	Thousands	nuts and butter	Private entrepreneurs, exporters, industrial processors (limited)
<i>Entrepreneurs & Industrial Processors</i>	Male	Urban	< 100	butter, soap, lotions	Boutiques, supermarkets, hotels, downstream traders, directly to European oilseed processing firms
<i>Exporters</i>	Male, some females	Urban	< 100	nuts and butter	Burkina Faso, Ghana, Cote D'Ivoire, Senegal, directly to European oilseed processing firms
<i>Supermarkets, Urban Boutiques, and Hotels</i>	Male	Urban	<100	butter, soap, lotions	Urban elite, tourists and expatriate community
Sources: Perakis, Field notes, 2006 & 2007; Derks, 2005; Lusby and Derks, 2006					

iii. Shea Handling and Processing Methods

Although shea trees exhibit high levels of genetic variation, most analysts accept that the quality of shea nuts and butter depends first and foremost on the collection, drying, and primary processing (handling) methods utilized by rural primary producers. It is therefore at the village level that the subsector's competing production channels originate. Given the role of handling methods on final product quality, the following paragraphs describe some of the more widespread handling methods. The stages of oil extraction are universal—depulping, drying and storing the nuts, and extracting the oil—and are considered part of the subsector's structure. However, primary handlers' choices of techniques to carry out these stages are a reflection of the incentives they face as a result of market actors' conduct. Later sections provide details on the incentives driving producer behavior and related market performance outcomes.

Shea Nut Drying and Processing Methods

Once rural women collect the shea fruit, the nuts are depulped in preparation for drying in one of two ways. This may occur immediately when men, women, and children consume the fruit as an important source of energy and micronutrients during the lean season, when foods stores are depleted (Elias, 2003; Hyman, 1991). The fruit may also be stored in piles or buried holes within family compounds or in the fields where many women spend their days working. This allows women to collect the fruit as they ripen, but wait to begin handling the shea until after the rainy season workload subsides. Depulping occurs first via subterranean fermentation, which is known to compromise shea quality (Lovett, 2004) as it increases free fatty acid (FFA) levels and encourages seed germination.

In Mali, two shea nut drying methods are used to prepare nuts for storage, further processing, and marketing: “bury and roast” and “boil and sun-dry.” The nuts are dried to either sell or further process into shea butter. These practices are *artisanal*, leading to highly heterogeneous final products.

The dominant production channel is for “buried and roasted” nuts and, eventually, butter. It involves labor- and time-saving methods for drying and storing shea nuts. With the “bury and roast” method, the nuts are depulped via subterranean fermentation. Once women’s on-farm workload eases, or the butter is needed for consumption or sale, the nuts are then roasted in a chimney style-wood fire oven until they are sufficiently dried for storage or additional processing (Figure 4). Regional buyers purchase this quality of product, especially during years of very scarce supply (Keita, personal communication, 2007), to be purified at a later stage of the marketing chain. The final product is dark yellow and has a distinct potent smell.



Figure 4: Shea Drying Oven, Cercle de Dioila, Mali (Perakis, Fieldwork, 2007)

An alternative processing method, “boil and sun-dry,” is used by some rural women and is preferred by exporters and the international community. The oil from nuts that have undergone this processing method is called “beurre amélioré” (improved butter). This method is more labor-intensive and sensitive to the availability of additional inputs like clean

water and firewood, and it produces mild smelling shea nuts and butter, and embodies other physical properties desired by high-income Malian consumers and exporters (discussed previously).

First, the nuts are depulped by hand. Second, the shea nuts are boiled very soon after depulping to denature the enzymes present in the nuts, in preparation for drying and storage—requiring additional resources including time, clean water, and firewood (Lovett, 2004). This may also place additional stress on local water sources, forcing some women to travel farther from home to collect water for this process. Third, once sufficiently boiled, the nuts are laid out to dry either directly on the ground or on a mat. This can be a daunting task, as the nuts must be monitored to ensure that they do not accumulate excessive moisture from rainfall—which occurs frequently, as this activity coincides with the rainy season. This drying method can take many days to complete and requires consistent attention. Once the nuts are dry, the germination process has been halted, and the nuts can be stored (Elias, 2003).

Storage

Once dried, shea nuts are stored in a host of different receptacles. For example, if the nuts are going to be solely used within the household setting, clay storage bins or baskets stored inside mud storage huts found within household compounds are used. If the nuts are destined for association-level marketing efforts, they are stored in either plastic or burlap bags. The plastic bags are usually recycled bags from rice, maize, or millet, whereas burlap bags must be purchased. Burlap bags are recommended for storing, as they allow moisture to escape, reducing the possibility of pervasive molding

(Personal communication with traders, 2007), another source of possible quality deterioration.

Processing

This section describes some of the characteristics of manual, semi-mechanized and industrial shea oil extraction, or butter processing.

Manual

Manual, or traditional, shea oil extraction is an incredibly arduous task, requiring multiple day's worth of effort, large amounts of water, and fuel wood (see Elias, 2003; Hyman, 1991; Sallé et al., 1991). Individual women may complete the entire process alone, but shea oil extraction is often done as a group, involving women (of all ages) from within or between households to help "maintain morale" (Perakis, Fieldwork, 2006 and 2007). Group work inherently creates a monitoring mechanism for women engaged in cooperative butter marketing. This process begins with the shelling of shea nuts using a large mortar and pestle. Next, the nuts must be crushed. Historically, this was done with a mortar and pestle, but today, most women rely on village-level mills.³⁸ In Mali, this costs approximately 50 CFAF (US \$0.12) per 1.5 kg of nuts (Perakis, Fieldwork, 2006 and 2007).³⁹ The shelled nuts are then heated in a large cauldron and crushed again until they turn into a paste (Elias, 2003).

The kneading process is the next labor-intensive step. Water is added to the shea paste and kneaded; kneading is also known as the "rabbatage dance". This serves to separate the nut residue from the foamy oil, which in turn becomes shea butter. Shea butter quality and extraction rate are sensitive to the cleanliness of the water used and

38 Most villages have at least one diesel-powered mill that is privately owned and operated (Perakis Fieldwork, 2006).

39 1.5 kg fills the standard tomato sauce can found throughout the country (Perakis, Fieldwork, 2006 and 2007).

women's kneading methods (Lovett, 2004 and Elias, 2003). Given its time and labor intensiveness, it is not uncommon for wealthier women to hire younger women for the day to complete this step (Perakis, Fieldwork, 2007). The next step, "washing", has been identified as the most water-intensive in the shea butter extraction process. This entails placing the separated off-white oil into water, mixing it, again separating it from any residues or impurities, and repeating. Elias (2003) noted that shea butter produced for personal consumption or local sales is washed three to four times, whereas shea butter produced for the international market requires at least five washings. Prior to consumption and sale, the shea butter is brought to a boil to clarify and filter it.

Traditional manual shea nut drying and butter extraction processes are time-, labor-, fuel-wood- and water-intensive. For example, Elias (2003) estimated that eight hours of women's time are required, usually over the course of two days, to extract 2.5 kg of oil from 10 kg of shea nuts. Traditional oil extraction methods typically reach an extraction rate of about 20 percent (Addaquay, 2004; APROMA, 1993; Elias, 2003).⁴⁰ Hyman (1991) estimated that 8.5 to 10 kg of fuel-wood are required per kg of extracted oil for the manual (traditional) drying and extraction process. Addaquay (2004) estimated that processing 18 kg of nuts into butter requires 67 liters of water (3.7 liters/kg), whereas Mensah (2001) estimated that traditional drying and processing in Ghana required approximately 2 liters of water per kg of nuts processed.

⁴⁰ 100 kg fruit yields 20 kg kernels which yields 4 kg of butter via traditional methods (APROMA, 1993)

Semi-Mechanized

Semi-mechanized oil extraction involves the same steps highlighted above (crushing, heating, kneading and washing). The main difference is the scale and the increased role of mills at various stages of the oil-extraction process— achieving greater extraction efficiency. Export-quality shea butter is likely best achieved using a mill or multifunctional platform (MFP) owned and operated by either an entrepreneur or cooperative involved in shea butter extraction and marketing.⁴¹ This may (1) induce incentives that ensure the machinery is sufficiently maintained, (2) serve as an additional source of quality control, and (3) lower marginal costs. For example, when women rely on their village's single privately operated mill, its use is often (1) expensive, (2) available only on an ad-hoc basis depending on the character and humor of the operator, and (3) kept in unsanitary conditions. The same mill may be used to process corn, millet, sorghum, roasted shea nuts, and boiled shea nuts without being washed in between uses (Perakis, Fieldwork, 2006 and 2007). And, if a mill or MFP is simply given to producers without attaching some kind of ownership rights or residual claimancy, the maintenance of the machinery will likely be neglected.⁴²

⁴¹ Please see Box 3 for a discussion of MFPs, their current popularity, and uses.

⁴² As the residual claimant, they are more likely to maintain the machinery, as they are the recipient of profits from its use.

Box 3
Multifunctional Platforms (MFPs)



MFP owned and operated by COPROKAZAN, Zantiebougou, Mali

Multifunctional platforms (MFPs) consist of a diesel (or biofuel) powered engine, which serves as an energy source for various activities including: to operate various types of mills and pumps, to charge batteries, and to produce electricity. These are now popular amongst organizations particularly focused on achieving the third Millennium Development Goal (MDG) to “promote gender equality and empower women” (UN, 2008), such as the UNDP and UNIFEM, thanks to their labor-saving capacity in time- and labor-intensive tasks (such as shea butter extraction) in which women often engage.

Mills and multifunctional platforms require maintenance and some mechanical know-how. These machines, as well as various prototypes, have been introduced widely in Burkina Faso as a result of public-private-donor partnerships and in Ghana thanks to extensive government research into this domain via the cocoa marketing board (Fobil, 2007). In Mali, experimentation with oilseed extraction units was especially popular during the 1980s and early 1990s (Hyman, 1991). Machinery adoption at the time was low and maintenance was poor. Today, however, many of Mali’s largest producer cooperatives and unions as well as urban entrepreneurs are equipped with mills or MFPs that were acquired from donors, government projects, or cooperative profits (Perakis, Fieldwork, 2006 and 2007).

Industrial Processing

Industrial processing methods may achieve up to 80 percent extraction rate (Fleury, 1981). However, industrially dried shea nuts and processed shea oil from Mali are not competitive on the international market (Derks and Lusby, 2006) due to the low quality of shea nuts (i.e., raw material quality) and comparatively high production costs including the high costs of inputs, capital, energy, and imported containers used for marketing and overland transportation. This high cost has dissuaded most major investment (including FDI) in industrial processing, although oilseed extraction firms such as HUICOMA and SODEMA have ventured into this market in the past.⁴³ Several individual entrepreneurs, such as the Société Commerciale du Sahel (SCS), have purchased industrial oil extraction units from India (Perakis, Fieldwork 2007). Although many have established direct ties with shea cooperatives (to gain greater control over the quality of their inputs), shea nut quality continues to thwart such efforts (Perakis, Fieldwork, 2006 and 2007).

B. Conduct

The structural issues presented in the previous section have resulted in current conduct (or behavior) by subsector actors. This includes the lack of (1) adoption of improved handling practices, (2) differential payment for quality by traders, (3) partnerships between Malian producers and European oilseed processing firms, and (4) critical investments (human, capital or other) by subsector actors. In response to the subsector's

⁴³ The Ministère de la Promotion de la Femme et de la Famille introduced mechanical dryers as part of its 2004-2010 shea promotion project (Perakis, Fieldwork, 2006). However, these are only available on a limited basis (for example, one must somehow be implicated in a Ministry project to access to these dryers) and they rely extensively on electricity availability, which is not very practical in rural Mali.

structure, conduct, and performance outcomes, primary producers engage in cooperative organizations, most marketing actors pool their goods, and foreign oilseed firms prefer minimally processed shea nuts over butter.

Handling method choice

Primary shea nut handling takes place uniquely within the household sphere, and testing for quality is impossible at the village level, leading to the main source of information asymmetry, including both moral hazard and adverse selection in the Malian shea value chain. Women use the labor-saving methods passed down from generation to generation (Perakis Fieldwork 2006 and 2007). Some sources suggest variations occur along “ethnic lines” (Derks and Lusby, 2006), while others vaguely suggest they occur by “zone” (Perakis, Fieldwork, 2007). The method used can vary greatly within a village, or even within a household. It is therefore difficult to identify exactly which method is practiced, where, and for precisely what reasons.

Value-chain changes (Boehlje, 1999) in Mali have been largely driven by the evolving needs of high-income consumers at the top of Kinsey’s (1999) demand chain. Despite demands by the international community to modernize, labor-saving processing methods persist because few economic incentives are present for primary producers to change their production practices. The quality demands of the international community are at odds with the dominant “bury and roast” production method employed in Mali. This is consistent with the observation of Wessen (1998) that: “informal institutions are more tenacious and resistant to change since they are perpetuated through the cultural fiber. This means there is frequently a tension between altered formal rules, and persisting informal institutions.” Producers behave in a risk-averse manner and are hesitant to invest

additional time, energy, and capital if they are not certain to receive differential payment for quality.

The Malian shea subsector is a prime example of a situation in which “quality cannot be distinguished and rewarded and as a result producers make minimal investments in quality, since there are no payoffs in doing so” (Wessen, 1998). Several organizations (governmental, non-governmental and donor-based) promote “improved” shea handling methods—including shea nut drying, storage and oil extraction methods. Anecdotes from producer groups suggest that many donor-funded projects result in situations where producer groups receive training, but (1) are not linked with markets with differential payment for quality and (2) are paid above-market prices regardless of quality. In each of these cases, primary handlers are informed about handling methods, but economic incentives often do not induce their use.

Investments and Direct Marketing

The current lack of investments and direct marketing reflect high levels of perceived risk by downstream marketing actors. Foreign buyers have experienced repeated problems related to quality, quantity, packaging, and timing. As a result, producer groups rely primarily on large exporters and wholesalers in urban centers to undertake these activities, and European clients prefer to purchase shea nuts and process them with modern oilseed extraction technologies. This has also thwarted critical public and private investment in processing facilities, capital availability and accessibility, infrastructure, and labor-saving technologies in the shea sector (Derks, 2005). The performance outcome also represents a lack of progressiveness—unlike Burkinaabé, Ivorian and Ghanaian cases where major government campaigns promote improved handling methods (Lovett, 2004).

i. Cooperative Organization

In response to the structure of the Malian shea value chain, many women have joined producers associations or cooperatives. Women may even belong to several marketing organizations—a reaction to high levels of perceived risk in “putting all your eggs in one basket” or perhaps a response to varied support and technical assistance from donors and government projects. The roles of the cooperatives today include: (1) vertical integration, (2) improving bargaining power and economies of size in pooled marketing, and (3) improving access to credit, production inputs, and capital. Vertical integration (disintermediation) occurs when cooperatives take up one or more upstream or downstream activities, ruling out middlemen and potentially increasing returns to production. For example, many cooperative groups identify one woman to transport their products to a nearby village or larger trader where they can fetch a better price. Another example may be in cooperative groups moving into either the marketing of shea butter or even more value-added products such as shea soap or lotion.

Cooperative-level marketing increases bargaining power of individual producers (Cook, 1993). In general, individual rural women cannot access credit markets. Other production inputs and related capital such as donkeys, carts (used for harvesting the fruit and transporting the final transformed products to market), large plastic receptacles, or storage sheds (used for storing shea butter and nuts) are nearly impossible for many rural women to obtain individually. Cooperatives may be able to address these market failures by applying for credit and pooling individual resources as a group.

Part of what makes the cooperative so important in the marketing of shea is also a potential downfall. For example, the pooling of shea-based products is a source of

increased bargaining power for cooperative groups. This involves merging the products of several primary producers and marketing the combined (pooled) product.⁴⁴ Pooling is important for association-level storage and marketing efforts, especially those attempting to achieve the quantity requirements imposed by marketing agents or urban traders. Issues arise when pooling continues despite the failure of certain producers to meet the quality standards set by the organization. The end result is twofold. First, social dynamics (e.g., a feeling of solidarity amongst women) may deter cooperative managers from refusing products of unacceptable quality, resulting in free-rider behavior. Pooling of heterogeneous quality products leads to tainted batches of marketable products. In a worst-case scenario, the cooperative may receive a bad reputation, resulting in lost present and future sales. Pooling also thwarts efforts to improve upstream traceability in the value chain.⁴⁵

ii. Payment for Quality

Village-level traders are systematically unable to provide differential payment for quality due to the levels of information asymmetry in the Malian shea value chain. It is for this reason they often described as being “exploitative.” Their behavior is, however, simply a function of the information set available to them, and likely reflects future anticipated marketing costs (transportation and storage). This is a major problem because “when

44 This activity is also undertaken by village-level traders (who purchase from many individuals through small transactions), as they too gain economies of scale.

45 The author is unaware of specific actions taken by cooperatives to access information or technical services regarding improved processing methods to ensure high-quality products. It appears as though many NGOs and some governmental organizations attempt to reach the women with such information. The highly immobile nature of rural Malian women may make it difficult for even cooperative groups to seek out technical assistance. This is especially the case when seeking such information and services involves traveling over long distances.

markets do a bad job of distinguishing, certifying and rewarding variations in quality, markets will malfunction or even fail to exist” (Klitgaard, 1991).

Although primary producers generally do not receive payment for quality by village-level traders, there are several noteworthy exceptions to this rule. In the following examples, a quality-verification and preservation mechanism (or a successful alternative, such as an informal quality-assurance seal) has been developed to allow for payment for quality to primary producers. Through these examples it is clear that cooperative organization and the direct relationships between primary producers, traders and exporters (or entrepreneurs) play an important role in aligning the economic incentives facing primary producers.

Cooperatives

Evidence from Mali suggests that cooperative organization is a key element to ensuring efficient payment for quality to primary handlers. Payment schemes are largely based on organization’s member agreement and were constantly updated through “trial and error.”⁴⁶ For example, at least three unions or federated cooperatives (MPFEF in Dioila, COPROKAZAN, and COPROKASI) pay a buyer to verify and purchase three grades of shea nuts from members. In the case of COPROKAZAN, three nut grades were established: (1) boiled and sun-dried nuts, (2) boiled and roasted nuts and (3) buried and roasted, germinated, cracked, or broken nuts. Producers received payments of 100, 75 and 50 CFAF/kg, respectively. In the case of all three unions mentioned above, members were given the opportunity to be paid to transform and store the nuts in a central location using suggested “improved methods” from donors and technical

⁴⁶ The producer groups called such member agreements “mandates.” These are terms dictating participation requirements and remuneration and are agreed upon by members.

assistance organizations such as Prokarité. As mentioned previously, collective work acts as a *de facto* monitoring and quality-assurance mechanism, thereby reducing information asymmetry and incentives to cheat. These organizations test the chemical composition of their products in laboratories overseas and use the quality certificate as a signal to command a premium for quality from local high-income consumers, traders, downstream entrepreneurs, and exporters.

Traders, Entrepreneurs, and Exporters

Some larger traders, entrepreneurs and exporters have successfully developed their own quality-assurance seal by improving information flows between themselves and their shea sources. In several cases, shea handling training sessions (*formations*) attended by exporters, traders, and producer groups act as a “quality-assurance seal” in the absence of a uniform, accessible, and easily verifiable system of grades and standards. The notion of “repeated games,” via repeated encounters, helps to reduce much of the information asymmetry present, as producers know they may be precluded from selling to these entities in the future if they shirk. Downstream actors help to keep primary handlers up-to-date with follow-up training sessions, illustrations of improved handling methods, and informational handbooks published in local languages (Perakis, Fieldwork, 2006 and 2007).

C. Performance Outcomes: Production & Marketing Bottlenecks

Longstanding international interest in developing Mali’s shea subsector is a reflection of the country’s potential as a major shea butter and nut producing and exporting country and the important contribution revenues from the subsector could make to rural

women's income. Despite this interest and Mali's potential, several factors contribute to this country's decreased role and reputation in international shea marketing.

The retreat of Malian shea product exports is generally attributed to the relatively feeble and inconsistent quality and relatively high marketing costs (Derks, 2005). Together, these factors have incited high levels of perceived risk by foreign importers and traders (Derks & Lusby, 2006). Within the region, Malian primary producers consistently receive the lowest prices for their shea nuts and butter (Perakis, Fieldwork, 2006). Foreign oilseed firms prefer to import whole shea nuts (to maintain control over the oil extraction process), precluding primary producers from earning additional profits from their value-added commodities (the bulk of the marketing margins are gained after the primary products leave Mali).⁴⁷

One element of appraising market performance is "price coordination" (Brandow, 1977). An important aspect of price coordination is "appropriate price differences among varieties, grades or locations of products" (Brandow, 1977). High transaction costs and high levels of information asymmetry compromise traders' ability to pay appropriately for quality. Some producer groups attempted to adopt improved processing methods, but reverted back to their labor-saving production practices because they were not financially remunerated for their efforts. This indicator of poor performance in turn reinforces suboptimal conduct by players (there is little incentive for primary processors to produce high quality products if they are not receiving a price premium for their efforts), resulting in a "Market for Lemons." This dynamic also reflects the interdependent relationship and feedback between market structure, conduct, and performance suggested by Jesse (1978).

⁴⁷ For example, shea nuts may sell for 25 or 50 FCFA/kg (roughly 5-10 cents), whereas a kg of shea butter may sell for between 400 and 1000 FCFA.

Examples of the frequent quality related problems with artisanally processed shea butter (Perakis, Fieldwork, 2006) include:

- (1) Foreign material and objects in butter—often due to a lack of understanding by secondary processors of consumer needs, or a lack of sanitary storage receptacles.
- (2) Inconsistent color or texture—a result heterogeneous handling methods and pooling of shea butter and nuts at the village or cooperative level.
- (3) High levels of Polycyclic Aromatic Hydrocarbons (PAH)—known carcinogens.
- (4) Acute smell—caused by high free fatty acid levels from (1) unsanitary boiling, cleaning, and drying of shea nuts and (2) the labor-saving “bury-and-roast” shea nut drying method.
- (5) Degraded quality from inappropriate packaging and storage facilities (Derks, 2005)

Producers are also not specialized in the production and marketing of shea, but rather engage in alternative income-generating activities aside from shea (perhaps cotton, cereals, maize, or livestock during primary shea-processing periods) (McGlinchy, 2006; Perakis Fieldwork, 2006 and 2007). This diversification also reflects social roles in rural Mali, as women tend to familial plots (directly or indirectly) during the rainy season, but may also be a risk mitigation strategy. Most women’s groups are not engaged in preferred-supplier relationships with traders (or exporters) and lack insurance mechanisms in the case of either (1) a bad crop or (2) receiving very low prices for their goods.

Evidence suggests a reduction in the health of the Malian shea tree population. Contributing factors include the advanced age of many agroforestry parklands where the trees are mainly found, the trees’ slow maturation rate (which has discouraged planting and cultivation of shea trees), increased pressures placed on parklands due to urbanization, and shifts from communal to private land tenure arrangements (Toufik

Ftaïta, 2007; Perakis, Fieldwork, 2006 and 2007).⁴⁸ Nouvellet (2006) suggested that the cutting of branches and felling of shea trees are an important source of fuel wood for the country's villages and large towns, putting into question the strength and effectiveness of tree protection under the local tenure arrangements discussed earlier. This deterioration of production capital (trees, which are not owned, per se, but cared for under the rural informal land tenure systems) suggests a lack of incentives to maintain shea trees in rural Mali.

One of the rationales behind promoting the production and export of shea as a high-valued and value-added “non-timber forestry product” (NTFP) is that if the trees are valued for their NTFPs, efforts will be made by local populations to increase conservation of highly marginalized ecological zones by curtailing deforestation (CIFOR, 1998). However, placing too much value on such products may incite aggressive shea fruit harvesting, thereby exacerbating the exact problems such efforts originally attempted to reduce (Wollenburg and Engels, 1998).

Finally, the word *disorganized* is often used to describe dynamics in the Malian shea value chain. For example, shea products change hands many times before arriving in major cities—in part a result of market failures in complementary markets such as the rural credit market and transport sector. Many of the planned interventions within the subsector specifically aim to reduce the role of traders and middlemen (whose activities are viewed as excessive) in the marketing of shea, as they are thought to limit

48 This is consistent with other dynamics in this subsector. The agro-forestry parklands, where shea trees are found, must be maintained or monitored to ensure the health of the Malian shea tree population. If there is deterioration in the perceived value of shea nuts and butter, a decrease in the willingness of rural populations to care or maintain trees is understandable. This decreased interest in shea tree maintenance is highly problematic given the 20-year maturation period of shea trees. There is likewise anecdotal evidence that suggests a decrease in women's access to shea trees due to the partitioning or “allotissement” of land to private owners. .

returns to primary producers (each time the goods change hands they are marked up). It is important to note that although this behavior may be perceived as inefficient, and an excessive source of marketing margins, it may be necessary given current market realities (for example, the immobile nature of rural Malian women). This underscores the importance of understanding the roles of complementary markets (such as rural credit and transportation) and actors (in terms of both their actions and risk bearing) and identifying a channel captain who will play an organizing and coordinating role in the value chain.

VII. Analogies from Subsectors with Adverse Selection and Moral Hazard Forces at Play

As in many markets for high-valued and perishable commodities (Jaffee and Morton, 1995), the principal-agent dilemma is pervasive throughout the Malian shea subsector. As discussed in previous sections, incentives are misaligned between shea buyers and traders (the principal) and primary shea producers and producer groups (the agent). Traders and exporters desire shea products transformed using improved primary processing methods to sell to either (1) larger traders or (2) major oilseed companies. Such high-quality products may (1) improve the traders' reputation (ensuring future trading opportunities) or (2) command a premium on the international market (personal communication with exporters, Perakis Fieldwork, 2006 and 2007). Primary producers (and village-level producer groups and associations), on the other hand, are time-poor during the shea season. Information regarding production processes is asymmetric and non-verifiable, resulting in situations of both adverse selection and moral hazard (Macho and Pérez, 2001) in the buying and selling of shea.⁴⁹

Remedying Risk and Information Asymmetry: Potential Lessons to Learn

The “Market for Lemons” scenario is an applied case of the adverse selection problem. Pricing and coordination inefficiencies caused by information asymmetries and the resulting adverse selection are not unique to the Malian shea subsector. The analogies present stories of how adverse selection and moral hazard can be addressed to “modify or contain self-interested acts so that some balance is achieved in the

⁴⁹ Although both the forces of adverse selection and moral hazard are at play, the effects of adverse selection dominate in the context of exchanges conducted at village-level weekly markets.

cooperative and competitive motivations of the participating parties” (Jaffee and Morton, 1995).

The use of analogies in subsector studies is a type of comparative institutional analysis and involves making generalizations from “one sub-sector from an in-depth appraisal to another” (French, 1974) and was originally proposed by Hildreth, Krause, and Nelson (1973). The objective is to identify potential lessons that can be learned and applied to the case of Malian shea—with the hopes of realigning incentives to improve the overall quality (thereby improving this country’s reputation on the world market) so that the sale of this commodity for export as high-valued and value-added commodity can fulfill its promise as a powerful rural income-generation and poverty-alleviation tool. The following sections highlight how incentives were realigned in other subsectors, resulting in improved pricing and market performance outcomes: shea in Burkina Faso and Ghana, argan in Morocco, coffee in Cameroon, fresh fruit in California at the turn of the 20th century, and cotton in Mali. Each section closes with a discussion of specific lessons to learn and apply to case of shea in Mali.

These five disparate analogies point to a variety of mechanisms to improve market performance outcomes by reducing information asymmetries, aligning incentives between contracting parties, and improving quality in a variety of agricultural subsectors plagued by the forces of moral hazard and adverse selection. These mechanisms include: direct, preferred-supplier relationships between producer groups and downstream actors; first-handling of agricultural products by primary producers themselves (a form of vertical integration); the creation of a verifiable system of grades and standards bolstered by government and industry support; contingent pricing

arrangements between producer groups and downstream intermediaries; and reforming institutional arrangements (such as reduction of government marketing board involvement in grading, pricing, marketing, and remuneration practices) to help ensure that producers do indeed “feel” the effects of differential payment for quality. In addition, these case studies reinforce the importance of producer group (cooperatives, associations, and unions) organization and the nature of subsector development assistance (i.e., the type of aid) in projects which attempt to increase returns to primary producers while simultaneously improving quality at either the primary handling or value-adding stages of production.

A. Burkina Faso: The Role of Coordinated Government, Donor, and Private-Sector Efforts for Successful Subsector Promotion and Development

A spotlight currently shines on Burkina Faso, Mali’s eastern neighbor, where shea production and marketing is considered a West African success story. Over half of Burkinabé women are thought to participate in the production and marketing of shea (Gender and Trade, 2007). Although the estimated production potential in Burkina Faso is much lower than in Mali (150,000 MT of shelled shea nuts per year versus Mali’s 250,000 MT per year), it is the quality of Burkinabé products, achieved via widespread information dissemination and complementary price premiums, that make this case worth studying. Anecdotes from primary producer groups in the southern region of Mali (near Sikasso) and large traders and exporters confirm that Burkinabé traders systematically pay a higher price for shea than Malian traders, despite the lack of village-level quality testing mechanism (Perakis, Fieldwork, 2007; Personal

communication with Peace Corps volunteers, 2007).⁵⁰ Presumably, this is thanks to Burkina Faso's reputation within the subregion as a producer of high-quality shea products. The objective of this anecdote is to illustrate how concerted value chain support from government, donor, and the private-sector can facilitate the improvement of product quality, leading to a regional price advantage based on *reputation* and eventually the establishment of preferred-supplier relationships between larger primary producer groups and foreign oilseed and cosmetic firms.

Shea's important role in the Burkina Faso's export earnings sparked government interest long ago—shea was ranked second only to cotton in terms of export earnings in the 1970s and 1980s and third behind cotton and gold more recently (Elias, 2003; Harsch, 2001). Historically, shea prices and exports were regulated via the price stabilization and export promotion board, “the Caisse de Stabilization des Prix et des Produits Agricoles” (CSPPA). During the 1990s, several key subsectors in Burkina Faso (including shea) underwent structural adjustment in response to donor and international organization suggestions. The CSPPA was dismantled as part of the country's structural adjustment policies (SAPs). And, in 1994, the CFA franc was devalued by 50 percent (Elias, 2003).

During this period, the government continued to stress importance of the shea sector to the national economy and especially to rural women's livelihoods. In 1995 it made a public commitment to promote the status of women through the development of

⁵⁰ Malian wholesalers suspect that porous borders between these two countries compounded by the Burkinabé “price premium” has led to extensive amounts of Malian shea being marketed internationally as “Burkinabé shea” (Perakis, Fieldwork, 2007). This could be considered a negative performance outcome, as southern Malian producers may receive the Burkinabé premium, while the country as a whole suffers from declining declared export volumes and a declining regional reputation both detrimental to the potential of shea serving as a long term income generation and poverty alleviation tool.

the shea sector. In 1995 the *Projet National Karité* (PNK) was established under the *Ministère de la Promotion de la Femme* through the *Secrétariat Permanent des Engagements Nationaux*, a presidential task force to mitigate the challenges and take advantages of opportunities resulting from the devaluation of the CFA (Harsch, 2001; The Shea Network, 2007).⁵¹

As the country's economic situation worsened, donor and government efforts in the shea subsector began to mushroom under the guise of private-sector and gender-and-development focused efforts. Eventually, because of the proliferation of shea projects, the government decided to take on the role of channel captain by establishing a "coordinating committee to ensure that the different donor institutions did not operate at cross-purposes or duplicate efforts" (Harsch, 2001). This committee initially benefited from a high public profile, and continues to do so today. Ms. Gisèle Guigma, the former minister of women's advancement, played a vital role in attracting the United Nations Development Fund for Women (UNIFEM) to provide financial and technical assistance in the subsector.

UNIFEM's substantial contribution, complemented by extensive government oversight and support, was a turning point for over one hundred producer groups in Burkina Faso, as they received training in improved handling methods and oil extraction processes.⁵² Collaborative efforts between government, donors, industry, and the producer groups themselves were instrumental in establishing direct, preferred-supplier

51 In theory, with the devaluation of the CFA Franc in the 1990s, export products, like shea became less expensive to foreign consumers.

52 Discussions with international development organizations based in Mali suggest that this contribution was close to five million US dollars (Perakis, Fieldwork, 2007).

relationships between producer groups and the French cosmetics firm Occitane (UNDP, 2004).

Preferred-supplier relationships are long-term contractual arrangements between subsequent actors in the marketing chain. Examples of this include the relationships large retailers such as Carrefour (France) and Wal-Mart (USA) establish with “dedicated and specialized wholesalers” (Reardon, AEC 861, 2005). Although the emergence of this phenomenon is often thought of in the context of current retail-led transformation of global agrifood systems (Reardon, AEC 861, 2005), some cosmetic and oilseed processing firms have established similar relationships with shea butter producer groups in some West African countries. Firms engaged in such arrangements include Aarhus United and Occitane in Burkina Faso and the Body Shop in Ghana.

Such arrangements are designed to reduce search and transaction costs and ensure consistent and high-quality products. First, such long-term relationships help to assure market outlets for primary producers. Second, engaging marketing actors in repeated games helps to reduce incentives to cheat, or shirk on quality, thereby reducing information asymmetry. Moral hazard and adverse selection effects are reduced because those engaged in such relationships (buyers and suppliers) are aware that it is more beneficial to uphold the relationship than to renege on the agreement. Third, these arrangements increase returns to primary producers via the reduction of transaction costs, thereby permitting a reduction in the number of traders and middlemen.

More recently, Aarhus United partnered with the United Nations Development Program (UNDP) to install 400 multifunctional platforms (UNDP, 2004), with the

objective of directly linking producers with their target markets.⁵³ Producer groups learned improved production and handling methods and were linked up with a market that was willing to pay for quality based on reputation.⁵⁴ Evidence suggests that the positive welfare implications of such arrangements are most important for organized urban producers and processors (Elias, 2003), as they have restricted access to necessary capital and market information and have been able to produce the necessary “Quality@ Quantity” (Lovett, 2004).⁵⁵ This issue is discussed in more detail in the Argan analogy.

Overall, the positive effects of concerted donor, government, and private sector activities on the subsector include: (1) improved subsector organization, with government acting as a channel captain and targeted donor support; (2) the politicization of shea to ensure that it is continued to be viewed as an important resource for the national economy (for example, there is a designated Journée de la Karité (Shea Day) every year); (3) the establishment of direct producer relationships with foreign oilseed-processing companies; and (4) improving the quality and reputation of Burkinabé shea via widespread information dissemination on improved handling methods and linking farmers directly to markets to achieve the incentive effects and pricing efficiency. The direct effects of increased individual income and positive spillover effects resulting from increased incomes at the community level have resulted in

53 These help to reduce the labor requirement associated with the shea oil extraction process and to improve quality control.

54 The reputation being that Occitane was knowledgeable and involved with the training process, which served as an informal “quality-assurance” seal.

55 These groups are able to access important information and capital necessary for the successful international commercialization of shea and may not be engaged in the same time-competing activities as rural women (Elias et al., 2006).

improved livelihoods of many shea producers, their families, and surrounding communities.

B. Argan in Morocco: Putting into question who “wins” when high-valued agricultural commodities are promoted for foreign commercialization

This analogy tells the story of how the promotion of high-valued and value-added commodities historically dominated by the rural poor (such as shea) does not necessarily have positive welfare effects on primary rural producers (such as Malian women).⁵⁶ Although argan production has historically been dominated by the rural poor, urban entrepreneurs are primarily the actors to benefit from the global argan boom. It could be argued that this is primarily because the rural poor have not been able to address important quality issues due to lack of information and restricted access to capital—vital to the actual process of adding value. This has important implications for future efforts to develop the Malian shea subsector if measures of subsector performance outcomes include rural poverty alleviation.

The argan tree, *Argania spinosa* (L.) is a threatened species, endemic to southwest Morocco. The trees are found in an area of around 830,000 hectares of an arid area affected by intense human pressure (Pumareda et al., 2006). Argan oil has been used historically in Morocco for many of the same purposes as shea (culinary, cosmetic, and medicinal) (Lybbert et al., 2002; Larocca, 2007). The primary handling and processing of argan seeds into oil is conducted entirely by women while men historically market the products.

Argan has attracted increased international interest for three primary reasons. First is the role of Argan trees in slowing the process of desertification in southern

⁵⁶ The author would like to thank Professor Tom Reardon for referring her to this story.

Morocco (Charrouf, 2002 and Lybbert et al., 2002). Second, given the importance of argan oil to local economies, it has been targeted as an income-generating tool as a non-traditional and value-added non-timber forestry product. Third, argan oil (extracted from the trees' nuts) is one of the latest "miracle" ingredients in the Western beauty industry (Larocca, 2007) thanks to its restorative and age-defying effects. International development agencies and the Moroccan government have promoted the use of market-based incentives for the rural poor to protect and conserve the argan trees to help combat the forces of desertification. The rationale for this is essentially that the increasing value of argan oil will lead to an increase in the value placed on trees. This, in theory, should lead to a reduction in the felling of argan trees, thereby (1) decreasing the effects of desertification and (2) potentially improving the economic wellbeing of argan oil producers.

Argan and shea exhibit other similar characteristics including the importance of both argan to the rural economy and primary handling practices on argan oil quality. Estimates suggest that prior to the discovery of this "liquid gold" (Larocca, 2007) by the West, three million people in argan-producing areas derived up to 90 percent of their income from the marketing of argan oil (Charrouf, 2002; Lybbert et al., 2002). Historically, only a small fraction of total oil production was marketed, with the majority consumed at the household level. Primary handling (depulping) and processing methods play a major role in argan oil quality (Lybbert et al., 2002). Most argan has historically been marketed via spot markets, where quality is not verifiable and prices are uniform—mirroring the "Market for Lemons" scenario present in the shea subsector.

Some argan is marketed via social networks, where reputation in repeated encounters helps marketing agents to command a price premium.

As in the shea subsector, foreign consumers value high-quality (mechanically extracted, pure, undiluted) argan. Only a handful of entrepreneurs (wealthy urban entrants) in Morocco are able to meet such demands and receive a premium for quality. To date, traditional argan oil producers continue to access only the lowest price because they cannot access the “capital investments necessary to improve argan oil quality and reap associated market premia” (Lybbert et al., 2002) and face high “mobility barriers” (Fafchamps, 1994; Barrett, 1997).

The difference between argan and shea is that there exist national-level quality standards for argan oil. And, although argan was originally identified by UNESCO and the Moroccan government as an important natural resource to be conserved (via market-based incentives) by the rural poor, those actually benefiting from the argan “boom” are not the rural poor, but rather new entrants into the subsector with the capital to (1) mechanically extract the oil in a manner that conforms with international standards and (2) test that their oil is in accordance with such standards.

Women’s cooperatives occasionally capitalize on this emerging high-valued market by collectively raising funds to make necessary investments. Again, this mirrors a phenomenon observed in Mali where some of the larger cooperatives have acquired a mill or a multifunctional platform to help them deal with some of the issues related to village-level processing.

The point to take from the argan story is that just because the “newly discovered” high-valued product for export is originally produced, consumed, and marketed by the

rural poor, they may not benefit from extensive international commercialization. This is especially the case when (1) the product is already produced and consumed extensively locally, resulting in competing marketing channels (as producers are also consumers of the good and affected in various ways by increased prices) or (2) when quality is a major determinant of potential returns to producers, but can only be achieved through major capital investments. In the latter situation, quality and capital requirements can act as barriers to entry, thereby precluding small rural producers from penetrating international markets. In Morocco, rural transfer costs are so high that the rural poor in high forest density regions do not financially benefit from international argan oil commercialization in a way that could induce rural argan tree conservation (Lybbert et al., 2002). In low forest density areas, the response to increases in argan fruit prices (those paid by traders and processors) is increasingly aggressive argan fruit picking practices (Lybbert et al., 2002). Aggressive fruit picking may have two effects: first, using sticks or clubs to hit hard-to-reach fruit may cause damage to the trees, and second, excessive harvesting may not leave enough seeds for the trees to reproduce naturally. Together, these results thwart market-based conservation efforts for argan trees.

This analogy highlights that the type of assistance and international intervention matters in ensuring that targeted populations (such as poor rural women) benefit from the international commercialization of indigenous products. Producer organization, access to capital, access to markets, infrastructure, market information, and quality-verification methods all play into how well a processor (individual entrepreneur or cooperative) is able to directly supply to the international market and circumvent the

forces of moral hazard and adverse selection present at village-level markets. This analogy likewise underscores the role of the divergent incentives felt by poor rural producers, rural cooperatives, and individual entrepreneurs to improve quality. Evidence from this case suggests under the Argan subsector's current structure, private incentives felt by individual entrepreneurs to invest in quality are strongest and economic incentives are not communicated to responsible parties to protect and conserve Argan trees. Current market-based incentives have thwarted conservation and poverty alleviation efforts. In the future, it may be possible to organize producer groups involved in primary handling and value-added activities such that necessary economic incentives are communicated through the value chain to induce investment in quality and tree conservation.

C. Coffee in Cameroon: Institutional change and village-level quality improvement

The objective of this analogy is to use the case of the Cameroonian Arabica coffee subsector to describe the role of institutional reform in reducing the effects of moral hazard and adverse selection, resulting in increased payment to primary handlers and improved product. Economic crises in Cameroon in the late 1980s led the World Bank (WB) to suggest economic reform via a series of structural adjustment programs (SAPs). An important component of the SAPs was the privatization of the Arabica coffee market, including national and cooperative-level policy-reform components. This section first describes some of the key structural characteristics of the Cameroonian Arabica coffee subsector and how these affect subsector conduct and performance; second is a discussion of key institutional arrangements during the pre-reform period and; third is a discussion of how improved Arabica coffee quality and pricing efficiency were achieved

during the post-reform period. This section concludes with a discussion of specific lessons that can be learned and applied to the Malian shea case.

Coffee is truly a “for export” commodity in Cameroon in that it is rarely consumed domestically, with 95 percent of production destined for the international market. The Cameroonian Arabica coffee subsector is therefore composed of a single marketing channel. Coffee quality is largely dependent upon the practices undertaken by individual primary handlers, while quality is only measured with accuracy at (or towards) the end of the marketing chain—via taste-testing (cupping), undertaken in high-income coffee importing countries. In the coffee subsector, primary handling includes the harvesting and washing of coffee beans, which must begin within 24 to 36 hours of harvest.⁵⁷ Unlike in many coffee-producing countries, coffee washing in Cameroon is performed by a large number of small and dispersed producers as an on-farm activity. These producers have been characterized as having high opportunity costs and important incentives to shirk (Wessen, 1998). Arabica coffee beans exhibit high levels of quality variation based on heterogeneous primary handling methods, including coffee bean washing, pulping, parchment fermentation, and drying—each of which influences the quality of the final product. Local heterogeneity is compounded as economies of scale exist in coffee transportation, shipping (domestic and international), processing, and marketing—leading to progressive *pooling* at various stages of the marketing chain.

During the pre-SAP period, the National Produce Marketing Board (NPMB) held the sole right to export Arabica coffee, retain the residual earnings from sales, and disburse earnings *ad libitum*. The NPMB administratively determined producer prices

⁵⁷ The initial processing of coffee beans post-harvest is referred to as *washing*—including pulping the beans, carefully monitored fermentation and rinsing of the parchment (outer skin), and, finally, coffee bean drying (Wessen, 1998).

and marketing margins for Arabica coffee and used pan-territorial pricing schemes, which contained minimal quality distinctions (washed versus unwashed and good versus bad quality beans). The NPMB also determined “residual bonus payments” to producers, which essentially institutionalized second payments to farmers in a way that had little if anything to do with performance (Wessen, 1998). Finally, the marketing board had exclusive control over the activities of coffee cooperatives—which linked primary producers and downstream marketing actors. Although unions were responsible for secondary processing (including milling, grading, and sorting), NPMB policies were such that the unions had little incentive to consistently sort or grade Arabica coffee destined for the export market. As a result, Cameroonian Arabica coffee quality deteriorated significantly under this regime, as did the prices paid by buyers, which were routinely discounted because of poor and inconsistent quality and unreliable shipments (World Bank, 1989 and USAID, 1990).

The pre-SAP Cameroonian Arabica coffee subsector was characterized as exhibiting high levels of information asymmetry and few incentives for primary producers and intermediary actors to invest time into the production of high-quality beans—resulting in the forces of moral hazard and adverse selection. First, progressive pooling makes it difficult for market feedback mechanisms (prices) to be felt by individual producer. Rather, the “group” was rewarded (or discounted) for quality based on a measurement of average quality of the entire lot. Second, Arabica coffee production involves a large number of processing stages and intermediaries, and long distances between primary producers and final consumers, and it is difficult to determine quality at the producer level. Together, these resulted in weak market

feedback mechanisms (felt via prices) for the rural poor engaged in Arabica coffee production and marketing—those who are best poised to ensure quality and to potentially benefit on a wide scale from increased pricing efficiency.

Economic crisis in Cameroon in the late 1980s led the WB and others to suggest a series of SAPs. One of the main components was an agreement to liberalize the Arabica coffee market—a process that included national and cooperative-level policy reforms. While some reforms were achieved, much can be learned from the reforms that *were not* made. For example, “early during implementation, reform planners realized that it was only feasible to track coffee from unions to the market” (Wessen, 1998). A more extensive system of traceability could lead to losses in economies of scale in subsequent processing. This means that for individual producers to feel the benefits of improved quality the quality of the entire union-level pool would need to be improved. Primary producers were never established as residual claimants, and as such never fully felt the intended economic incentives of the reform process. This is despite introduced improved farm level quality-control measures (based on crude quality measures).

Newly established marketing actors such as the North West Cooperative Association Ltd. (NWCA) only distinguished between “good” and “poor” quality coffee and never between mediocre and good, or good and best (Wessen, 1998). Producers were rewarded for average quality coffee. Another quality and pricing category reflecting economically important attributes could have reduced the production of “average” quality coffee and increased incentives to produce “high” quality Arabica coffee.

Despite all the problems, primary producers' share of the export price increased to 70 percent (up from 50 percent during the 1980s) following market liberalization. Reduced prices for unwashed Arabica led to a decrease in the share of unwashed Arabica in total production. Producers responded to improved incentives by significantly expanding production as well. The market reforms also reduced the flow of Arabica coffee across provincial borders, where it could be classified as a different commodity and remunerated as such (producers were now remunerated for quality within their province and did not need to travel across provincial or national borders in order to receive differential payment for quality) (Wessen, 1998). Improved vertical coordination of cooperative marketing activities led to improved monitoring, resulting in a positive impact on quality.

Several lessons can be drawn from this analogy. Most importantly, it highlights the potential importance of institutional change in improving producer incentives and product quality. Under the pre-SAP regime, individual producers and producer cooperatives were not rewarded for quality, as this happened further down the marketing chain (at the Union level, where the quality levels were decided, but not determined). The phenomenon in turn created space for adverse selection and moral hazard effects, as the subsector's structure is such that high levels of information asymmetry at the "quality-determining" stages of production exist. The final result was that Cameroonian Arabica coffee was systematically discounted on the international market and the coffee even leaked over porous international borders to places where it could be re-labeled and command a slight premium thanks to the reputation of Cameroon's neighbors (a sub-optimal performance outcome).

The removal of government from various marketing responsibilities allowed some incentives to trickle down to producers themselves, essential to improving Arabica coffee quality. This is not to say the government's role in subsector's development is unimportant. Government can play a supporting role by (1) promoting the subsector as being of strategic importance to the national economy or to achieving important national objectives, such as increasing women's incomes, (2) supporting a system of grades and standards, (3) attracting FDI or donor assistance, (4) conducting research or providing agricultural extension services, and (5) coordinating subsector development assistance.

In addition, this analogy has highlighted the importance of vertical coordination in distinguishing, certifying, and rewarding for quality in the presence of various market failures. This is important as organizations such as the UEOMA begin to implement their regional grades and standards. This case also presents the importance of establishing not just "good" and "bad" qualities, but a sufficient number of grades to reflect the differences in quality valued by consumer. Finally, this case study has put a spotlight on the potential failures of pan-territorial pricing as production and marketing costs (such as transfer costs) vary widely across producers.

D. California Fresh Fruit: Contingent pricing for transactions involving high levels of producer and buyer risk and uncertainty

The objective of this analogy is to present how contingent pricing (or two-part pricing) has been used in the California fresh-fruit subsector to address the issues of moral hazard and adverse selection. Contingent pricing can lead to decreased producer price risk and improved quality in culturally dependent characteristics.⁵⁸ First is a description of the subsector's structure. Second, is a discussion of information

⁵⁸ Please see Table 1 and Table 2 for examples of cultural versus environmental factors that affect product quality.

asymmetry issues present and their role as sources of risk in this subsector. Third is a discussion of how contingent-pricing has been used at the cooperative level to help reduce price risk. Fourth is a presentation of potential lessons to learn from this analogy.

Fresh fruits are high-valued, perishable, and often transported over long distances to reach final consumers. Fresh-fruit quality can be difficult to measure and can easily change between the point of sale and the final consumer. Quality also depends on both cultural and biological factors. Together these characteristics can lead to high levels of information asymmetry and risk felt by primary fresh-fruit producers and marketing agents.

In the United States, California emerged as an important source of fresh produce in the early 20th century, with important market outlets in the local canning industry, the East Coast (USA), and the international market (Garoyan, 1976). This structure led to high levels of risk for various actors in the marketing chain. First, rapid perishability can lead to high levels of risk in long-distance and international trade, as suppliers are vulnerable to customs and inspection delays, or false quality claims leading to inefficient pricing schemes (Jaffee and Morton, 1995). Second, the monopsonistic nature of the local fresh fruit processing sector made producers vulnerable to the detrimental effects of “hold-up” situations.⁵⁹ These and other downstream coordination problems eventually led primary fresh fruit producers to organize themselves into producer cooperatives.

Fresh fruits and vegetables are *pooled* at either the *cooperative* level or *first handler level* (Statz, 1987). This serves two primary purposes. First, this is one way to

⁵⁹ Production of most tree fruit crops is geographically dispersed, resulting in spatial isolation. This often restricts a grower to nearby processors or handlers (Garoyan, 1976) who can extract quasi-rents from vulnerable producers late in the growing season.

handle some of risk caused by potentially volatile production levels and prices. Second, there are economies of scale via either private or collective action in post-harvest handling, processing, and in certain quality control and transport operations through coordination of marketing activities (Jaffee and Morton, 1995). As a result of pooling, producers lose incentives to produce anything other than the minimum acceptable level to be in the pool, often leading to the degradation of the pool's overall quality. The resulting scenario often leads to buyers paying either the price of the *average* quality or, in a worst case scenario, the price of the lowest quality—Akerlof's "Market for Lemons."

Although quality is important for all fresh fruit market outlets, determining, measuring, and ensuring quality can create obstacles for producers and marketing actors. For example, fresh-fruit quality is determined by biological (i.e., the variety of tree, quality of soil, rainfall) and cultural practices (referring to how the products are handled and processed during the harvesting and post-harvest process). While the cultural determinants of quality described above are certainly under the control of producers, biological determinants are not necessarily. As a result, producers are reluctant to receive payment strictly as a function of quality, as it is not entirely under the producer's control. Typically, the producer has to receive an additional premium to make it worth the risk. At this point, the question is whether at this new price the final product can still be competitive in the market (Statz, Personal Communication, 2007). In addition, it can be difficult to measure and assess quality (Hueth, 1999), as some attributes may be hidden or difficult to measure (Jaffee and Morton, 1995), leading to moral hazard problems on the part of primary producers (Hueth, 1999). This also implies that reputation is central to the fresh marketing and trade, as it "serves as close

proxy for (expected) quality and overall reliability” (Jaffee and Morton, 1995). Inefficient pricing outcomes resulted from these various sources of uncertainty and risk, much like the Malian shea subsector.

One of the first mechanisms through which producers decided to solve some of these risk-related problems was via cooperative organization. This was first and foremost designed to address problems related to (1) input availability and (2) downstream marketing practices. For example, the California Fruit Growers Exchange (later Sunkist) vertically integrated backward and forward to gain greater control over the input and distribution systems for their products (Olmstead and Rhode, 1997; Staatz, 1987). A second mechanism was the establishment of cooperative-level contingent pricing mechanisms.

During the early 20th century, parallel to cooperative organization and vertical integration, fresh-fruit producers agreed to contingent pricing arrangements to help resolve pricing inefficiencies (Olmstead and Rhodes, 1997). Contingent pricing contracts at the cooperative level have several advantages in an uncertain environment (Staatz, 1987). According to Wessen (1998) “contingent pricing, or two-payment, arrangements are the most common solution to this pricing dilemma. During the initial market transaction, a pricing formula or convention is used to make a partial payment to farmers. A second payment, or bonus, is paid after quality is measured and sales prices are determined. The second payment communicates any quality premium (or discount) back to the individual producer, and thus rewards him for quality.” The important result is that primary producers and handlers were rewarded for investing their time and energy into the quality attributes which they had *control over* even though many of these

are expressed at a later time downstream in the marketing chain. Together, cooperative organization and contingent pricing arrangements helped to address residual claimancy issues on the part of producers in that they were made directly responsible (in terms of how they are compensated by downstream marketing agents) for the poor (or good) expression of important quality attributes (Hueth et al., 1999).

Contingent pricing arrangements in the Malian shea subsector will require high levels of transparency and trust in the system developed to make payments to producers. Although incentives to shirk abound, the cooperative is likely the best positioned to administer contingent pricing schemes. High levels of information asymmetry and a lack of trust make it impossible to develop contingent pricing contracts between individual primary producers and village-level traders. This is in part because individual producers engaging with traders may be suspicious about whether the final reported price was indeed the price received (Statz, Personal Communication, 2007). These same producers may likewise be suspicious about quality deterioration due to mishandling between the village and the final market. Producers may accept contingent pricing at the cooperative level than via individual spot-market transactions, as the cooperative is more likely to be vigilant of protecting members' interests.⁶⁰

First, contingent payment could be made part of the cooperative organization and agreement (mandate). Second, producer and downstream market actor organization coordination needs to address free-rider issues present in the pooling process. For example, pooling "good" and "bad" quality products inhibits payment for quality (for the cooperative's pooled nuts or butter) downstream, which in turn reduces the premium for

⁶⁰ This would require honesty and competency on the part of cooperative managers in addition to those involved in payment monitoring and distribution.

quality to be paid to primary producers as part of the second stage of the two-stage contingent pricing arrangement. Producer organizations such as the cooperative may be best positioned help to encourage peer monitoring to help reduce incentives to cheat throughout the pooling process.

E. Cotton, Mali: First Handling by Primary Producers

The objective of this analogy is to present how first-handling by primary cotton producer associations has helped to overcome some of the distrust between producers and graders in the Malian cotton subsector. This distrust is rooted in high levels of information asymmetry on the parts of both producers and graders, resulting in moral hazard and adverse selection. First is a description of some of the important structural characteristics of the Malian cotton subsector. Second is a presentation of the types of information asymmetry present and resulting effects. Third is a description of how the negative effects of information asymmetry have been addressed and how pricing efficiency, quality, and returns to producers can improve.

Mali is one of West Africa's most important cotton producers, second only to Burkina Faso (Esteulle et al., 2007). Ninety-eight percent of Malian cotton is exported by the dually monopsonistic and monopolistic "Compagnie Malienne pour le Développement des Fibres Textiles" (CMDT), resulting in no competing production or marketing channels. Cotton is Mali's second most important export after gold, contributing to eight percent of gross domestic product (Behrendt, 2006; Tefft, 2003; Tefft, 2004). It is therefore of strategic importance to the national economy.

Cotton is generally produced by small-scale producers (two to three hectares) (Behrendt, 2006), undergoes primary grading and sorting at the village association

level, and is marketed to a monopsonistic buyer, the CMDT, under a fixed, pan-territorial pricing scheme established at the beginning of the cotton season (Tefft, 2003; Tefft, 2004). Producing cotton under smallholder conditions mentioned above often requires a trade-off between quality and quantity (May, 2003), as pricing incentives present are such that producers would often prefer to sell large quantities of mediocre-quality cotton in lieu of small quantities of high-quality cotton. Cotton is pooled at various stages of the marketing chain (association level, via the transportation process, and at the ginning facility), leading to reduced individual incentives to invest in quality.

The quality of cotton is determined by its spinning quality and is measured by four sets of fiber characteristics: fiber length and length uniformity; strength; fineness and maturity; and percentage of broken fibers (Bingen, 2006). These quality characteristics may be compromised by a combination of biological and cultural factors (Bingen, 2006). Quality standards are established by the CMDT at least once a year at the beginning of the cotton production season (Bingen, 2006). Many village-level associations use sample boxes of cotton distributed by the CMDT (which uses the USDA's grades) in an effort improve visual association-level grading.

A major issue in this subsector is the *lack of trust* between primary producer groups and those involved in the formal grading process, which takes place downstream in the marketing chain at the point of ginning (Bingen et al., 1995; Tefft, 2003; Tefft, 2004). This has resulted in moral hazard and adverse selection effects in the production and marketing of various qualities of cotton. For example, at the time of transaction, producers know their investment toward the production a certain quality of cotton (adverse selection). After an agreement or contract has been established,

producers, traders and ginners control various cultural factors playing into cotton quality (moral hazard). The resulting scenario, compounded by the negative effects of pooling, is one in which overall quality and price is driven down.

In 1974, the CMDT established Associations Villageoises (AV)—village-based farmer organizations—to address farmer complaints of “dishonest cotton grading and weighing practices” (Bingen et al., 1995; Tefft, 2003; Tefft, 2004). This eventually led to the processes of seed cotton assembly, weighing, grading, and ginning receiving oversight and participation from local cotton farmer organizations (Bingen, 1998). At that time, the CMDT understood the importance of farmer incentives on the successful development of Mali’s cotton subsector. These incentives included, but were not limited to, access to credit to purchase inputs and equipment, a guaranteed market to sell their seed cotton at fixed prices (Tefft, 2003), and differential payment for quality. Vertical structure and involvement by the CMDT in the subsector has resulted in very few (if any) intermediaries between primary producers and the CMDT. This “vertically integrated support” (Tefft, 2004) to the cotton subsector in the form of production inputs, credit, research, extension support has allowed the CMDT to monitor and influence cotton production carefully, despite the somewhat atomistic nature of primary producers.

Several important lessons can be learned from this analogy. The first handling of cotton by village-level producer groups in Mali has attempted to achieve two goals: first, it is a form of vertical integration (from the bottom up) which theoretically may lead to a reduction in transaction costs and, second, it addresses the historical asymmetrical

information issues present during the cotton grading and sorting processes.⁶¹ With vertical integration and coordination and the subsequent reduction of some transaction costs, we may observe a greater percentage share of the final retail price going to primary producers. The extent depends on the additional costs associated with new subsector activities with which primary producers may be altogether unfamiliar. Primary producers' engagement in grading and other activities helped to improve their understanding of quality issues present and their trust in marketing chain actors—with the potential to reduce moral hazard and adverse selection effects.

While first handling arrangements may improve quality and returns to primary producers, this case revealed several complementary factors that must first be addressed before shea producers can become “first” or “primary” handlers in the sense described above including: (1) the organization of producers into village-level producer groups or associations, (2) a distinct and reasonably verifiable set of quality characteristics for producers, traders and buyers alike to look for, (3) improved information flows between international oilseed and cosmetics companies and primary producers and handlers, and (4) an agreement by marketing chain actors. If any of these is missing, the potential to reduce information asymmetries and cheating falls significantly.

First, producers should be organized at the village level (beyond the informal women's associations) to designate what is produced and where goods are stored, in addition to who learns and implements grading and sorting methods proposed by Prokarité. Evidence suggests that women's associations and cooperatives play an

⁶¹ Vertical integration is defined as “the coordination or performance of two or more sequential stages or functions of the marketing channel within a single organization” (Jacobs, 1995).

important, if not vital, role in the production of large quantities of high quality shea nuts (collection, drying, and primary pooling). This is primarily because of the tendency of individuals to shirk (i.e., make time-saving shortcuts) in the absence of monitoring mechanisms, leading to the “Market for Lemons” scenario. With group, or collective, action this scenario might be avoided via the peer pressure and monitoring mechanisms, much like those used in group micro-credit lending (the Grameen Bank model, as an example).

The author sees no reason why subsequent pooling and processing into butter is any better suited to cooperatives than to private firms. In fact, private investors and entrepreneurs might be better positioned to purchase mechanized milling equipment and dried nuts for extraction (Elias et al., 2006).⁶² These actors might have better access to credit, imported capital for shea oil extraction, and information about market outlets and improved processing methods. Through their individual investments, entrepreneurs might have better incentives to maintain their equipment and stay up to date on the latest technologies and trends outside of the realm of NGO and donor support (Hyman, 1991). As long as they are remunerated by downstream marketing actors, private entrepreneurs would also have an incentive to pay for quality for their inputs of production (the shea nuts).

Second, information regarding grading and sorting specifications should be disseminated at the beginning and throughout the shea season. This helps to reinforce previously learned information and methods, and update producers about prices and other market information. Another advantage of the organization of shea nut handlers is

⁶² Please see the Argan analogy for further discussion of this.

that information may be more readily accessible and more easily disseminated at the association level than to individuals. This is especially the case in rural settings, where such information is often disseminated via (1) radios (which may not be accessible to women) or (2) village-level markets (where women are truly price takers).

Third, cotton grading is possible at the association level thanks to a clear set of grades and standards that are set by the CMDT at the end of each production season for the next growing year. This has resulted in improved information flow between the buyers and the primary producer associations. Although the regional project “ProKarité” has attempted to set up a similar set of uniform grades and standards for shea in West Africa (see section V), to date, individual companies are responsible for setting their own standards for shea, often only be verified by laboratory analysis.

As discussed previously, many actors in the marketing chain should be consulted and implicated for this system of grades and standards to be credible and achieve its goals. As of August, 2007, the major Malian shea cooperatives and exporters were in the process of establishing parallel producer and exporter networks, with a universal goal of establishing an avenue through which to apply pressure on government to pay closer attention to shea. A network-based approach to addressing questions of grades, standards, quality, pricing, and certification will likely be most effective in the Malian shea case to help balance domestic interests against the strong and centralized international ones. Relying on the pre-established organizational strength of the networks may also help to facilitate the flow of information between actors.

Fourth, one issue plaguing the shea subsector in Mali is a lack of trust between various actors in the marketing chain (namely between primary producers and village-

level traders). This is largely due to high information costs associated with the grading and sorting of shea at the village level. Establishing shea producer organizations as first handlers requires the blessings of downstream marketing actors, including traders and exporters. While the objectives of the previously mentioned shea producer and exporter networks are not perfectly congruent, they may be able to work together to achieve mutually beneficial outcomes (i.e., increase quality shea sold, improve the reputation of Malian shea on the world market, and augment the price paid by international buyers). This may be most easily achieved by establishing deeper and more widespread direct links between larger cooperative groups and exporters to address some of the uncertainty present in the market.

VIII. Past Interventions and Future Areas of Government, Donor, NGO and University-based Support: Prescriptions and Policy Recommendations and suggested areas of future investigation

Government, donors, and non-governmental organizations have used the subsector studies approach to efficiently identify ways to improve market performance and develop agricultural subsector assistance strategies. The analogies above demonstrate that the *location* of information asymmetry in a subsector as well as the *type* of assistance provided play an important role in intervention outcomes—including improved product quality and how the poor benefit from the commercialization of their products to high-income foreign consumers.⁶³ As such, the identification of key leverage points within the value-chain is of high priority in that it (along with other results from the subsector analysis and analogies) helps to motivate both policy recommendations and future areas of investigation. The following discussion follows that logic: first is a presentation of both past and current interventions by government and donors, second is a presentation of the key leverage points identified through the subsector analysis, third are policy recommendations to government followed by recommendations to donors and NGOs, and finally is a brief presentation of potential extensions and future areas of investigation.

Past Interventions in the Malian Shea Subsector

Four factors motivate interest in promoting the Malian shea value chain: Mali's important shea tree population, the growing niche-market demand in industrialized nations for shea butter, the large number of female participants in the subsector, and the relative importance of cash income from shea to many female participants. Interventions have

⁶³ This refers to both the figurative location in the value chain and the physical or geographic location.

largely been under the guise of non-traditional agricultural export diversification efforts. These efforts have largely been project-based—designed to help producers in specific villages or zones (identified as having particularly high production potential) or in highly visible urban centers. This is the despite the presence of primary shea producers throughout the country.

Interventions designed to improve shea quality and returns to primary producers have largely done so at either the primary producer or exporter level. These have generally focused on improved production technologies (including improved handling and processing techniques and labor-saving technologies), producer group organization and technical assistance to producer associations in the areas of marketing and contracting (including quality and packaging requirements), linking farmers to markets, exporter assistance, and environmental preservation and sustainability through agro-forestry parkland preservation at the primary producer level. Aside from a few success stories (mentioned in previous sections), these past interventions have largely failed to provide the necessary incentives at the primary producer level to motivate rural women to produce shea with the quality characteristics desired by international buyers and required to improve the reputation of shea “made in Mali.”

Improved Production Technologies: Labor-Saving Capital and Handling Methods

Traditional shea oil extraction methods are labor-intensive. In an effort to help lighten women’s workload, new labor-saving technologies including diesel-powered mills, oil-extractors, and various shea nut dryers have been developed and introduced. Such projects were especially popular in the early 1980s (Hyman, 1991), but adoption rates were low. This was largely due to the difficulty of maintaining prototype machines in a setting

where spare parts were limited and where incentives for machinery upkeep were low (Hyman, 1991).

More recently, multifunctional platforms have been the centerpiece of many efforts to reduce women's time constraints and physical work burden. As their name suggests, these were designed as part of a more comprehensive effort to reduce women's labor burden (opportunity cost) and increase rural women's income (some MFPs are used to produce electricity; others are used to mill grains). The UNDP (in concert with the Malian government) and the African Development Foundation have supported MFP installation efforts. The author's observations suggest that prerequisites for receiving such assistance include high levels of producer organization, storage capacity, and shea nut quality (such as the Siby-based COPROKASI and the Zantiebougou-based CORPOKAZAN).

Solar shea nut dryers have also been developed as labor-saving technologies. These include a solar-panel-powered dryer from the Institute d'Economie Rural (IER) and a ventilated, plastic-covered dryer developed by ProKarité (a regional project funded by the UN's Common Fund for Commodities). Neither has been adopted due to (1) the capital requirements to install and maintain them; (2) their low capacity and, (3) although the solar dryers were created to help reduce shea nut drying time, users found that they actually *lengthen* the drying time (Perakis, Fieldwork, 2006 and 2007; Hyman, 1991).⁶⁴ Some larger cooperatives are experimenting with table dryers that are very similar to the tables used in Ghana to dry cocoa. The frame is made of wood and local materials and the tabletop is made of natural water-permeable fibers to allow rainwater

⁶⁴ For example, in Figure 5, the solar powered dryer was originally designed by IER to dry horticultural products such as tomatoes, onions and shallots. The cooperative in Lafiala found that it actually increased average drying time (Perakis, Fieldwork, 2007).

to filter through without causing damage to the drying shea nuts (ULPK, Personal Communication, 2006).



Figure 5 IER Solar powered shea nut dryer, Lafiala, Mali (Perakis, Fieldwork, 2007)



Figure 6 Prokarité Shea nut dryer, Zantiebougou, Mali (Perakis, Fieldwork, 2007)

There have been many efforts to promote the “boil and sundry” drying and improved processing methods. Producer groups in the areas surrounding Sikasso told stories of NGOs and donors providing technical training to improve shea product drying, processing, and storage, but not providing market outlets with a price premium for their value-added products (Perakis, Fieldwork, 2007). After adopting the improved handling methods the first year, they quickly disadopted them—underscoring the importance of both disseminating improved technologies and ensuring market outlet in which producers can command a price-premium.

In 2007 and 2008, Prokarité, the West African Trade Hub (WATH), and USAID Mali collectively organized training sessions for producer groups recruited via American Peace Corps volunteers. Primary producers, traders, exporters, and donors alike were present and received identical training. These training sessions serve three particularly important purposes: (1) they make use of the highly mobile Peace Corps volunteers to play a linking role between primary producer and the international market; (2) they put producers and exporters face to face with one another, while historically they would be separated by a host of middlemen; and (3) they serve as an informal quality-assurance seal, helping to reduce some of the information asymmetry between producers and buyers (Perakis Fieldwork, 2007). Although the actual results from these encounters are mixed, it is a potential organizational approach to help overcome the “Market for Lemons” situation.

Producer Organization

Given the importance of group work and pooling in shea production and marketing, several organizations provide assistance in the area of producer organizations and cooperative management. For example, in the late 1990s, OMAFES was responsible for organizing producer groups in the Koulikoro region. This effort targeted specific value chains aimed at augmenting agricultural diversification such as shea, sesame, and garden vegetable production. During this same period, the NGO Association Conseil pour le Développement (ACOD) provided similar assistance to the large Siby-based COPROKAZAN. The Dutch NGO SNV provided similar assistance to the producer Union ULPK, in Dioila, until 2007. In the latter case, efforts were well intentioned, but the incentives created through the cooperative mandate were counter-productive (above-market prices were paid for shea butter, regardless of quality; there was a lack of union-level quality control, and

pooling of products within and between member cooperatives), reflecting the importance of strong producer organization goals and objectives and the potential distorting effects of artificial donor incentives.

Technical Assistance to Wholesalers and Exporters

Mali's reputation as a producer of low quality shea nuts and butter led international donors to provide train wholesalers and exporters in the area of improved shea handling and marketing, with the assumption that both this knowledge and incentives would trickle down to primary producers. Until 2005, USAID primarily targeted the large Bamako-based exporters with various types of exporter assistance programs, including training in the areas of quality and packaging requirements for export and contracting. These actors are more visible than village-level producers in that they have fixed addresses, websites, cell-phone numbers, and, most importantly, access to important information. There is no doubt these actors have an incentive to procure the best quality products from their buyers, but in some ways they are caught between a rock in a hard place— they automatically receive a price discount for shea “made in Mali” and they rely on a network of traders who also have an incentive to behave opportunistically, thereby compromising the ability of benefits from such assistance to trickle down to the producer level.

Since 2004, the Malian government's Ministry of Women's Affairs (Ministère de la Promotion de la Femme, l'Enfant, et de la Famille, MPFEF) has supported several urban shea producer unions. These are geographically focused and capital-intensive projects located in urban centers of Kayes, Koulikoro, Ségou, Sikasso, and Mopti. The unions' program has extensive and lofty goals (improved producer organization, quality, and

marketing) but is run exclusively through the MPFEF. The project is still in progress, due to conclude in 2009, and results remain to be seen.

Environment preservation and sustainability

Concerns have developed over the health and sustainability of the agro-forestry parklands where shea trees are found. For example, some sources believe that the shea trees are aging (resulting in a loss of productivity) and seedlings are not given the chance to sprout or mature because of current parkland management practices. In response, the Canadian International Development organization, CECI, as well as Peace Corps Mali are working with producer groups to maintain agro-forestry parklands (CECI, 2008; Perakis, Fieldwork, 2008). Agricultural research institutions, including the Institut d'Economie Rural (IER), IPR/IFRA de Katibougou, and ICRAF currently conduct research focused on reducing the maturation rate of shea trees through breeding techniques (Perakis, Fieldwork, 2006 and 2007) and developing easily replicable shea tree grafting techniques.

Key Leverage Points for Future Interventions

The quality of Malian shea is determined by primary producer and processor practices, and producer practices are influenced by the monetary compensation received from downstream marketing actors (traders, wholesalers, exporters, etc.). This important feedback throughout the subsector underscores the highly interdependent nature of the “structure-conduct-performance” framework (Jesse, 1978). A thorough understanding of potential responses at key leverage points is important to make policy recommendations within the value chain designed to promote improved quality and attain higher returns to primary producers. These leverage points are also critical points in the value-chain where information asymmetry or uncertainty exists, where actors (such as government) can play a

role in reducing information constraints or women's opportunity cost, or improve the reputation of shea "made in Mali."

In the domestic Malian shea subsector, these leverage points may include the primary producer or cooperative level (where primary quality is determined); the trader/middleman level (where quality verification may initially occur); the exporter or wholesaler level (those with the capital to store and process large quantities of shea and to create preferred-supplier relationships); and government (agencies with the potential to provide subsector oversight and facilitate coordination efforts). As previously discussed, the ability of women to produce large volumes of high quality shea nuts and butter also depends on interventions in those parallel subsectors that constrain women's time (complementary and competing markets). Regionally, trade-facilitating agreements and market information networks exist. It may be possible in the future to piggyback on these already established networks to facilitate trade flows in shea between countries. Drawing on the results from this subsector analysis, lessons from past interventions on the shea subsector, and the key leverage points identified above, the following section will discuss future areas of government, donor, and NGO support.

Future Interventions: Some Policy Recommendations

All future interventions aimed at simultaneously increasing shea product quality and revenues to primary producers should take into account economic incentives necessary to achieve such goals. This entails either compensating for quality or adjusting women's opportunity cost⁶⁵. Several realities suggest that collaborative work between the Malian government, donors, NGOs, research institutions, and the private sector will be most

⁶⁵ This is though, for example, labor-saving technologies in shea processing or other on-farm or intra-household activities (analogous to the WLFP arguments).

effective. First, efforts (both successful and unsuccessful) are often duplicated. Second, both pricing efficiency and improved quality rely on efforts by actors at various levels of the value chain (as well as in competing and complementary markets). Third, donor and local government funds for work such as value chain promotion have been reduced recently. These realities suggest that collaboration between subsector participants through arrangements like the “Task Force Approach” proposed by Harrison et al. (1974) will be essential for the successful implementation leveraged subsector interventions.

Recommendations to Government: National Scale Coordination and Risk Bearing

Drawing on evidence from the Burkinabé value-chain, Malian government may be best positioned to take on some of the risk associated with broad-based rural development efforts as well as coordinate, provide oversight, and endorse multiple value-chain activities with independent (but interrelated) goals— improved quality and reputation, returns to primary producers, and food security (reasonably priced vegetable oil for local consumption). In the subsector studies literature, this is referred to as the role of “channel captain.” Donors, NGOs, and the private sector have the potential support and bolster this effort through technical assistance.

First, although there are many actors in the value chain (government, donors, NGOs, entrepreneurs, cooperatives, and individual women), the unique characteristics of the shea economy are such that private incentives are not strong enough for any individual (entrepreneur or trading group) to take on the role of “channel captain”. Second is the role of shea in rural household food security. Shea fruit is consumed during lean season before cereal crops are harvested, shea butter is used extensively as a cooking oil (fat), and sales from shea products provide important cash income to many

Malian women. There are therefore multiple channels of production and consumption (geared toward the domestic and international markets) with their own specific role in the rural economy. The Malian government would therefore be a channel captain for multiple channels of production and consumption. Third, although there are no data to formally confirm this, evidence suggests that shea does make an important contribution to Mali's agricultural exports and gross domestic product (GDP). Fourth, Mali's reputation on the regional market is a public good. Fifth, the largest identified area of growth and future expansion is in cosmetics—with the highest and most stringent quality requirements. Efforts to establish and enforce grades and standards for this niche market will likely require active participation of government (and other subsector participants). Sixth is the direct and indirect role of complementary markets in shea production (water, fuel, transportation, and credit). Finally, the Malian government is already involved in the shea economy through the Ministry of Women's Affairs (MPFEF), the Rural Economics Institute (IER), the Agricultural University (IPR/IFRA), and the Agricultural Market Observatory (OMA). Together, these suggest the Malian government has an interest in developing the subsector and that it is best positioned to help take on the coordinating and risk-bearing role of channel captain.

Given the complexity and multiple actors (and roles) of the shea economy, it is not appropriate to simply charge the Ministry of Women's Affairs (MPFEF) with this task. Unfortunately, as noted by Buvunić and Mehra (1990), this type of arrangement is not uncommon in agriculturally focused women's income-generation projects in developing country settings. Although the MPFEF is the government agency most concerned with women's welfare, those providing advice and technical assistance through this ministry

likely do not have the level of expertise in agricultural marketing as the economists, extension agents, agronomists, and food scientists in the Ministry of Agriculture necessary to achieve the multiple goals and objectives outlined above.

Harrison et al. (1974) suggested a task-force approach to address agricultural marketing obstacles in situations much like the one in question. This involves bringing together interested government organizations, industry players from all levels of the value-chain, donors, and agricultural research institutions (domestic and international). Given the increasingly complicated international market, several actors at several levels of the marketing chain are now required to truly link farmers to markets. This collaborative approach has been successful in Burkina Faso (for shea) and more recently in Zambia (for cassava). In Burkina, government played the role of channel captain, while in Zambia, key industry leaders played important organizing and coordinating roles (Chitundu et al., 2006).

The second key role of a channel captain is as a risk-bearing entity. In the Malian setting, this would include investments in human and physical capital and information services directly and indirectly related in the shea economy. These efforts would likely be as part of more general agricultural sector development and rural conservation efforts and might touch on issues related to rural water, fuel wood, and credit availability, or extension programs designed from women.

Recommendations to Donors and NGOs: Support and Technical Assistance

Should government decide to take on the coordinating role outlined above, donors and NGOs will continue to provide important complementary services (local technical assistance) and support to the shea economy. First, they may help define and

support government activities. In this sense, the Malian government doubles as a key-leverage point. Donors and NGOs can provide support to the Malian government in the form of technical assistance and also contribute to or co-manage parts of their programs. These organizations may continue to help support regional experience-sharing efforts amongst actors (including government) of shea producing countries. Finally, these actors may be well positioned to help initiate and support public-private partnerships to develop the subsector.

An overarching observation is that cooperative organization and management frequently plays an important role in the incentives faced by primary producers in the creation and marketing high-quality goods. Therefore, a second key area where donors and NGOs may continue to play an important role is in producer group organization and management, including developing membership arrangements, grading and sorting, traceability, and marketing strategies and decisions.⁶⁶ This would be a continuation of many of the geographically focused efforts already in place. As we know, producers are very responsive to economic incentives. Therefore, donors and NGOs may encourage experience sharing and brainstorming within and between cooperatives and unions to determine how to align incentives at this level.

Rural female shea producers are highly immobile and have repeatedly referred to uncertain market outlets as a limiting factor to producing high-quality shea products (Perakis, Fieldwork, 2007)—underscoring the importance of linking farmers to markets with

⁶⁶ For example, the Zantiebougou cooperative established three grades of shea nuts (boiled and sun-dried, boiled and roasted, and buried and roasted), with the help of primary producers (members and non-members). Nuts were bagged and stored in the cooperative's storage facility. Women were then employed by the cooperative (at a wage of 750 to 1000 CFA F (US \$ 1.50 to \$2.00) per day) to use the multifunctional platform and improved methods to extract shea oil. This cooperative's president noted that buying finished butter from producers was problematic because of high levels of information asymmetry.

information. Therefore, a third area where donors and NGOs may play an important role is by disseminating information related to both market information and improved technologies and handling methods. This would likely most easily be accomplished through producer organizations at the village level and could be in collaboration with those involved with efforts to develop labor-saving technologies (such as the Malian government, IER, and the regional program, ProKarité) and market information services (OMA). Individual primary producers and producer groups mentioned an interest in having an “emission karité” (shea radio show) play once a week for primary producers to receive information on prices, handling methods and storage, and potential market outlets (Perakis, Fieldwork, 2007). This would be a true leveraged intervention in that a relatively small activity (a radio show) could directly reach a very large number of people—anyone with access to radio.

As discussed previously, exporters have been the targeted for much of the recent donor and NGO technical assistance in this subsector. These actors may also continue to benefit from the organization of a shea exporter (wholesaler) association for the purposes of (1) representing a unified position on agricultural and trade policy initiatives (as an interest group) and (2) experience sharing. For example, some exporters and wholesalers have established preferred-supplier relationships with rural cooperative groups. Others use their own quality-verification mechanisms, which may be transferable to the village level. The experiences of these entrepreneurs may provide insight into future leveraged interventions at the cooperative, wholesaler, or exporter levels. These private actors may also benefit from guidance and technical assistance from organization with experience with collaborative trader or exporter organization efforts (like CONESAM or ROESAO).

Current environmental and sustainability concerns in Mali are likely as diverse as this country's landscape. However, one major area of concern has been regarding the mature age of the country's shea trees and low regeneration rates. Therefore, a fifth area in which donors and NGOs may be well positioned to continue to provide support and technical assistance is in the area of agro-forestry parkland management and environmental sustainability. This would likely include training in natural resource management (tree-grafting and replanting) and would entail a joint effort between the producers who utilize this part of Mali's natural landscape and research organizations already engaged in such activities.

Finally, donors and NGOs may continue to help support public research in the shea sub-sector. This may include facilitating collaborative efforts (including exchange programs) for on-going research within the sub-region to identify labor-saving technologies or village-level quality testing mechanisms. This may also include financially supporting some of the identified extensions of this study and future research opportunities outlined below.

Extensions and Future Research Opportunities

The high opportunity cost of women's time has been identified as an important limiting factor in the production of high-quality shea nuts and butter. It will therefore first be vital to have a better understanding of women's time constraints in Mali's diverse agro-ecological zones and second develop tools or interventions to help lighten the burden of women's work in order to provide women with the incentives to improve shea handling methods and quality in the long term. Collecting this information may be integrated into part of more general studies of rural women's contribution to and benefits (income) from on-

farm and off-farm activities throughout the year. Cooperative organization efforts would also benefit from this information in that it could help explain producer organization dynamics and motivate alternative producer organization design.

Another use of this information would be in studies designed to identify the actual cost associated with producing, for example, one kg of shea butter. With more detailed information on differences in women's opportunity cost and costs of inputs of production (such as fuel wood and water), it may be possible to work out detailed budgeting and costing studies in order to better understand how the cost of producing shea butter (with either improved or traditional handling methods) varies across (or within) regions. Also of interest would be a detailed study of marketing costs and margins in shea butter production, processing, marketing and retailing to help understand how much more of the retail share rural women could possibly be expected to earn. These studies may be areas of potential future collaboration between Peace Corps, USAID, and universities.

Research into labor-saving capital and methods in both primary shea nut handling and competing agricultural activities should be prioritized in efforts to reduce women's opportunity cost. However, before new technologies are developed, a thorough understanding of the reasons for low adoption rates in the past is merited. In addition, such technologies often require imported capital (like solar panels) and cement flooring (see Figures 5 and 6) that are both expensive and difficult to come by in rural Mali. To overcome this issue, the modified cocoa dryers mentioned above, made of natural and locally available fibers, could be widely disseminated at low or no cost to primary producers and producer groups by extension agents or local NGOs. Another related area of future research may be to develop a method to easily test certain quality parameters at the village

level.⁶⁷ This will also require identifying which quality parameters matter and for which market channel (domestic or for export).

This research has pointed to the diverse sociological dimensions of shea production and consumption. In the future, would be helpful to understand, from a sociological or anthropological perspective, some of the motivations and dynamics involved with women's mobilization efforts and group work. Also, this study described the highly objective measures and perceptions of shea quality in the West. However, it will be helpful to have a greater understanding of the determinants of both producers' and local consumers' perceptions of shea quality in order to better understand the motivation behind the handling choices of producer. This will also be important for the ongoing regional efforts to develop grades and standards based on economically important attributes.

Unlike other shea producing countries, over 75 percent of shea produced in Mali is consumed locally. In some cases, shea nuts are exported and processed and shea butter (and other value-added products) are then imported from neighboring countries or Western Europe. Future research may help to identify the extent to which domestic buyers are willing to pay a premium for the handling methods preferred in industrialized nations (a function of local perceptions of and willingness to pay for different qualities of shea). Finally, some producer groups have already begun producing shea-based soaps for the domestic market. This suggests it may be worthwhile to understand the nature and scope of the domestic (and West African) demand for alternative value-added products such as soaps. The results of these future areas of research along with the implementation of the policy recommendations discussed above may help to improve the quality and reputation of

⁶⁷ Such as FFA levels, for example.

shea “made in Mali” — thereby enabling shea to fulfill its potential as a important source of rural income growth and help assure that women, throughout the world, benefit from all shea has to offer.

IX. References

Action for Enterprise. *Rapport de Synthèse de la Rencontre entre Exportateurs et Importateurs : Compétitivité et Défis de la Filière Malienne des Amandes de Karité*. Report prepared for USAID, ProKarité, ICRAF and CFE. Arlington, VA: Action for Enterprise, 2005.

Addaquay, J. *The Shea Butter Value Chain: Refining in West Africa*. WATH Technical Report 3. Report Prepared for the United States Agency for International Development. Accra, Ghana: West African Trade Hub (WATH), 2004

Akerlof, G. A. "The Market for 'Lemons': Quality Uncertainty and the Market Mechanism." *The Quarterly Journal of Economics* 84, no. 3, 1970: 488-500.

Alander, J. "Shea butter – a multifunctional ingredient for food and cosmetics." *Lipid Technology* 16, no 9, 2004: 202–205.

Altenburg, T. *Donor Approaches to Supporting Pro-Poor Value Chains*. Report Prepared for Donor Committee for Enterprise Development. Bonn, Germany: German Development Institute, 2007.

Etude de la Filière Karité au Mali. Rapport Provisoire Projet no 5-MLI-077. Bruxelles, Belgium: Association des produits à marché (APROMA), 1993.

Barrett, C.B., "Food marketing liberalization and trader entry: evidence from Madagascar." *World Development* 25, no 5, 1997: 763–777.

Becker, Laurence. Garden Money Buys Grain: Food Procurement Patterns in a Malian Village. *Human Ecology* 28, no 2, 2000: 219-250.

Behrendt, C. *The Cotton Sector in Mali: Realizing its Growth Potential*. Policy Insights no. 30. Issy-les-Moulineaux, France: OECD Development Center, 2006.

Berthe, Y, Coulibaly, A and Sanogo, Z. *Analyse de la Filière Amande de Karité Au Mali* Bamako, Mali: Institute D'Economie Rurale (IER), 2000.

Bingen, J. "Cotton in West Africa: A Question of Quality," in *Agricultural Standards: the Shape of the Global Food and Fiber System*, ed. Bingen J. and Busch, L. (Dordrecht, the Netherlands: Springer Publishing, 2006), 219-242.

Bingen, J. "Cotton, democracy and development in Mali." *Journal of Modern African Studies* 36, no 2, 1998: 265-285.

Bingen, J "Shaping our agro-food system: Whose standards count? Guest editor observations." *Agriculture and Human Values* 19, no 4, 2002: 279-281.

Bingen, J and Siyengo, A “Standards and corporate reconstruction in the Michigan dry bean industry.” *Agriculture and Human Values* 19, no 4, 2002: 311- 323.

Bingen, J. and Busch, L. *Agricultural standards: the shape of the global food and fiber system.* Dordrecht, the Netherlands: Springer Publishing, 2006.

Bingen J., Dembelé E., Camey D. *The Malian Union of Cotton and Food Crop Producers: its Current and Potential Role in Technology Development and Transfer.* London, England: ODI Agricultural Research & Extension Network, 1995.

Biyalogorsky, E. and Gestner, E. “Contingent Pricing to Reduce Price Risks.” *Marketing Science* 23, no 1, 2004: 146-155.

Bonkougou, E.G., Alexandre, D-Y., Ayuk, E.T., Depommier, D., Morant, P. & Ouadba, J-M. *Agroforestry parklands of the West African semi-arid lands. Conclusions and recommendations of an international symposium, ICRAF/SALWA, 25–27 Oct. 1993, Ouagadougou, Burkina Faso.* 1994.

Brandow, G. “Appraising the Economic Performance of the Food Industry,” in *Lectures in Agricultural Economics*, ed. Schultz, T.W., Adelman, I., Bishop, C.E., Fox, K.A., Brandow, G.E. (Washington, DC: USDA Economic Research Service, 1997), 81-100.

Buvinić, M. and Mehra, R. “Women and Agricultural Development.” In C.K. Eicher and J.M. Staatz (Eds.), *Agricultural Development in the Third World.* Baltimore, MD: The Johns Hopkins University Press, 1990: 290-308.

Campbell, G.R. “Grower-First Handler Exchange Arrangements in the Wisconsin Processed Vegetable Industry,” in *Coordination and Exchange in Agricultural Subsectors*, ed. Marions, B.W. (Madison, WI: Research Division, College of Agricultural and Life Sciences, University of Wisconsin, 1976), 29-42.

Caswell, J., A. “Using Industrial Organization and Demand Models for Agribusiness Research.” *Agribusiness* 8, no 6, 1992: 537-548.

Caves, R. *American Industry: Structure, Conduct, Performance.* Foundation of Modern Economics Series, Englewood Cliffs, N.J.: Prentice-Hall, 1992.

Center for International Studies and International Cooperation (CECI), “Support from CECI for the Shea Filière,” Montréal, Canada:
http://www.ceci.ca/ceci/en/medias_and_information/karite (accessed September, 2008).

Chalfin, B. *Shea Butter Republic: State Power, Global Politics, and the Making of an Indigenous Commodity.* New York, NY.: Routledge, 2004.

Chitundu, M., Droppelman, K., and Haggblade, S. "A Value Chain Task Force Approach for Managing Private-Public Partnerships: Zambia's Task Force on Acceleration of Cassava Utilization" Food Security Research Project Working Paper no. 21. Lusaka, Zambia: Michigan State University, 2006.

CIFOR 1998 Annual Report. Bogor, Indonesia: Center for International Forestry Research (CIFOR), 1998.

Charrouf, Z. "Morocco Country Compass: An argan oil cooperative is changing women's lives in Morocco" in *Non-Wood News* no 9 March 2002. Rome, Italy: Food and Agricultural Organization of the United Nations Forestry Department, 2002.

Dessalegn, G., Jayne, T., and Shaffer, D (1998). MARKET STRUCTURE, CONDUCT, AND PERFORMANCE: CONSTRAINTS ON PERFORMANCE OF ETHIOPIAN GRAIN MARKETS. <http://www.aec.msu.edu/fs2/ethiopia/wp8.pdf>

Deaton, A. "Commodity Prices and Growth in Africa." *The Journal of Economic Perspectives* 13, no 3, 1999: 23-40.

Deaton, A. and Miller, R. *International Commodity Prices, Macroeconomic Performance, and Politics in Sub-Saharan Africa*. Princeton Studies in International Finance 79. Princeton, NJ: Department of Economics Princeton University, 1995.

DeGroot, H. and N. Coulibaly. "Gender and generation: an intra-household analysis on access to resources in Southern Mali." *African Crop Science Journal* 6, no 1, 1998: 79-95.

Derks, E. and Lusby, F. *Mali Shea Kernel Value Chain Case Study. Report Prepared for ACDI/VOCA with funding from USAID*. Washington, DC: ACDI/VOCA, 2006.

Doumbia, F and Keita, M. *Le Karité Au Mali, du Ramassage à la Transformation Traditionnelle : Exemple des Arrondissements de Siby et de Narena au Manding*. Mémoire de Fin D'Etudes. Bamako, Mali: Ecole Normale Supérieure en Histoire, 1987.

Elias, M. *Globalization and Female Production of African Shea Butter in Rural Burkina Faso*. Master's thesis. Los Angeles, CA: University of California, Los Angeles, 2003.

Elias, M., Bayala, J. and Dianda, M. "Impediments and innovations in knowledge sharing: the case of the African shea sector." *Knowledge Management for Development Journal* 2, no 1, 2006: 52-67.

Esteulle, B., Mercier, D., Perennes., J. *African Cotton Production Season 2006-2007*. DAGRIS Market Report No 16, March, 2007. Monceau, Paris: Service Communication et Relations Publiques de la Présidence de DAGRIS, 2007.

Fafchamps, M., "Industrial structure and microenterprises in Africa." *Journal of Developing Areas* 29, no 1, 1994: 1–30.

FINTRAC, Inc. *L'achat et la Vente du Beurre de Karité: Manuel de Commercialization pour l'Afrique de L'Ouest*. Report prepared for USAID. Washington, DC: FINTRAC, Inc, 2002.

FLEURY, J. M. "The Butter Tree", IDRC Reports 10, no 2. Ottawa, Canada: IDRC Publications, Ottawa, 1981: 7-9.

Fobil, J.N., "Bole, Ghana: Research and development of the shea tree and its products," New Haven, CT: HORIZON Solutions International, <http://www.solutions-site.org/artman/publish> (accessed September, 2007).

Fold, N. "A Matter of Good Taste? Quality and the Construction of Standards for Chocolate Products in the EU." *Cahiers d'économie et sociologie rurales* 55-56, 2000: 92-110.

French, B. "The Sub-sector as a Conceptual Framework for Guiding and Conducting Research." *American Journal of Agricultural Economics* 56, no. 5, 1974: 1014-22.

Garoyan, L. "Producer-First Handler Exchange Arrangements for Selected California Processed Fruits, Vegetables and Nuts", in *Coordination and Exchange in Agricultural Subsectors*, ed. Marions, B.W. (Madison, WI: Research Division, College of Agricultural and Life Sciences, University of Wisconsin, 1976),13-28.

Gender and Trade (G&T), "Wild Shea Tree Benefiting Burkina Faso: Women Engaged in the Sector Gain from Trade in 'Shea Butter,'" London, England: Commonwealth Secretariat, Gender and Trade, <http://www.genderandtrade.org/gtinformation> (accessed September, 2007).

Hagblade, S. and Gamser, M. *A Field Manual for Sub-sector Practitioners*. Gemini Project Technical Notes no. 1, Washington, DC: Development Alternatives, Inc (DAI), 1991

Harrison, K., Henley, D., Riley, H., and Shaffer, J. "Improving Food Marketing Systems in Developing Countries: Experiences from Latin America." Research Report No. 6, Latin American Studies Center. East Lansing, MI: Michigan State University, 1974.

Harsch, E., "Making trade work for poor women: Villagers in Burkina Faso discover an opening in the global market," *Africa Recovery* 15, December, 2001, <http://www.un.org/ecosocdev/geninfo/afrec/vol15no4/154shea.htm> (accessed September, 2007).

Henson, S and Reardon, T. "Private agri-food standards: Implications for food policy and the agri-food system." *Food Policy* 30, no. 3, 2005: 241–253.

Hildreth, R., Krause, K., and Nelson, P. "Organization and Control of the U.S. Food and Fiber Sector," *American Journal of Agricultural Economics* 55, no 5, 1973: 851-859.

Hines, P., Bailey, K. and Francis, M. "Contingent approaches to quality-based pricing within the agrifood industry." *International Journal of Logistics: Research and Applications* 9, no. 3, 2006: 223-235.

Holtzman, J. *The Shea Butter Value Chain: Study Synthesis and Recommendations for WATH*. West African Trade Hub Technical Report 1. Report prepared for the United States Agency for International Development. Durham, NC: Abt Associates, 2004.

Hueth, B., Ligon, E., Wolf, S. and Wu, S. "Incentive Instruments in Fruit and Vegetable Contracts: Input Control, Monitoring, Measuring, and Price Risk." *Review of Agricultural Economics* 21, no. 2, 1999: 374-389.

Hyman, E. "A Comparison of Labor-Saving Technologies for Processing Shea Nut Butter in Mali." *World Development* 19, no. 9, 1991: 1247-1268.

Jacobs, J. "Fruit and Vegetable Cooperatives" in *Farmer Cooperatives in the United States*. Cooperative Information Report 1, section 13. United States Department of Agriculture Agricultural Cooperative Service. Washington, DC: 1990, 5-9.

Jaffee, S. and Morton, J. (eds.) *Marketing Africa's High-Valued Foods: Comparative Experiences of an Emergent Private Sector*. Dubuque, IA: Kendall/Hunt Publishing Company, 1995.

Jaffee, S. and Gordon P. *Exporting High-Valued Commodities: Success Stories from Developing Countries*. Washington, DC: World Bank, 1993.

Kaboré, R. "Le Karité au Burkina Faso" in *Le Karité et le Néré Deux Arbres des Jachères Propriété Masculine et Travail Féminin au Burkina Faso*, ed. Ftaïta, T. (L'Harmattan, Paris, France, 2007), 15-70.

Klitgaard, R. *Adjusting to Reality: Beyond "State Vs. Market" in Economic Development*. San Fransisco, CA: ICS Press, 1991.

Larocca, A. "Liquid Gold in Morocco." *New York Times*. New York, NY. November 18, 2007.

Lovett, P. *The Shea Butter Value Chain: Production, Transformation and Marketing in West Africa*. WATH Technical report no 2. Washington, DC: United States Agency for International Development, 2004.

Lovett, P. Opening Bottlenecks in the African Shea Butter Industry. Report prepared for the United States Agency for International Development. Washington, DC: EnterpriseWorks Worldwide, 2004.

Lovett, P., Miller, E., Mensah, P., Adams, V., and Kannenberg, C. Guide à L'exportation du Beurre de Karité. Report prepared for the United States Agency for International Development. Accra, Ghana: The West African Trade Hub, 2005.

Lusby, F. and Derks, E. "Shea Kernels from Mali: A Value-Chain Case Study." *Small Enterprise Development* 17, no 12, 2006: 36-46.

Lybbert, T., Barrett, C. and Narjisse, H. "Market-based Conservation and Local Benefits: The Case of Argan Oil in Morocco." *Ecological Economics* 41, no. 1, 2002: 125-144.

Maïga, A. Étude de la situation et de l'évolution des systèmes de vulgarisation et d'animation forestière en Afrique Sahélienne. Rome, Italy: Food and Agricultural Organization of the United Nations (FAO), 2004.

Macho-Stadler, I. and Pérez-Castrillo, J.D. (2001) "An Introduction to the Economics of Information: Incentives and Contracts." Oxford University Press. New York, NY.

Maranz, S. "Shea Composition Database, 2004" <http://prokarite.org/vitellaria-dbase/fat-percentage.html> (accessed 2007).

Maranz, S. and Wiesman, Z. "Evidence for indigenous selection and distribution of the shea tree, *Vitellaria paradoxa*, and its potential significance to prevailing parkland tree patterns in Sub-Saharan Africa north of the equator", *Journal of Biogeography* 30, no. 10, 2003: 1505-1516.

Masters, E.T. et al. "Reinforcing Sound Management through Trade: Shea Tree Products in Africa." *Unasylva* 21, 2004:, 46-52.

May, O.L. (2003). Breeding Cotton With Enhanced Fiber Qualities Amidst Technologically Evolving Yarn and Textile Manufacturing Industries. The World of Cotton—Developments and Remedies. 62nd Plenary Meeting, Gdańsk, Poland.

McGlinchy, M. *Identifying the Determinants and Characteristics of Mother's Income in Rural Mali*. Masters Thesis. East Lansing, Michigan State University. 2006.

McMillan, J. *Reinventing the Bazaar A Natural History of Markets*. New York, NY. : W. Norton & Company, 2002.

"artisan." Merriam-Webster Online Dictionary 2008. <http://www.merriam-webster.com/dictionary/artisan> (accessed July, 2008)

National Research Council, NRC. *Lost Crops of Africa: Volume II: Vegetables*. Washington, DC: National Academies Press, 2006.

The African Organization for Standardization and the Ghana Standards Board, "Draft Regional Shea Standards (butter and nuts)," Normes Karité, 2006, http://www.normeskarite.net/CTR_commentaires.html (accessed 2007 and 2008).

Nouvellet, Y., Kassambara, A. and Besse, F. "Shea Tree Orchards in Mali: Inventory, Volume, Crown and Fruit Production." *Bois et Forêts des Tropics* (CIRAD) 287, no 1, 2006 :1.

Olmstead, A and Rhode, P "An Overview of the History of California Agriculture," in *California Agriculture: Present and Future*, ed. Siebert, J.B. (Davis California: Giannini Foundation, Division of Agriculture and Natural Resources, University of California, August, 1997), 1-27.

Observatoire du Marché Agricole, "Bulletin de Conjoncture." Bamako, Mali, Octobre, 2007. http://www.aec.msu.edu/fs2/mali_fd_strtgy/bulletin_de_conjoncture_octobre_2007.pdf (accessed, November, 2007).

Otsuki, T, Wilson, J. S. and Sewadeh, M. "Saving two in a Billion: Quantifying the Trade Effect of European Food Safety Standards on African Exports." *Food Policy* 26, no 5, 2001: 495-514.

Perakis,S. Fieldwork. Mali 2006 and 2007.

Pumareda, L., Henry, F, Charrouf, Z., Pauly, G., and Falconnet, G. "Environmental Impact of Argan Leaf Production." *Bois et Forets Tropiques* (CIRAD) 287, no 1, 2006: 3.

RAISE, "Market and Technical Survey: Shea Nuts" Washington, DC: Prepared by RAISE for Fintrac, Inc, 2002, <http://www.raise.org/natural/pubs/shea/shea.stm> (accessed 2007 and 2008).

Reardon, T (2005) International Agricultural Development. AEC 861. East Lansing, MI: Michigan State University. Fall, 2005.

Reardon, T., Codron, JM., Busch, L Bingen, J. and Harris, C. "Global Change in Agrifood Grades and Standards: Agribusiness Strategic Responses in Developing Countries," *International Food and Agribusiness Management Review* 2, no 3-4, 2001: 421-435.

Reardon, T., J. M. Codron, L. Busch, J. Bingen, and C. Harris. "Changing Strategic Roles of Food and Agricultural Standards for Agrifood Industries." Selected paper presented at the International Food and Agribusiness Management Association World Congress, Florence, Italy. 1999.

Russo, L and Etherington, T. (Eds.) "Non-Wood News: An Information Bulletin on Non-Wood Forest Products." Volume 8. Rome, Italy. Food and Agricultural Organization of the United Nations, 2001.

Rutherford, D. *Routledge Dictionary of Economics* Second Edition. New York, NY, USA: Routledge, 2002.

Sallé, G., Boussim, J., Raynal-Roques, A., and Brunck, F. "Le Karité Une Richesse Potentielle : Perspectives de Recherche Pour Améliorer sa Production." *Bois et Forêts des Tropiques* 228, no. 2, 1991 :11-23.

Sanou, H., Picard, N., Lovett, P., Dembélé, M., Korbo, A., Diarisso, D. and Bouvet, J.M. "Phenotypic variation of agromorphological traits of the shea tree, *Vitellaria paradoxa* C.F. Gaertn., in Mali." *Genetic Resources and Crop Evolution* 53, 2006: 145–161.

Shaffer, J. "On the Concept of Sub-sector Studies." *American Journal of Agricultural Economics* 55, no. 2, 1973: 333-335.

The Shea Network, "Mali," <http://www.thesheanetwork.net> (accessed 2007 and 2008)

Sow, Fatoumata. *Le Beurre de Karité: Extraction Valeur Alimentaire et Importance Socio-Economique au Mali*. Mémoire de Fin d'Etudes. Bamako, Mali : Ecole Normale Supérieure, 1987.

Statz, J.M. *Food System Organization and Performance*. AEC 841. East Lansing, MI: Michigan State University. Summer, 2007.

Statz, J.M. *Notes on the Use of Sub-sector Analysis as a Diagnostic Tool for Linking Industry and Agriculture*. MSU Agricultural Economics Staff Paper 07-04. East Lansing: February, 1997.

Statz, J. M. "Farmers' incentives to take collective action via cooperatives: A transaction cost approach." In J. S. Royer (Ed.), *Cooperative Theory: New Approaches*, ACS Service Report 18. Washington, DC: U.S. Department of Agriculture, Agricultural Cooperative Service, July 1987, 87- 107.

Stanford, L. "Constructing "quality": The political economy of standards in Mexico's avocado industry." *Agriculture and Human Values* 19, 2002: 293-310.

Stathacos, C. *The Shea Butter Value Chain: The US Market Study*. WATH Technical Report 4. Report Prepared for the United States Agency for International Development. Accra, Ghana: West African Trade Hub (WATH), 2004

Tefft, J. *Mali's White Revolution: Smallholder Cotton from 1960 to 2003*. Paper presented at the InWEnt, IFPRI, NEPAD, CTA conference "Successes in African Agriculture." Pretoria, South Africa. 2003.

Tefft, J. BUILDING ON SUCCESSES IN AFRICAN AGRICULTURE Mali's White Revolution: Smallholder Cotton from 1960 to 2003. 2020 Vision Focus 12, Brief 5. Washington, DC: International Food Policy Research Institute (IFPRI), 2004.

The United Nations Development Program, "Partnering for Development," New York, NY: United Nations Development Program, http://jposc.org/documents/workshop_hanoi_UNDP_aarhus_united_folder.pdf (accessed, 2007)

The United Nations Member States, "United Nations Millenium Development Goals," <http://www.un.org/millenniumgoals> (accessed 2007).

Vincenzo, D., Maranz, S., Serraiocco, A., Vito, R., Wiesman, Z., and Bianchi, G. Regional Variation in Shea Butter Lipid and Triterpene Composition in Four African Countries: *J. Agric. Food Chem.* 53, no. 19, 2005: 7473–7479.

Wessen, P. D. *Institutional Economics of Arabica Coffee Marketing in Cameroon*. Dissertation. East Lansing, MI: Michigan State University. 1998

The West Africa Trade Hub. "The Shea Value Chain: A Uniquely African Industry." Accra, Ghana: The West African Trade Hub <http://www.watradehub.com/images/stories/downloads/studies/Shea%20value%20chain.pdf> (accessed July, 2008).

The World Bank. *Implementation Completion and Results Report on the Economic Policy and Public Finance Management Credit*, Report ICR0000543. Washington, DC: The World Bank, 2007.

YIRIWA Conseil. *Etude pour la Promotion des Filières Agro-Industrielles*. Report prepared for Centre Agro-Entreprise/Chemonics. Bamako, Mali : YIRIWA Conseil, 2001.