

Quality and supply chain integration in natural resource production systems: a first step toward eco-labeling?

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Abstract: Commercial non-timber forest product extraction generates and diversifies household income and ostensibly provides incentive to protect forest ecosystems. However, once these resources can be procured outside of the forest by cultivation, extractive systems often tend toward unsustainable practices. The economic and environmental effects of shifts in procurement ultimately resonate throughout forest livelihood systems. This has been the case for extractors of *Chamaedorea* palms (*Chamaedorea* spp), which are harvested from tropical forests in Mexico and Guatemala and used in floral arrangements and in Easter celebrations. NTFP certification has emerged as a strategy to facilitate the continuance of integrated conservation and economic benefits. Eco-labeling efforts for palms began in 2001 and a small, but growing demand characterizes today's market. The objective of this paper is to assess 1) the components of the global *Chamaedorea* value chain and 2) the dimensions of palm markets, as one part of a multi-scale analysis of the global palm system that is being undertaken to evaluate the feasibility certified *Chamaedorea* palm fronds, and their potential to promote both forest conservation and economic development in a particular location. Published literature on *Chamaedorea* palm procurement was used to establish basal understanding of the makeup of the international value chain. We undertook a modified Sondeo (rapid appraisal) to obtain greater detail about specific actors and institutions. Finally, we conducted a traditional market analysis to gather data pertaining to the dimensions of the global markets. Three important observations emerged. First, seasonality of certified demand suggests that extractors will confront challenges adjusting year-round processes to accrue benefits for a single season. Second, producers will likely face barriers to entry stemming from a mature market and an oligarchic supply chain. Third, economies of scale for certified product represent a significant obstacle throughout the supply chain. We conclude that the emerging certification standards should incorporate quality standards based upon existing industry guidelines. This should improve the likelihood that certified palms retain appeal to intermediate buyers as well as the niche end consumer. Over the long-term, this "quality approach," manifested in part through vertical integration of early-stage processing, may represent a crucial intermediate step in the linked development of certified producers and markets.

Keywords: non-timber forest product, value chain, quality, conservation

Introduction

One important outcome of the Amazonian extractive reserve model developed in the late 1980s was a renewed interest in non-timber forest products (NTFP) and their potential role in the integration of livelihood and conservation objectives. Supporters of commercial NTFP extraction envisioned two synergistic benefits of NTFP commercialization: rural livelihood improvement and tropical forest conservation (Nepstad and Schwartzman, 1992; Panayotou, 1992). NTFP commercialization initiatives mushroomed, followed by investigation into the efficacy of these endeavors. In time, NTFP certification (Shanley, *et al.*, 2002; Shanley, *et al.*, 2005) emerged as one response to the many pitfalls of commercialization identified by experience and complementary research (Browder, 1992; Dove, 1994; Homma, 1996). And although certification was described nearly 15 years ago as "key" to the integration of conservation and development through extractivism (Clay, 1992), NTFP certification remains in its infancy (Shanley, *et al.*, 2005). This paper examines the components and dimensions of the international value chain for *Chamaedorea* palms as one part of a multi-scale analysis of the global palm system that is being undertaken to evaluate the feasibility of certified *Chamaedorea* palm fronds and the potential for their certification to promote both forest conservation and economic development in a particular location.

Few genera of palms rival *Chamaedorea* for variety in foliage, size, and growth habit (Hodel, 1992). Trade of *Chamaedorea* specimens and the cultivation of plants from seed can be dated to the 19th

century; however, large-scale procurement and distribution did not begin until the middle of the 20th century (CEC, 2002). The harvest of palm leaves followed rapidly, and since the 1950s North American and European florists have used the imported leaves of several species from the genus *Chamaedorea* as decorative foliage in floral arrangements. Churches also use the large fronds of certain species for Palm Sunday celebrations (CEC, 2002). Today, palms are sourced from several states in Mexico as well as Guatemala and Belize. Markets for these palms exist in North America and throughout Europe as well as in the countries of their origin. Palm frond procurement has gradually been advancing along the path from forest extraction to cultivation in plantations, and the integrated livelihood and conservation benefits associated with palm extraction have diminished accordingly. While early *Chamaedorea* research primarily focused on palm taxonomy and biology, recent studies have addressed emerging palm markets (CEC, 2002), harvest economics and sustainability (Bridgewater, *et al.*, 2006; Endress, *et al.*, 2006), and certification (Pickles, 2004; Wilsey and Radachowsky, 2007). Certification of palm management and extraction has been suggested as a counter-measure to the plantation trend (Current, *et al.*, 2003). Limited and qualified success in the certification of other NTFP suggests that further consideration should be given to this approach. A unifying, or integrated analytical approach and two specific areas of inquiry are suggested by the NTFP literature.

Conceptual Framework

What is the best perspective from which to view NTFP procurement systems when the objective is to affect positive change? One of the important lessons to emerge from recent experience with NTFP commercialization is the need for an integrated value chain perspective (Belcher and Schreckenberg, 2007). Hopkins and Wallerstein (1986, p.159) provided an early conceptualization of the Global Commodity Chain (GCC) as, "The network of labor and production processes whose end result is a finished commodity." It is comprised of all parallel and interconnecting permutations of production-to-consumption systems. Contrary to the name, however, the GCC is a network, not a linear structure. The GCC concept is also evident in Blowfield's later conceptualization of the value chain (Blowfield, 2001), which he described as the "complex web of [actors] that affect the production-to-consumption process." In both cases, and irrespective of the intended application of the concept, emphasis is placed on the holistic, integrated system. Indeed, in considering the feasibility of certified *Chamaedorea* palms, it seems pragmatic to take an integrated analytical approach in two areas.

First, taking an integrated perspective with respect to the numerous and varied actors throughout the value chain benefits consideration of potential outcomes of and obstacles to certification. In general, NTFP certification has typically emphasized production processes (e.g. social justice, environmental sustainability) more so than product attributes (e.g. quality) (Ervin and Mallet, 2002). Process-oriented standards target producers, but also affect actors throughout the production-to-consumption system. A simple example is the need to keep certified products physically separate from conventional product throughout the supply chain, a requirement that impacts handling by all actors in the system. In practice, the decision by any given producer to certify may not adequately consider the economies of scale necessary for other actors or enterprises throughout the value chain to handle certified production profitably. Profitability, of course, is a business fundament and failure to consider it in certification efforts or other interventions may quickly precipitate market failure.

Second, analysis of the palm market also benefits from an integrated perspective. Discussion of the "palm market" inherently refers to potential sub-markets differentiated by region, end use, or other considerations. Certification strategies are 'market-based' in that they "seek to achieve their goals by restructuring producers' relationships to consumers through markets" (Meidinger, 2003: p.266). Thus, understanding the full complexity of existing and potential markets will likely improve the efficacy of a market-based intervention. In a study of the forestry sector, Overdevest (2004: p.174) observed that strategies for certifying "high-standard coded products" are limited by an inability to create markets for the certified goods, specifically with regard to creating a critical mass of supply. In the case of *Chamaedorea* palms, where demand is incipient, it is conceivable that market failure could equally result from insufficient consumer demand. Thus, both the overall size of both supply and demand, as well as their dynamics, should be considered influential factors in the success of NTFP certification efforts (Ros-Tonen, *et al.*, 1995; Shanley, *et al.*, 2005; Belcher and Schreckenberg, 2007).

For the above reasons it is insufficient to examine a particular production system or emerging market niche in isolation. These components must be viewed and understood from an integrated perspective as part of a broader commodity system. Despite considerable present enthusiasm for the certification

of palm management and extraction, to date, little to no effort has been made to integrate localized certification efforts into a comprehensive framework that links the numerous and diverse Chamaedorea procurement systems and markets.

Hypothesis and Research Objectives

The overarching objective of this paper is to evaluate certified Chamaedorea using an integrated value chain and market perspective as one component in a broader strategy to evaluate certification as an intervention to facilitate forest conservation and economic development in a particular location. Alternately stated: what do we learn about the likely outcomes of (or obstacles to) palm certification by focusing on the broader palm value chain and market? We hypothesized that the feasibility of certification would depend in part upon the attributes of certified supply and demand relative to the supply and demand for conventional product in the global market. Use of the term attributes, rather than values, highlights the importance of understanding not only overall supply and demand values, but also the nature of these values (Belcher and Schreckenberg, 2007) with regard to aspects such as seasonality and year-to-year stability. Moreover, it is important to understand the components of overall supply and demand, respectively the principal producers and consumers.

A complete description of a value chain includes three important elements (Kaplinsky and Morris, 2001; Marshall, *et al.*, 2006): 1) important actors and their activities; 2) key trade routes; and, 3) main consumers. We add a fourth element to those described above: an understanding of the attributes of supply and demand. Taken together, these four elements coalesce into two specific research objectives of this paper:

Research Objective 1. Identify the *components* of the integrated palm value chain: prevailing production systems, regions, and key actors

Research Objective 2. Describe the *dimensions* of the integrated palm market

Materials and Methods

The process of identifying the components of the integrated palm value chain and establishing its market dimensions was initiated through the first author's previous research and further informed by consultation of the more recently published literature on Chamaedorea palms, palm production, and markets. These studies provided a reasonably comprehensive overview of Chamaedorea production systems and regions as well as insight into the dimensions and dynamics of national and international markets for palm fronds.

Aggregate national trade data were procured through government reports organized using the harmonized tariff schedule, which is based on the international reporting system established by the World Customs Organization. Chamaedorea palm frond data are typically aggregated with figures for other foliage, branches, and like products. In the United States, Chamaedorea palm import data are classified using the Foreign Agricultural Service's (FAS) Foreign Agriculture and Trade system (FATUS). Mexico's National Institute for Geographic Statistics and Information (INEGI, in Spanish) similarly aggregates trade data for Chamaedorea palm fronds with data for other live plants and floriculture products (CEC, 2002). Finally, Guatemala's aggregate data can be found within the *Ventanilla Unica*, managed by AGEXPORT.

The U.S. Department of Agriculture (USDA) Agricultural Marketing Service (AMS) also provides disaggregated trade data through their online portal (AMS, 2007). Mexico's SEMARNAT and Guatemala's National Commission for Protected Areas (CONAP) maintain records on the authorized transport of Chamaedorea palms (Reyes Rodas and Wilshusen, 2006). All data were standardized when possible through the conversion of the differently reported units to *stems* (Table 1). Temporal inconsistencies (e.g. the AMS 10-year moving window) were addressed by synthesizing data from multiple sources.

Mexican and Guatemalan reporting of production and/or transport, rather than export, data allows for the possibility that significant quantities of illicitly harvested and exported palm may escape counting in national statistics. Thus, in characterizing the market we have elected to use the US import statistics rather than national or regional production and transportation figures in order to avoid the problem of underreporting resulting from illicit harvesting or other factors. There are obvious limitations characterizing a multi-national system using U.S. import data, but since much of the internationally

distributed palms supply passes through U.S.-based intermediaries, we concluded that this represented the best strategy.

Table 1. Select equivalencies in reported units

Quantity	Unit A	Quantity	Unit B
1	Bunch	20	Stems
1	Roll	30	Bunches
1	Gruesa ¹	144	Stems
1	Gruesa (<i>C.elegans</i>)	0.95	Kg

¹ In practice gruesas can contain fewer stems

Finally, system-level information as well as specific details about the actors and institutions comprising and influencing the integrated Chamaedorea value chain was collected through use of a “modified Sondeo” method. A Sondeo is a rapid assessment method developed to facilitate holistic understanding of particular systems, notably farming systems (Hildebrand, 1981). Because the Sondeo method was developed for use in a particular location, the method required some modification, if only to allow for the challenges imposed by working within the expanded geographic footprint of the palm value chain. First, the method was developed for use by an interdisciplinary team of researchers working within a community or region. For this phase of research, which extended beyond the zone of influence of many local and regional institutions, a single researcher with interdisciplinary training conducted the Sondeo. Second, the Sondeo calls for conversations with key informants to transpire over the course of several days to a week. In this research, conversations were, by necessity, dispersed over three extended field visits, which occurred between the summer of 2005 and the summer of 2007.

Results

Components of the Integrated Value Chain

Production Systems

Extraction

Historically, most commercial palm leaves have been extracted from naturally occurring populations in which regeneration is a natural process. Even today, a large part of the palms encountered in markets originate in relatively unmanaged forest ecosystems (Everett, personal communication). Extractive systems vary with location but the procurement process is fairly uniform. An individual or team of extractors enters the forest on foot in search of naturally occurring palms or palm clusters. Trips to and from the forest frequently require several hours of walking. In many regions, sustained commercial pressure on the resource has over time increased distances from communities to harvesting locations. Palm fronds are cut by hand to meet local and/or industry specifications using a modified machete or a knife. Extractors bundle the fronds into *gruesas* (ideally 144 stems, but varied in practice); *gruesas* are later assembled into *bultos* (*gruesas* bound or wrapped by burlap or blankets). The number of *gruesas* in a *bulto* depends on the carrying capability of the harvester, but a *bulto* typically does not exceed ten *gruesas*. Carrying the *bulto* on their backs, extractors hike out of the forest or, in some contexts, to a central collection point in the forest so animals or pickup trucks can bring out the palms. Extracted palms are typically sold to middlemen, or *coyotes*, who may reside in the harvester’s community or who may simply visit periodically to buy palms. Traditionally, extractors have been paid based on the *quantity* of *gruesas* harvested. In recent years there has been an effort in some areas to shift to *quality*-driven purchasing (CEC, 2006). Selection and processing typically occur further along in the value chain.

Cultivation

Palm plantations in agroforestry systems are the second important source of supply. As with many NTFP, there is a growing trend toward system intensification and palm cultivation. Unlike the relative uniformity of the extractive experience, plantations can take varied form. Perhaps the most (commercially) successful plantation system is cultivation under the natural forest canopy in recovering forest fallow. In this system, existing understory vegetation is cleared and palm plants are transplanted – from germinated seed stock – under the requisite shade of the original tree canopy. Coffee production systems represent another context within which palms are cultivated. Both the traditional

polyculture and rustic coffee production systems common to Mexico contain a diverse assortment of commercial and useful species and palm fits well within these diversified systems. Palms have also been observed in cultivation under the shade of rubber tree plantations.

Production Regions

Palm fronds destined for sale or redistribution in the United States have principally been procured from Mexico and Guatemala, the former responsible for the greater share over the products' commercial history (CEC, 2002) (Figure 1). Figure 1 is deceptive, however, in its portrayal of overall production: not all palms enter the U.S. prior to broader distribution. As a case in point, In 2005 Guatemala shipped principally to Holland (48.4%), followed closely by the United States (46.6%) (Reyes Rodas and Wilshusen, 2006). Nevertheless, Mexico remains the leading producer even with Guatemala's production figures doubled. Palms from Belize are reaching international markets via illicit extraction by Guatemalan harvesters, who for years have been crossing the contested Guatemala-Belize border to cut fronds (Bridgewater, *et al.*, 2006).

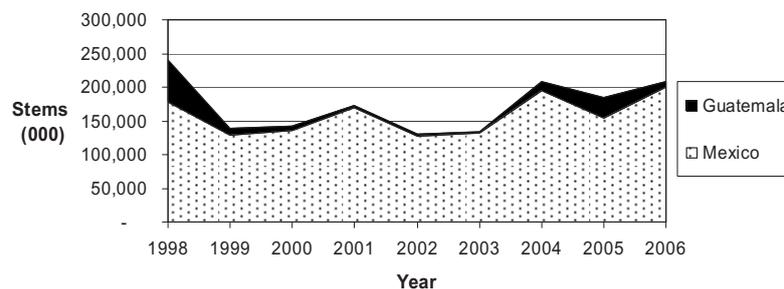


Figure 1. Annual imports to the U.S. from Guatemala and Mexico (AMS, 2007) (adapted from CEC 2002)

Mexico

There are several important palm regions within Mexico. One of the most important, in terms of volume, is the *Los Tuxtlas* region in the state of Veracruz. In Veracruz, palms are primarily cultivated under the shade of fallow forest. Another is the *Ri  Cajonos* valley in the state of Oaxaca's *Chinantla* region, where extraction remains a time and resource intensive production activity. The states of Chiapas and Tabasco are also important sources of extracted palms (Camarena M, 2005): historically, a large majority have originated from the region's *Selva Lacandona*. Another important extraction region in Chiapas extends along the *Sierra Madre de Chiapas*, a coastal range beginning in Oaxaca's *Chimalapas* region and running southeast toward Guatemala. In the northeastern state of Tamaulipas, the *El Cielo* Biosphere Reserve is another important palm extraction region (Endress, *et al.*, 2006). Finally, San Luis Potosi is known to have significant palm activity.

Guatemala

Most of the Guatemala's *Chamaedorea* is extracted from the naturally occurring populations within the Maya Biosphere Reserve – a mosaic of protected areas in the country's northernmost department: El Pet n (Reyes Rodas and Wilshusen, 2006). A direct-sale agreement in 2005 to commercialize palms between the largest U.S. palm importer and two community forest concessions – Uaxact n and Carmelita – represents a landmark development in the value chain and the creation of a certified market. Palm management in both concessions is governed through an addendum to FSC certification for sustainable forest management, the latter a legal stipulation for the community concessions. Terms of the arrangement specify that the palms must meet product quality, rather than process sustainability standards. Palms can be sold to conventional markets based on their quality, as well as to seasonal consumers interested in certified palms. Moreover, the concessions integrated procurement system includes many of the value-added processes formerly handled by intermediaries and consolidators.

Principal Actors

Actors in specific production-to-consumption systems can differ by region, as can their specific roles and the general shape of the systems themselves. Figure 2 portrays a general schematic model of the

integrated value chain and its numerous actors and variations along the path to the international market.

Extractors comprise one foundation for the palm commodity system. In most contexts, extractors operate independently, selling their harvest to an intermediary or other consolidator. Local contractors may also organize harvesters, or a community-level association may organize them. Recent emphasis on the certification of palm production systems is driving new emphasis on models within which both communities and harvesters take more responsibility for delivering a quality – or value added – product.

Cultivators represent the other foundation for the palm procurement system. Cultivators include both large operations, such as the 90-hectare *Flor de Catemaco* in Veracruz, Mexico, or cooperatives comprised of relatively smaller growers, such as *Tropicales de los Tuxtlas*, also in Veracruz. Palm cultivation by households in extractor communities has been promoted and observed, but it is extremely difficult to differentiate mode of production in those contexts.

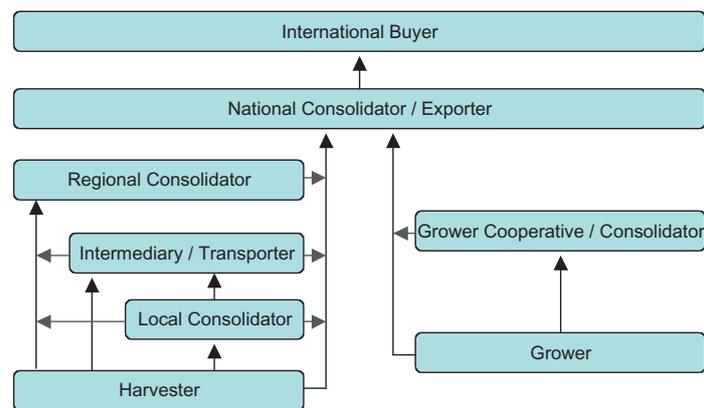


Figure 2. General Schematic Model of the Integrated Value Chain for *Chamaedorea Palm*

Intermediaries, or *coyotes*, operate both independently and as formal or informal employees of larger actors throughout the value chain. Intermediaries are frequently disparaged for exploiting extractors, but they often play important, yet under-valued roles in the commercialization process. In some cases, the coyotes are themselves former extractors who have developed relationships with actors further up the value chain. One role of the intermediary is the provision of transportation for extractors without a means to get their palms from the forest to the market. In the economically marginal regions where *Chamaedorea* palms are found, this role must not be understated. Another role of the coyote is to stabilize supply through the consolidation of small quantities of palms harvested over a broad area, or by numerous harvesters. When institutions such as producer/extractor cooperatives are absent, it can be the coyote that helps to ensure that minimum feasible levels of supply are achieved in a particular region. Several extractor communities in the Chinantla region of Oaxaca, for example, were left without a market when an independent intermediary relocated.

Local consolidators, when they exist, take varied forms. One development professional described a case in a community in the Chinantla region of Oaxaca where one community member stored all of the palm fronds extracted by others throughout the week until the arrival of the intermediary (Santos, personal communication). In Uaxactún, Guatemala, a community-managed storage facility was built to store palms brought in from the forest by pickup truck before they were cargo trucked to nearby Santa Elena. In these and most other cases, local actors consolidate extensive palm extraction so that the relatively capital intensive modes of transportation may achieve economies of scale during periodic visits to the community.

Consolidators and exporters operating at the regional and national levels comprise the most diverse general category of actors in the supply chain. This diversity can be attributed to the fact that the value chain may take varied form between the harvester/grower and the importer, depending on numerous factors. Perhaps the largest national consolidators in Mexico and Guatemala are Continental and Plantas Arco Iris, respectively.

International buyers of palms fronds are limited and the market at this level could justly be described as a monopsony. In the United States, one buyer – Continental Floral Greens (CFG) of Texas – reputedly imports the vast majority of stems. Smaller importers include W.F.R., Inc. and Simpson's

Greens, both located in Florida. CFG and W.F.R. (formerly Jewel) are the original importers of *Chamaedorea* palm fronds described earlier in this chapter.

Dimensions of the Integrated Palm Market

The Conventional Market(s)

Palm fronds are important in the floral industry, yet are not typically components of a flower shop's retail assortment. Florists employ palms and other greens in retail floral arrangements either as decorative material, filler, or to provide structural support (Current and Wilsey, 2002). Typically, flower shop retail customers request floral arrangements based upon one or a few predominant flowers, whereas additional flowers and filler greens are added at the discretion of the florist. In the floral industry; therefore, the end consumer of *Chamaedorea* palms is effectively the retail florist, rather than the flower shop patron.

Certain denominations of Christian churches comprise another source of demand for *Chamaedorea* palms (CEC, 2002). Palms, which represent victory, are used in Palm Sunday celebrations. In contrast to the flower shop scenario, churches purchase the actual palm fronds – by stem or bunch, in accordance with the congregation and the specific use in the celebration (i.e., structural décor or distribution to parishioners). Palm Sunday palms can be purchased through retail florists and wholesalers, but are also available through businesses catering specifically to religious organizations. Church-driven consumption may double or treble weekly demand, relative to typical weeks during the year, but the increase is limited to the weeks preceding Palm Sunday. The notion of environmentally and/or socially certified palm production and distribution has the greatest traction among church consumers (Current, *et al.*, 2003).

It is difficult to estimate the respective proportions of *Chamaedorea* import volume attributable to floral industry and church use. Floral wholesalers and retailers serve as intermediaries for both the floral and church markets, so floral industry data may overestimate use in floral arrangements. Finally, cross-denominational estimates of church palm use almost certainly include a wide variety of palm species including, but not limited to, *Chamaedorea* varieties.

Market Dimensions and Trends

Commercial import of *Chamaedorea* palms began around 1950. Import and sales volumes increased in subsequent years before peaking – once in the late 1970s, then again in the late 1980s. Annual import data synthesized from several sources (Johnson, 1999; CEC, 2002; AMS, 2007) offer a picture of the overall trend in palm imports to the United States since the early 1970s (Figure 3).

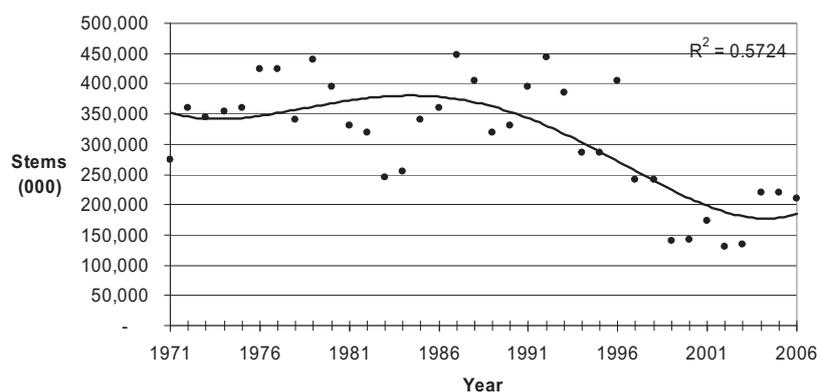


Figure 3. Total annual palm imports to the United States, 1971-2007

Although annual imports have been volatile throughout, they reached an absolute peak of nearly 450 million stems in the mid 1980s before beginning an erratic, downward trend. Only in recent years has the downward trend that began in the early 1990s slowed, or perhaps stabilized, with imports rebounding from fewer than 150 million stems in the early part of the current decade to about 225 million annually.

Palm imports vary notably by season. For most species, demand doubles or triples with respect to the week-to-week baseline during the weeks preceding Easter. Seasonal peaks vary by species; however,

and one of the most popular overall sellers – *C.oblongata* – typically receives only a 20-30 percent bump in demand during the Easter season. This point alludes to the importance of recognizing that several *Chamaedorea* palm species, each with different attributes, form a “commercial composite.”

Product Heterogeneity

Latin Greens and Commodore are the two most common trade names used in the United States to generically reference all commercial varieties of *Chamaedorea* foliage. Because the commercial classification is comprised of numerous species, or products, it is important to recognize that aggregate annual and seasonal export, import, and sales figures mask differences in species-specific values. *C.oblongata* (Wide), *C.elegans* (Jumbo), *C.quetzalteca* (Giant or Chiapas), and *C.ernesti-agusti* (Fishtail) are the predominant species, in terms of unit volume, used for commercial foliage (CEC, 2002; Reyes Rodas and Wilshusen, 2006). Species level data are often unavailable or unreliable (Camarena M, 2005). Significant demand volume differences as well as regional availability of varieties may prove to be important considerations in determining location-specific production systems and market interventions, such as certification.

Eco-Palms: an Emerging Market

The most noteworthy emergent trend in the palm market is the recent establishment and rapid growth of the market for “Eco-Palms” (Box 1) amongst church consumers. In 2001, the North American Commission for Environmental Cooperation (CEC) commissioned a study of the overall market for *Chamaedorea* palms in North America and Europe (CEC, 2002; Current and Wilsey, 2002). This market study identified a potential opportunity for developing a market for sustainably extracted palms oriented toward church consumers. This potential market niche was further explored in a subsequent study (Current, *et al.*, 2003) and, in 2005, a pilot sale of “Eco-Palms” was organized and administered by the Center for Integrated Agricultural and Natural Resources Management (CINRAM) at the University of Minnesota. In 2006, the pilot was expanded to a regional sale centered on the Minneapolis-Saint Paul urban area. The regional effort sold 80,000 stems, up from 5,000 in 2005 (Lacey, 2007). In 2006, participating churches paid US\$ 0.22 per stem for certified palms – generating a premium of about 5 cents *per stem* for harvesters. Fueled by the success of the 2006 regional effort, the sale went national in 2007 with sales of around 364,000 stems.

Box 1. Certifying “Eco-Palms” for Conservation and Livelihood Benefits

Since 2001, the Center for Integrated Natural Resources and Agricultural Management (CINRAM) at the University of Minnesota has been working with the North American Commission for Environmental Cooperation (CEC) and other partners including Rainforest Alliance in Guatemala and PRONATURA, an environmental NGO, in Mexico to produce palms which are sustainably harvested and which provide greater income to harvesting communities as a way to promote environmental conservation and improved livelihoods for the gathering communities. Sustainably harvested palms are sold to Christian congregations in the US for Palm Sunday providing an additional \$0.05 premium payment per stem following Palm Sunday in addition to the \$0.01-0.02 that the communities normally receive year-round for the palms. The premium payment has been used for scholarships, paying teachers and providing social services to harvesters. Two communities in Guatemala are currently in the process of qualifying for FSC certification for palm harvest under the Rainforest Alliances’ Smartwood Program, with plans for additional communities to follow.

Source: CINRAM, University of Minnesota

Eco-Palm sales have generated a buzz among project promoters and in the broader *Chamaedorea* community. Yet, it is important to contextualize these sales figures by juxtaposing them against the conventional palm market. Plotting *imports* of conventional palms and *sales* of Eco-Palms (both logarithmically transformed and the latter lagged one year) demonstrates two important points (Figure 4).

One is that annual sales of eco-palms have grown exponentially. This pattern has justifiably fueled optimism. This optimism is tempered by a second point: the volume of eco-palms remains several orders of magnitude lower than the volume of conventionally produced stems. In 2006, just over 200 million conventional stems came into the United States, of which the roughly 364,000 stems of eco-palms sold in 2007 would have represented about 0.2 percent of the market.

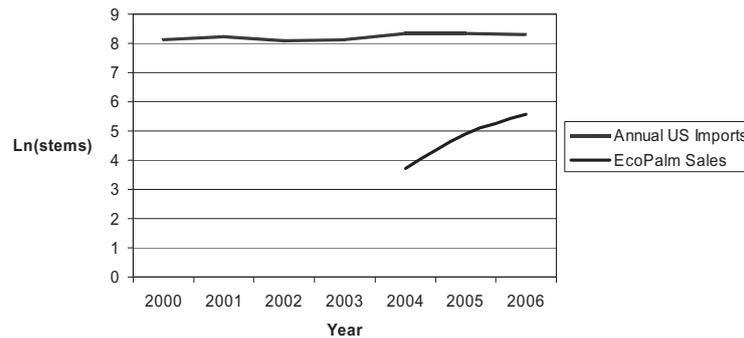


Figure 4. Total annual imports to the U.S. and sales (1-yr lag) of Eco-Palms (AMS, 2007; Lacey, 2007)

Discussion and Conclusions

We set out to better understand the likely obstacles to palm certification by focusing on the broader palm value chain and market; hypothesizing that the feasibility of certified palms would depend in part upon the attributes of certified supply and demand relative to the supply and demand for conventional product in the global market. Three important observations emerged from this analysis.

First, the seasonality of certified demand suggests that extractors will likely face challenges associated with adjusting their year-round activities in order to accrue benefits for the Easter palm season. In most regions, communities extract palms throughout the year. Extractors' willingness to pursue certification for seasonal or other markets will likely depend on three factors. First, the market price and the associated premium paid to the extractors of certified palms will certainly be a factor into in local assessment of the benefits of certification. Ultimately, price premiums will need to be contextualized via separate analysis of extractor livelihoods, another element of this project's multi-scale analysis. Second, certification confers benefits to extractors not only through market benefits, but also through learning and signaling mechanisms (Rickenbach and Overdeest, 2006). The extent to which extractors a) recognize and b) value these benefits will play an important role in their willingness to certify. Third, as state institutions increasingly focus on sustainability guidelines for the harvest of forest products, the extent to which certification facilitates state authorization for palm extraction might increase producer willingness to subject their extraction to certification standards, even if market benefits accrue only seasonally.

Second, new certified producers face barriers to entry that stem from a mature palm market and an oligarchic value chain comprised of a few dominant actors and regions; most already having established relationships with other actors and significant history in palm commercialization. These barriers will likely be more imposing for new producers interested in capitalizing on a growing certified market. The transaction costs for intermediaries and buyers of building relationships with new suppliers could represent a significant obstacle, considering the often under-developed socio-political infrastructure in extractor communities. The challenge to new producers becomes even more imposing if, as described above, existing extractors determine, for one or a combination of reasons, that certification makes sense. The case of the certified MBR community forest concessions and the current push for certification by international actors such as Rainforest Alliance suggest that such a conversion scenario is worthy of serious consideration.

Third and finally, economies of scale represent a significant obstacle for actors throughout the value chain. Present levels of demand make segregation of eco-palms from conventional palms in the supply chain infeasible over the long term (Everett, personal communication). This assessment by one of the largest U.S. palm importers sheds light on the present gulf between annual demand for 364,000 eco-palm fronds and the over 200 million fronds annually imported to the U.S. We are reminded of Overdeest's (2004) observation that strategies for the certification of high-standard products and processes are often limited by the difficulty of constructing viable markets. For palms, the viability of a certified market appears to be presently limited by nascent consumer demand, manifested in insufficient economies of scale throughout the central links in the value chain.

We conclude that a combination of *quality-driven procurement* of palm fronds manifested in part through *vertical integration* of early-stage processing might represent an *intermediate step* in the

development of markets for palms, and perhaps other NTFP certified for sustainability. Early success in Guatemala's MBR concessions highlights the value of including existing industry quality standards in sustainable management certification schemes. Although the forest concessions in the MBR are commercializing palms that are certified for sustainable management through an addendum to FSC forest management certification, they are being purchased for their quality attributes. Palm fronds meeting quality as well as other social/environmental standards thus provide a possible solution to the challenges presented above. These palms can be sold at current prices in the conventional market without any special consideration. However, with proper handling (i.e. segregation) throughout the supply chain, they can be sold for a premium as certified palms to churches and other interested consumers.

A quality emphasis also represents an opportunity for individual extractors and their communities to assume increased responsibility for early-stage palm processing; in effect, vertically integrating these early links in the palm value chain. Value-added quality processing may tip the balance in favor of certification by allowing communities to capture more of the product's market value. The recent direct-sale experience of the forest concessions in the MBR provides some early evidence that such a model can be successful. A need remains for analysis at the scale of the extractor livelihood system; one of the objectives of the broader, multi-scale analysis described in the introduction.

Combining product standards and process standards represents a bundling of attributes that when considered in isolation may be insufficient to support commercial success for actors throughout the value chain. Increased vertical integration of palm processing at the extractor level helps to ensure that more of the benefits to certification will accrue to harvester communities. Thus, the coupling of quality standards and vertical integration may serve as an intermediate step in the development of a certified palm market, during a market development phase that might otherwise preclude the commercialization of process-only certified palms. Over time, as the market for certified palms matures and approaches anticipated levels of success and scale, product quality and process standards could be unbundled, although we feel it is unlikely that this would occur.

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