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“Sampling People That Don’t Stand Still: Targeting Traders as Key Elements of Value Chain Function and Performance, and How They Can Be Sampled”

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The teak (*Tectona grandis* L.f.) leaves marketing chain in southern Benin: part time trade, contribution to livelihoods and environmental sustainability

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Abstract

The marketing and the valorisation of teak (*Tectona grandis* L.f.) leaves were studied in southern Benin, in order to generate useful information to capture the livelihoods improvement potential of this non wood forest product (NTFP). 76 traders and 44 consumers of teak leaves were interviewed in nine markets purposely selected based on their functions in the marketing system. Traders provided information on their functions in the marketing system, the costs borne, and their revenues. In the consumers' survey, respondents provided data on the consumption forms of teak leaves. The marketing channel consisted of a network of markets, with specialisation per functions in respect to their geographical pattern: rural - peri-urban - urban gradient. Rural women were the main stakeholders engaged in the trade of teak leaves. Three categories of traders were identified, namely collectors wholesalers-retailers, collectors-retailers, and retailers. The monthly net revenue was XOF 4,659–15,927 (USD 9.3–31.9) during the rainy season and XOF 6,621–21,655 (USD 13.2–43.3) during the dry season. These revenues were used to meet household's needs, especially food supply, hence contributing to food security. Regarding the consumption, teak leaves were used mainly for packaging food products. As a substitute to polyethylene bags in food packaging, teak leaves offer a great potential to tackle environmental pollution in southern Benin.

Keywords: marketing, NTFP, teak leaves, income, food security.

Introduction

Poverty alleviation, especially in rural areas, remains a major policy matter in Sub-Saharan African countries (Dorward et al., 2004). The potential for farmers to generate income from their activities depends widely on their access to market (Dorward et al., 2004; Jama and Pizarro, 2008). Marketing activities contribute to create wealth through the addition of value to the product (Aoudji et al., 2011; Goossens, 1998). Therefore, analyses of marketing systems are essential to support policy interventions (Goossens, 1998; Shepherd, 2007).

Given the importance of agriculture in the economy of Sub-Saharan African countries (World Bank, 2012), this sector concentrates the attention of policy makers in their strategy to support the access to market for smallholder farmers. However, besides agriculture, rural people are engaged in other activities. So far, alternative livelihoods means such as the valorisation of non timber forest products (NTFP) receive little attention from policy makers, hence the ignorance of their potential (Parratt, 1996). NTFP refers to biological materials other than timber which are extracted from forests for human (Beer de and Mcdermott, 1989). It has been shown that non timber forest products generate income and play a critical role in the livelihoods of rural communities (Avocèvou-Ayisso et al., 2009; Jensen, 2009; Uprety et al., 2010; Vodouhê et al., 2008).

Researches highlighting the social and economic importance of non timber forest products are necessary to raise the awareness of policy makers on the importance of these products. Therefore, despite evidence from previous studies (Belcher et al., 2005; Ndangalasi et al., 2007; Quang and Anh, 2006; Uprety et al., 2010; Zoro Bi and Kouakou, 2004), the question “How well does the marketing of non timber forest products supports livelihoods?” remains of interest. The objective of this paper is to enlighten policy makers about the importance of non timber forest products, based on the case study of the marketing of teak leaves in southern Benin (Figure 1). Teak is a valuable forest species often praised for its timber (Aoudji et al., 2011; Aoudji et al., 2012; Demenois et al., 2005; Pandey and Brown, 2000; Purnomo et al., 2009).

Practically, the study focuses on traders who play a critical role in production consumption-to-production chains through their marketing functions (Goossens, 1998; Shepherd, 2007). A typology of traders was performed, based on their functions in the marketing channel, so as to understand their working strategy. Besides, the income generated by marketing activities was assessed, as an indicator of the contribution to livelihoods.

This paper progresses as follows. The next section deals with the research methods. The results and the discussion are presented in sections 3 and 4, respectively. In the last section, we summarise the main findings with the related policy recommendations.



Figure 1. A young smallholder teak plantation.

2. Methods

2.1. Main features of the study region

The study was carried out in the Atlantique and Littoral departments, in southern Benin (Figure 2) where teak plantations have been installed by the government and smallholder farmers. That region covers 3312 square kilometres, with an estimate of 2095466 residents in 2013 (INSAE, 2008). The region is characterised by a sub-equatorial climate; with two rainy seasons (March to July and September to October) alternating with two dry seasons. Mean annual rainfall and mean annual temperature are 1100 mm and 27 °C, respectively. The relief consists predominantly of plateaus. Soils are composed of ferrallitic soils, black cotton soils, hydromorphic soils, and rough mineral soil (coastal areas). Local economy encompasses farming, trade and craft industries. Maize and cassava as main staple food, and oil palm plantations are key components of rural livelihoods. Smallholder forestry is developed; teak (*Tectona grandis* L.f.) being the most widely planted species, with acacia (*Acacia auriculiformis* Cunn. ex Benth.) to a lesser extent. The forest economy also includes logging, forest product trade and processing, with numerous small sawmills and craft woodworkers operating throughout the region.

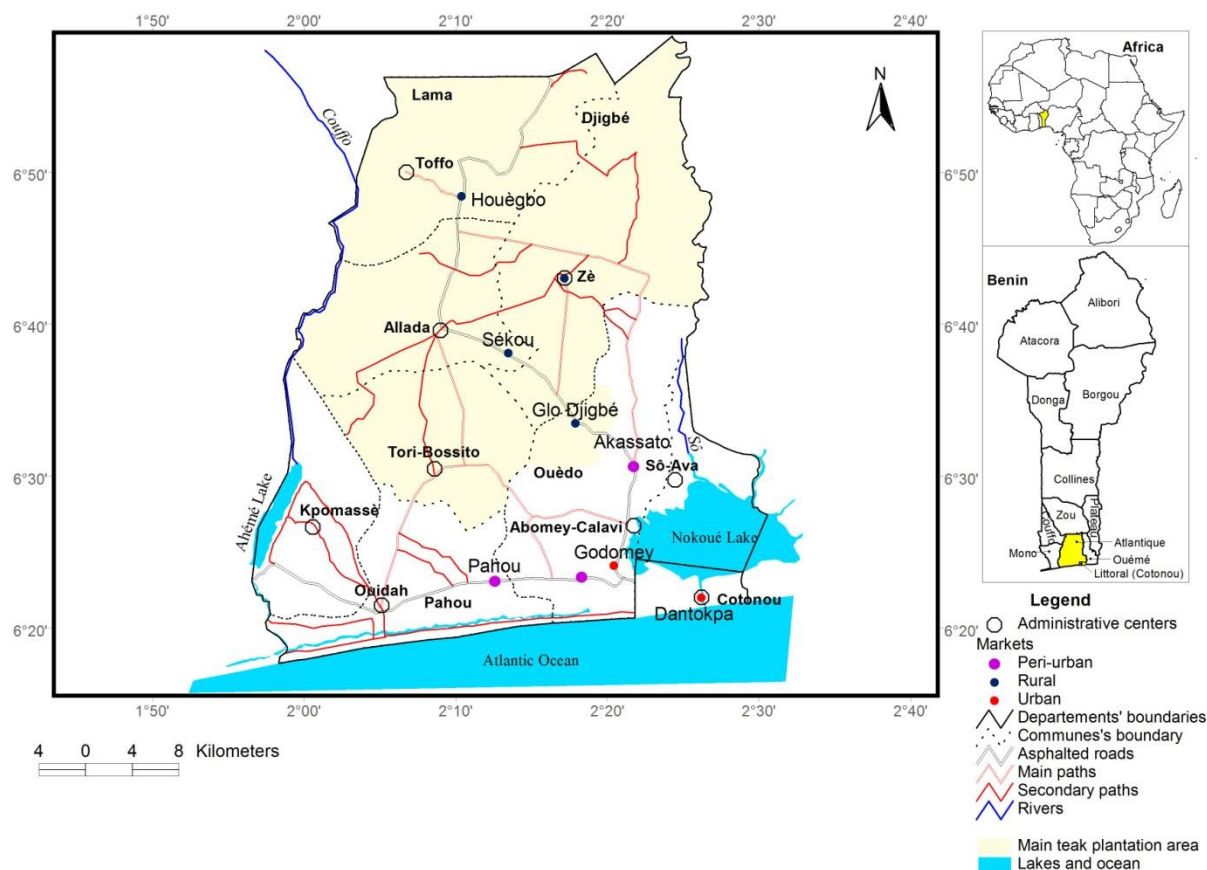


Figure 2. Map of the study region.

2.2. Sampling and data collection

The main part of the study was performed in markets where traders and consumers of teak leaves were surveyed. These markets were purposively sampled based on their functions in the marketing system of teak leaves. Three types of markets were identified: rural, peri-urban, and urban markets. Rural markets are connected to rural areas where teak plantations are developed while urban markets are located in cities, i.e., consumption centres more distant to production areas. Peri-urban markets are connected to transitional areas between rural and urban regions (Jaquinta and Drescher, 2000).

The first stage consisted in identifying the main production areas in the Atlantique department, namely the communes of Zè, Toffo, Tori-Bossito, Allada, and Abomey-Calavi. The rural/peri-ruban market connected to each production area was selected so as to understand the organisation of activities at the local level. The rural markets selected were as follows: Houègbo in the commune of Toffo; Sékou in the commune of Allada; Zè in the commune of Zè; and Glo-Djigbé in the commune of Abomey-Calavi. The latter market is also connected to the production zone of Tori-Bossito. The selected peri-urban markets included Pahou in the commune of Ouidah; Akassato, and Cococodji in the commune of Abomey-Calavi. Regarding urban areas of consumption, the following urban markets were selected: Godomey in the commune of Abomey-Calavi (Atlantique department), and Dantokpa market in Cotonou (Figure 2). To summarise, nine markets were selected including four rural markets, three peri-urban markets, and two urban markets (Figure 2).

A survey was carried out across traders and consumers in sampled markets from November to December 2011. That period was selected because it corresponds to the beginning of the dry

season where the teak leaves business is more flourishing (findings from exploratory survey). Each selected market was visited two consecutive market days. All the traders present in the market were interviewed. Likewise, all consumers met during their supply in these two market days were interviewed. This approach enabled us to interview a total of 120 persons including 76 traders and 44 consumers of teak leaves.

Data collection was based on face-to-face interviews. The following data were collected from traders: the socio-demographic characteristics, the functions performed in the marketing channel (wholesales, retails) the organisation of their activities (collection, transportation, type of labour, etc.), the price of teak leaves at different levels in the marketing channel, the quantities of goods commercialised, the interactions with partners, the costs and revenues related to their business, and the number of market days per month. Data were also collected about the costs and income related to their activities. Consumers provided information about the consumption forms of teak leaves and the substitute products used. Besides traders and consumers, additional data were collected from other stakeholders in the market and plantation regions so as to have a comprehensive understanding of the functioning of the marketing channel. This was done by combining semi-structured interviews and focus group discussions.

2.3. Data processing and results compilation

The first stage consisted in making a compilation of all stakeholders involved in the teak leaves marketing channel. Then focus was put on traders through a typology based on their marketing functions and other functions performed in the channel. Traders were characterised based on the average quantity of products sold per market day. Second, a synthesis was done on product flow, units and price settings in the chain. Last, the revenues from the teak leaves marketing was determined by considering the net margin per market day and the monthly income generated by the activity.

The net margin was determined as follows: $NM=SR-TC$ (Lebailly et al., 2000); where SR is the sales revenues, and TC is the total cost. The calculation of the monthly income was done by multiplying the net margin by the number of market days reported by traders. Statistical comparisons were carried out by combining Student's t test and the analysis of variance (Glèlè-Kakaï and Kokodé, 2004).

3. Results

3.1. Agents and functions

Five stakeholders were involved in the teak leaves marketing channel in southern Benin: owners of teak plantations, traders, transporters, consumers, and the communes. Teak planters, traders and consumers were direct agents who had the ownership of the product at a given stage of the chain (Figure 3) while transporters and the communes were indirect agents involved in the functioning of the marketing system.

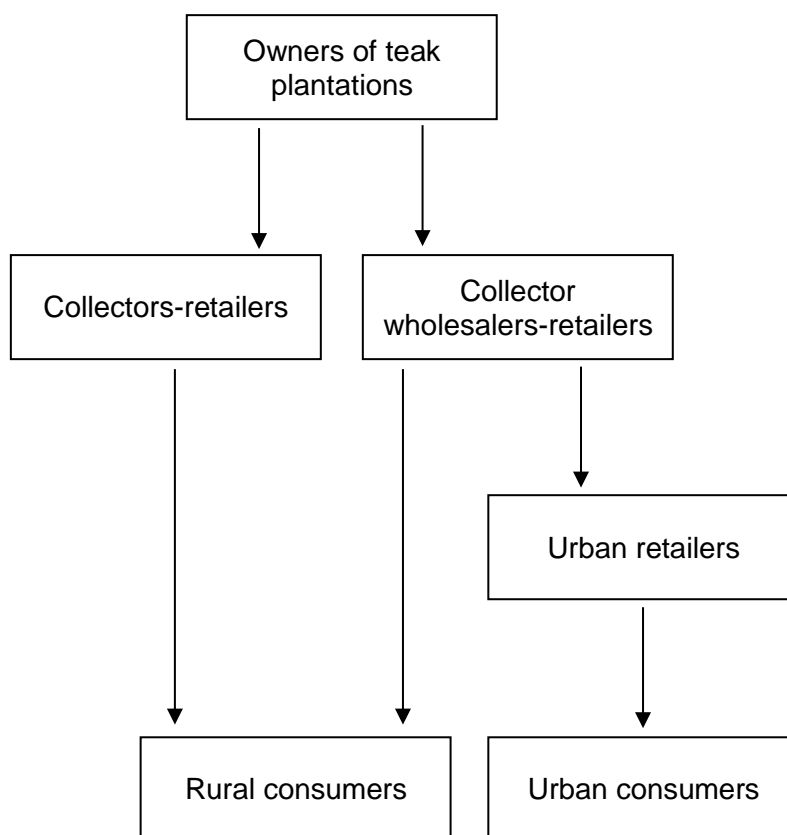


Figure 3. Map of the teak leaves marketing channel in southern Benin.

Owners of teak plantations

Plantation owners included smallholder farmers and the “Office National du Bois (ONAB)”, the public company in charge of the management of State’s teak plantations. Timber is the principal objective targeted through the settlement of teak plantations. Therefore, the exploitation of teak leaves is not a purpose for plantation owners.

Traders

Traders were the key stakeholders in the teak leaves marketing channel. They were women aged between 25 and 60 years old, and generally illiterate (96% of respondents). The marketing of teak leaves was generally a secondary activity for traders (70% of respondents) who were engaged in other activities (farming, crafts, marketing of medicinal plants, and marketing of agricultural products).

There were three categories of traders, based on the marketing functions performed (wholesale, retail) and their involvement in the harvest of teak leaves: collectors-retailers, collectors wholesalers-retailers, and retailers (Figure 3). In this paper, wholesale is used in reference to transactions where the buyer is another trader while retail applies to transactions between traders and end-consumers.

“Collectors-retailers” refers to agents engaged in retail trade by selling directly their products to rural consumers (Figure 3) in rural markets, after handling the harvest of teak leaves themselves. Besides retail sales to rural consumers, the “collectors wholesalers-retailers” were also engaged in wholesale of teak leaves. In that case, the customers were the retailers who in turn sold the product to end consumers in the urban markets (Figure 3). The latter category of was not involved in the harvest of teak leaves.

The collectors-retailers used to operate in rural markets (Houègbo, Sékou, and Zè), while the collectors wholesalers-retailers used to operate in peri-urban markets (Akassato, Cococodji, and Pahou). Besides peri-urban markets, collectors wholesalers-retailers were also operating in the rural market of Glo-Djigbé (Figure 2). The retailers used to operate in urban markets (Godomey and Cotonou).

The average quantity of teak leaves commercialised by traders per market day ranged between 44 and 83 Kg, and 47 and 95 Kg, during the rainy season and the dry season, respectively (Table 1). The figures of the dry season were higher, as compared to the rainy season whichever the type of trader considered (Table 1); but the differences were not significant (Student's *t* test; all $p > 0.05$). The quantity of leaves commercialised per market day in the retail market varied consistently according to the type of traders whichever the season considered (Table 1). Urban retailers were selling a higher quantity of product, compared to the rural traders (collectors-retailers and collectors wholesalers-retailers). That difference stems from the fact that urban retailers were operating in a larger market. Their strategy consisted in buying teak leaves from several “collectors wholesalers-retailers” to have large quantities of products.

Table 1. Quantity of teak leaves commercialised by traders per market day in different seasons.

Type of trader	Quantity of teak leaves commercialised (Kg)	
	Rainy season	Dry season
Collectors retailers	44 a*	47 a
Collector wholesalers-retailers	53 a	61 a
Retailers	83 b	95 b

*: Figures followed by different letters in the same column are significantly different at 5% level.

Consumers

The consumers of teak leaves were basically women, foods sellers. Food packaging was by far the main consumption form of teak leaves. A diversified range of food was packaged with teak leaves: “akassa”, (maize paste), bean cake, wheat paste, smoked fish, “mustard”¹, cassava cake, flat cake of groundnut, soya bean cheese, leafy vegetable, beef meat, etc. (Figure 4).

Besides food, teak leaves were also used for packaging other products (e.g., soap), and for therapeutic purposes. The therapeutic uses of teak leaves were less spread: only 11% of respondents reported the use of teak leaves for medicinal purposes. According to those users, the red potion obtained by boiling the young leaves serves to treat anaemia².

¹ Mustar refers to a seasoning made from the seeds of the African locust bean (*Parkia biglobosa* (Jacq.) R. Br. ex G. Don)

² Recipe: The young leaves freshly harvested are boiled, in mixture with other medicinal plants.



Figure 4. Maize paste (left) and mustard (right) packaged with teak leaves.

Transporters

Transporters were indirect agents not specialised in the teak leaves business, but they merely intervened in the transfer of the products from one place to another in the marketing channel. Small passenger cars were used to transport teak leaves from peri-urban markets to urban markets (Figure 5), while bikes and motorbikes were involved in the transfer of the product between teak plantations and the rural and peri-urban markets.



Figure 5. Passenger cars transporting teak leaves from peri-urban markets to urban markets.

Communes

The communes were involved in the functioning of the marketing channel as the regulators of public markets where transactions take place (Figure 6). In compensation, they collect levies from all traders operating in the markets. The amounts were not proportional to sales volumes, and varied across the municipalities, from XOF 50 to XOF 100 per market day.



Figure 6. Transactions of teak leaves bunches in the market.

3.2. Products flow and transactions across the region

The harvest of teak leaves, the starting point of the marketing channel was handled by traders. This product was collected from smallholder teak plantations and State's teak plantations. Regarding smallholder plantations, the product was harvested by women in the plantation of their relatives (husband, father, or father-in-law). Those who had no relatives owning teak plantations had to source the leaves from a third person's plantation. This is often done without informing plantations holders; but sometimes, a small gift of XOF 500-1000 (USD 1-2) is granted to the plantation holders. These amounts were not proportional to the quantities harvested. In the case of State's teak plantations managed by the "Office National du Bois", teak leaves (non-timber forest product) are granted free to women from neighbouring villages, as part of participatory forest management clauses.

In the study region, the flow of teak leaves occurred at two levels: local consumption in rural areas and the transfer toward the urban centres. In rural markets, local consumers used to purchase teak leaves from the collectors-retailers and the collectors wholesalers-retailers. Product flow to urban markets was from plantation areas toward the cities of Abomey-Calavi, Cotonou and Ouidah, via peri-urban markets (Figure 2).

Bunches were used as units in wholesales transactions between rural collectors wholesalers-retailers and urban retailers (Figure 6). The volume of bunches varied greatly, resulting in heterogeneity in the price. They weighed on average 27.5 kg with a standard deviation of 12.0 kg. In peri-urban markets, the collectors wholesalers-retailers applied a unit price of XOF 900-1000 (USD 1.8-2.0) per bunch during the study period. Likewise, a diversified range of units was used in retail transactions. These varied across markets, but variations were also found in a given market³. The variety of units encountered included small bunches of various sizes as well as leaves counting (Figure 7). The retail price ranged between XOF 150 and 400 (USD 0.3-0.8), according to bunches volume.

³ Variation in units was so marked that it did not make sense to report an average weight here.



Figure 7. Diversity of retail units in the marketing system.

3.3. Revenues from teak leaves marketing

The net margin per market day varied between XOF 777 and XOF 2,655 (USD 1.6-5.3) during the rainy season, and between XOF 1,104 and XOF 3,609 (USD 2.2-7.2) during the dry season (Tables 2). The monthly revenue, ranged between XOF 4,659 and XOF 15,927 (USD 9.3-31.9) during the rainy season and between XOF 6,621 and XOF 21,655 (USD 13.2-43.3) during the dry season (Table 3). The net margin per market day varied across trader types (Table 2). Likewise, the monthly revenue varied consistently across trader types whichever the season considered (Table 3). Urban retailers' revenue was higher, compared to rural traders' (collectors-retailers, and collectors wholesalers-retailers). Moreover, revenues were generally higher in the dry season, compared to the rainy season (Tables 2 and 3), even though these differences were not significant (Student's *t* test, all $p > 0.05$).

Table 2. Traders' net margin per market day in different seasons (XOF).

Types of trader	Net revenue per market day	
	Rainy season	Dry season
Collector retailers	777 a*	1104 a
Collector retailers-wholesalers	850 a	1340 a
Retailers	2655 b	3609 b

* Data followed by the same letter on a given column are not significantly different at 5% level (ANOVA, Least Significant Difference).

Table 3. Traders' monthly revenue in different seasons (XOF).

Types of trader	Monthly net revenue	
	Rainy season	Rainy season
Collector retailers	4659 a*	6621 a
Collector retailers-wholesalers	5100 a	8040 a
Retailers	15927 b	21655 b

* Data followed by the same letter on a given column are not significantly different at 5% level (ANOVA, Least Significant Difference).

4. Discussion

4.1. Characteristics of the marketing system, and implication for trader sampling

The marketing system of teak leaves in southern Benin was relatively short, with two major stakeholder groups: rural and peri-urban traders on one side – who were at the beginning of the channel by handling the function of product harvest – and urban retailers on the other side. This shortness of the marketing channel is consistent with the absence of any significant transformation and value-addition from harvest through delivery to end consumers. The

shortness of the channels seems to be a frequent pattern of local markets of non timber forest products channels (Shackleton et al., 2007). Similar examples in Benin include the medicinal plant marketing channel (Vodouhê et al., 2008), and the *Pentadesma butyracea* almond marketing channel (Avocèvou-Ayisso et al., 2009). In the particular case of the teak leaves marketing in southern Benin, the perishability of the product justifies the quick transfer from rural region to end-consumers, hence the small number of middlemen.

The teak leaves marketing channel in southern Benin operated through a network of markets with specialisation per functions in respect to their geographical pattern: rural - peri-urban - urban gradient. Rural markets were specialised in retail trade to rural consumers; peri-urban markets combined retailing to consumers and wholesale transactions between traders. Urban markets were specialised in retail trade to urban consumers. The presence of collectors wholesalers-retailers in the rural market of Glo-Djigbé highlights ongoing changes in this areas which is being transformed from rural to peri-urban. The predominant location of wholesale transactions in peri-urban markets stems from the fact that these markets are closer to urban end markets and are deserved by good roads. Given that transportation is a key component of marketing costs which depends on road quality and distance (Shepherd, 2007), the choice of these markets by urban retailers for consignment sourcing enabled them to minimize transport costs, thanks to proximity and good road conditions.

The specialisation of the market per function, with respect to geographical area has motivated the use of purposive sampling in their selection. Also regarding sampling, the interview of all traders operating in a given market was facilitated by the fact that teak leaves traders are often concentrated in a given place in the market (see figure 6). Traders of commodities such as non timber forest products and fruits often occupy a same market place in southern Benin. The approach used is similar to cluster sampling in which data collection would encompass all traders operating in the market (Giannelloni and Vernet, 2001). However, despite the visit of each site in two consecutive market days, the study failed to assess the exact number of traders and other stakeholders concerned the marketing channel. This is due to the occasional nature of the teak leaves business for most traders. However, this did not affect the validity of this study regarding the objective which was to provide socio-economic data in order to raise decision makers' awareness on the potential of this activity. The cohabitation of traders in a given market seems to have a positive effect in their cooperation during the survey (collective confidence).

The heterogeneity of units (bunch size) in this marketing channel represents a common feature with most rural products channels in Sub-Saharan Africa (see e.g., Lutz, 1994; Fafchamps and Gabre-Madhin, 2006). However, this does seem to be an impediment for consumers, owing to the fact that price bargaining occurs in all transactions to reach an agreement between both parties. Overall customers had the perception that the current price setting is affordable, compared to polyethylene bags, the substitute product.

4.2. Importance of women in the settlement of the marketing channel

The marketing system was dominated by women who performed all the marketing functions. This result is consistent with previous studies showing the predominance of women in the marketing channel of non-timber forest products in Benin. These include the marketing channel of *Pentadesma butyracea* in central Benin (Avocèvou-Ayisso et al., 2009) and the marketing channel of medicinal plants in southern Benin (Vodouhê et al., 2008). In the latter case, the percentage of women encountered in the marketing channel was as high as 97% (Vodouhê et al., 2008). Likewise, in the marketing system of agricultural products in Benin and Malawi, small traders included predominantly women (Fafchamps and Gabre-Madhin,

2006). The predominance of women in NTFP business originates from the low capital requirement of these marketing activities. In the case of the teak leaves marketing system, a capital of XOF 1000 (USD 2) is enough to begin the activity. The predominance of women among small trader also highlights the constraint of capital to engage in larger trade activities. Interestingly, teak leaves business is a part-time activity for women who, depending on other opportunities, could enter and exit freely from the activity.

Teak plantation holders, especially smallholder farmers, were not playing a significant role in the marketing system despite their primary ownership on the product. The low involvement of plantation holders in the marketing channel of teak leaves stems from the fact that timber production is the key motivation underlying the plantation settlement; hence their low interest in the valorisation of non timber forest products such as leaves. However plantation holders complained sometimes about the negative effect of leaf harvest on timber quality.

4.3. Potential for livelihood improvement and environmental sustainability

The trade of teak leaves appears as a mean to diversify livelihoods, and improve household's food security. Despite the small amount of revenue, women were very happy because this helps them to address household needs (e.g., the purchase of foods for household needs). The interest is that teak leaves business is a secondary activity for women who also secured income from other activities in off-market days.

The study showed a high interest of food sellers in the use of teak leaves for packaging their products. Teak leaves are also used for food packaging in other regions in Africa, e.g., Cote d'Ivoire (Maldonado and Louppe, 1999). Consumers' interest in teak leaves is supported by its easy availability from State's plantation as well as smallholder plantations. Therefore, teak leaves have become a substitute to native species which are now very scarce because of the high deforestation rate of in Benin (FAO, 2011).

The use of teak leaves in southern Benin for food packaging offers a huge opportunity for tackling, at least partly, environmental pollution. This is because teak leaf is the substitute of polyethylene bags also used for packaging foods, e.g., akassa" (maize paste). Contrary to teak leaves, polyethylene bags are not biodegradable and are source of environmental pollution. Therefore, the marketing of teak leaves could be connected to the region's green economy. Policy makers could take advantage of this opportunity by carrying out advertisement campaigns showing the interests of teak leaves and the dangers represented by polyethylene bags. This could in turn increase market opportunities for rural women and other stakeholders operating in the teak leaves marketing channel. Therefore, the lack of specialisation among traders (part-time trade) could change in the future with the increase of the demand for teak leaves, especially in urban region.

5. Conclusions

The focal target of this study was to analyse the marketing system of teak leaves in southern Benin, so as to highlight the potential of this product to support livelihoods. This was done by combining, mainly a typology of traders, and the assessment of the income generated by their business.

The marketing channel consisted of a network of markets, with specialisation per functions in respect to their geographical pattern: rural - peri-urban - urban gradient. Rural markets were specialised in retail trade to rural consumers; peri-urban markets combined retailing to consumers and wholesale transactions between traders. Urban markets were specialised in retail trade to urban consumers.

The marketing system was dominated by women who controlled the main functions. Three categories of traders were encountered, based on their marketing functions and their involvement in product harvest: collectors-retailers, collectors-wholesalers-retailers, and retailers. The channel was relatively short, with two major stakeholder groups: rural and peri-urban traders on one side – who were at the beginning of the channel by handling the function of product harvest – and urban retailers on the other side. Besides traders and the consumers, plantation owners, transporters and the communes were also involved in marketing system.

The marketing of teak leaves was a part time activity (secondary activity) for traders, all of whom were engaged in other activities (farming, crafts, agricultural product trade, etc.). However, this activity generates substantial income, and contributes to strengthening household food security. Advertisement campaign could help to increase teak leaves demand for food packaging, to the detriment of polyethylene bags. This represents an opportunity for policy makers to increase the income of rural women and tackle environmental pollution by polyethylene bags in southern Benin.

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