

Identification of main Non-Timber Forest Products and related stakeholders in its value chain in the Gribe village of southeastern Cameroon

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Abstract

Although viewed as low-power income product, trade in Non-Timber Forest Products (NTFPs) in rural communities represent a major source of income for local residents who depend on them for revenue and subsistence. This study is based on monitoring and quantitative recording of each NTFP gathering by villagers. The results revealed that the main products collected include: *Irvingia gabonensis*, *Aframomum* spp., *Pentaclethra macrophylla*; *Ricinodendron heudelotii*, and *Afrostryrax lepidophyllus*. The main stakeholders in NTFPs value chain were identified as: collectors, local traders, semi-distributors, intermediaries, and wholesalers (Nigerian and Malian Settled in the village). The prices of these NTFPs fluctuate between 0.09 – 0.67 USD per kilogram (kg) at village level. However, these products are generally resold between 0.67 – 4.44 USD per kg in urban market.

The commercialization of NTFPs is less beneficial to rural collectors compared to the other stakeholders involved, whereas they are the main contributors of NTFPs value chain. The main reason for this are the poor organization of collectors, low access to market information, low power in price negotiation, lack of storage and drying facilities, ambient poverty in rural areas as well as the high purchasing power of wholesalers who intervene in the value chain. The strengthening of the capacities for local population on drying, conservation and processing techniques; pricing; the principle of group sale of NTFPs; the creation and empowerment of collectors organization; their networking with buyers; the development of market information systems; and an enabling environment that facilitates market access to local collectors will improve the profitability of NTFP value chain in the area.

Keywords: NTFP, rural collectors, value chain, profitability



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1. Introduction

Globally, more than a billion of people depend directly on forest for their livelihoods (Pandey *et al.* 2016). In Central Africa, 86 million people living in or near forests depend on natural resources for a significant part of their diets (Eba'a *et al.* 2009). Forests provide many resources that can be grouped into timber and non-timber forest products (Suleiman *et al.* 2017). Although minimum attention is given to non-timber forest products (NTFP), in rural communities, trade in NTFPs represent the major source of livelihood and income for the people. Furthermore, NTFPS provide less export revenue than timber, but higher levels of employment (Ingram 2010).

Non-Timber Forest Products represent many goods and services for multiple uses beneficial for the wellbeing of the populations who are dependent on them. The majority of rural households in developing countries and a large proportion of urban households depend on these products to meet some parts of their nutritional, health, house construction, or other needs (Shackleton *et al.* 2015). In Cameroon, many people depend on these products especially because they play a vital role in their life, and their uses vary depending on the feeding habits and cultural practices of populations. Papadopulos (1997) already reported that 300 NTFPs are used in Mount Cameroon area. In the South region of Cameroon, nearly 200 animal species and 500 plant species are used as NTFPs (Van-Dijk and Wiersum 1999). Tchouamo and Njoukam (2000) reported 57 medicinal plants used by Bamilekes in Western Cameroon. In Gribé village of southeastern Cameroon, Hirai (2014) identified 500 NTFPs of which 42 different products were most frequently sold by the local people.

The value of the NTFPs sector in Cameroon is estimated at over 32 million US\$ annually, providing income to about 34,000 people including harvesters and traders (Ingram 2014) and they generally provide employment at different stages from the NTFP gathering to selling. Awono *et al.* (2016) estimated that NTFPs sector providing employments to 283,000 persons working in microenterprises exploiting 16 main products. NTFPs appear to be the basis of the well-being of the rural population. But current strategies for the valorisation of NTFPs sector are not adequately beneficial to local collectors. The main reason for this is the fact that the legal and institutional frameworks for NTFP trade in Cameroon combined with the pervasiveness of corruption, hinders sustainable development of this important and apparently growing sector (Tieguhong *et al.* 2015). Furthermore, quantitative information on the NTFP sector are often fragmentary, thus weakening decision making for sustainably use of NTFP. However, understanding value chain characteristics of NTFP is critical for their conservation and sustainable use. The value chain context is defined by Ingram (2010) as the entire set of processes and activities involved in getting a product from harvest in the forests, including storage, transport, and transformation or processing and marketing to the final consumer. In Cameroon, NTFPs value chain studies are mostly focused on quantities sold, prices and destination of products. Information on the improvement of the power of collectors in the NTFP value chain in rural areas is lacking. The present paper aims to highlight the major NTFPs collected by the population

and, identify the main stakeholders involved in their value chain. This information will be used to understand the power of all the stakeholders in the value chain of NTFPs and to discuss the option for improving NTFP value chain in Gribé village.

2. Research methods

2.1. Study site

Gribé village is found in Yokadouma sub-division of the Boumba and Ngoko Division. It is located about 76 km south-west of Yokadouma town and 16.5 km northeast of Boumba-Bek National Park. It extends on about 12 km, with a population of approximately 772 inhabitants (Toda 2014). The local population consists of two major ethnic groups: the Konabembe bantu-speaking, agriculturalists practice small-scale subsistence and cash-crop farming (cacao); and the Baka, hunter-gatherers who are largely sedentary and economically dependent, as wage laborers for the Konabembe. The annual rainfall varies from 1300 to 1600 mm (Sigha-Nkamdjou 1994). The area is subject to a Guinean equatorial climate with four seasons divided as follows:

- A major dry season from December to mid-march;
- A minor rainy season from mid-march to June;
- A minor dry season in July and August;
- A major rainy season from late August to November (Fongnzossie *et al.*, 2014)

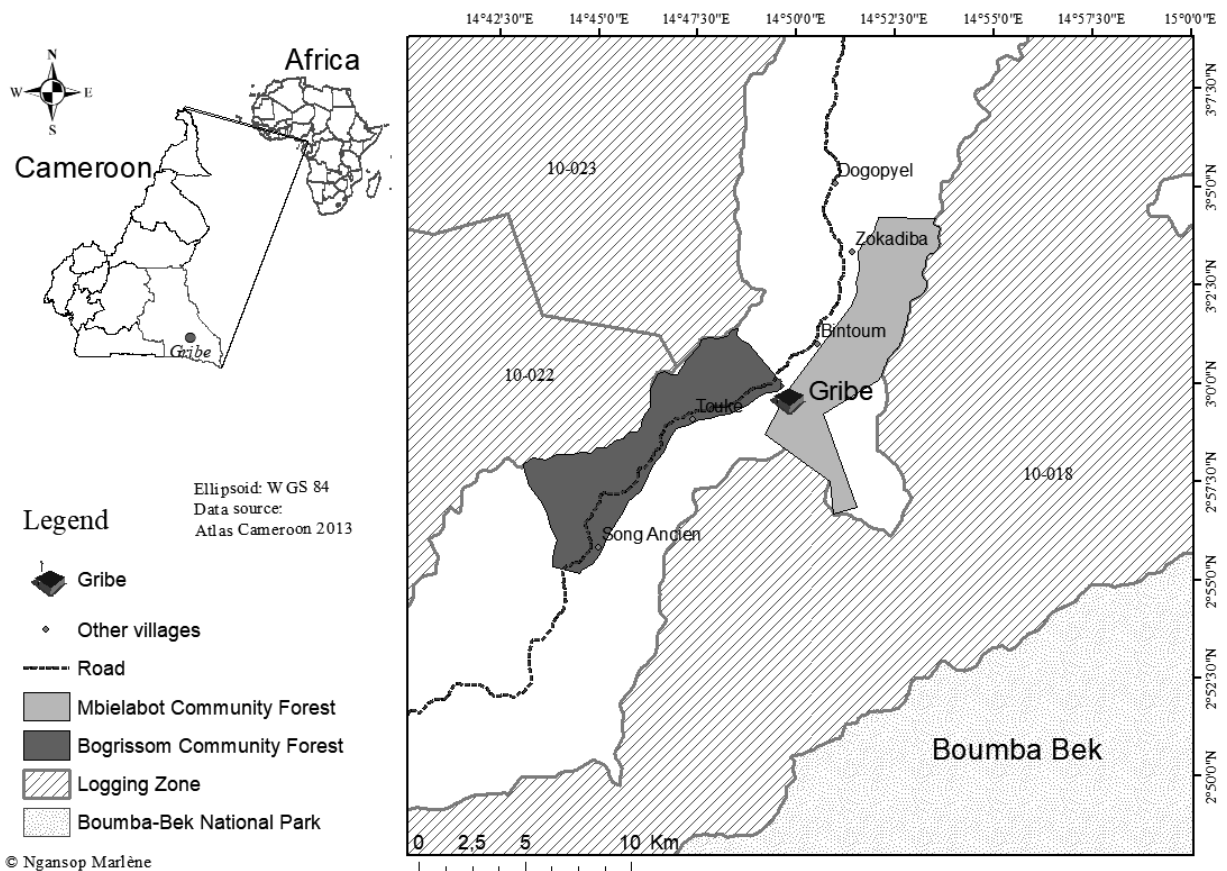


Figure 1. Study site

2.2. Method

This study focuses on all temporal NTFP gathering camps established in the forest during gathering seasons, especially for bush mangoes. All temporary camps established by villagers in the forest were inventoried and geo-referenced. A daily monitoring and quantitative recording in each NTFP gathered in these camps was carried out during the period from August 2015 to September 2016. The major parameters taken into account were: identification of the collectors; the nature of the product indicating the part of the plant collected; the place where the products were harvested; the destination (representing the marketing place of the products: sold to the village or town (Yokadouma)), and the selling price of the product. All these information was used to determine: the main NTFPs collected by the populations, the prices of each NTFP at the local level, the number of stakeholders in the NTFPs value chain, and to establish the value chain for NTFPs in Gribé village.

3. Results and discussions

3.1. NTFP gathering at Gribé

The results show that the main NTFPs gathered at the Gribé based on the quantity collected by each collector were: *Irvingia gabonensis* (Aubry-Lecomte ex O’Rorke) Baill. (42%), *Aframomum* spp. (34%), *Ricinodendron heudelotii* (Bail.) (9%), *Pentaclethra macrophylla* Benth. (8%), and *Afrostryax lepidophyllus* Mildbr (3%). The other products *Scorodophloeus zenkeri* Harms; *Beilschmiedia louisii* Robyns & R. Wilczek; *Baillonella toxisperma* Pierre; *Tetrapleura tetraptera* (Schumach. & Thonn.) Tau; *Panda oleosa* Pierre; *Piper guineense* Schumach & Thonn and Represent 4% of products gathered at Gribé village (Figure 2). All these products are among the most preferred NTFP for commercialization recorded by Fongzossie and Nkogmeneck (2016) in this village.

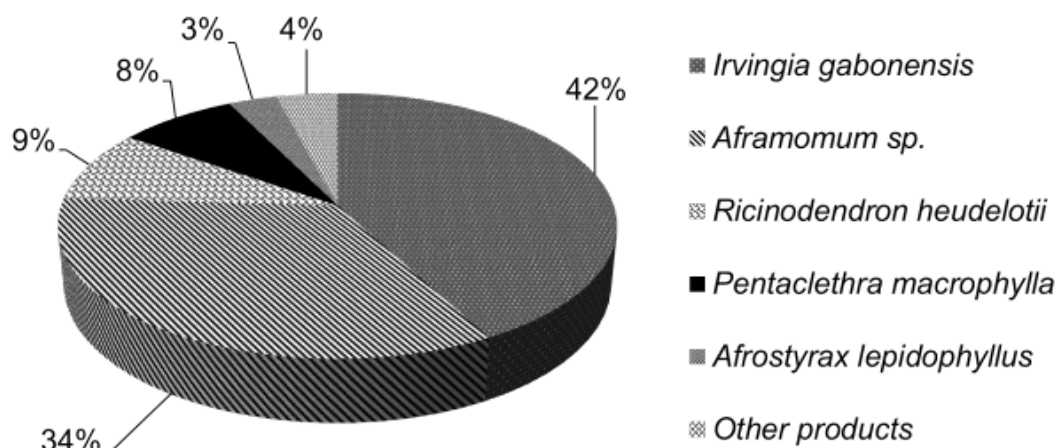


Figure 2. Main NTFPs gathered in Gribé village in 2015-2016

For these products the main parts used are bark, leave, pod, fruit, seed, & kernel (Figure 3). All these NTFPs are first and foremost used in feeding and in traditional pharmacopoeia. Out of the 11 NTFPs

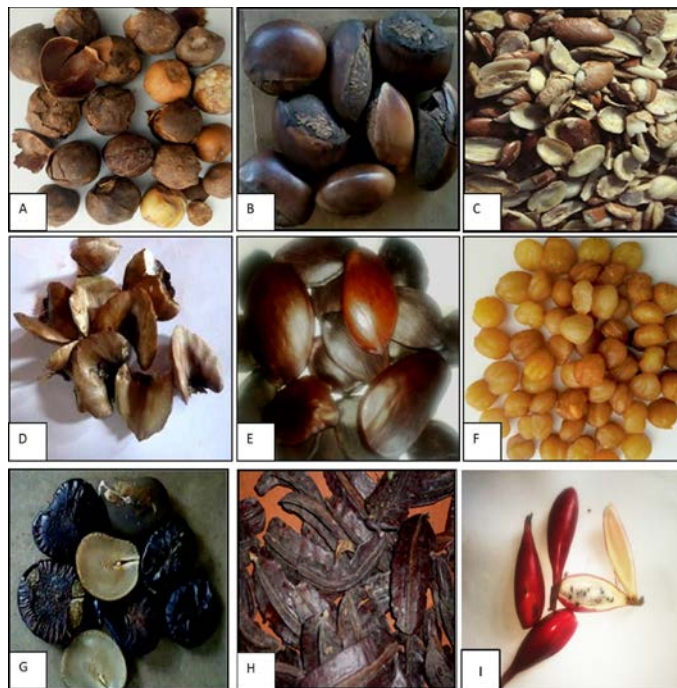
species recorded in the village, only *P. oleosa* seeds are not yet commercialized but only used as food and in traditional pharmacopeia (Table 1).

Table 1. Main uses of NTFPs gathered

N°	Scientific names	Trading name	Main part used	Usage
1	<i>Irvingia gabonensis</i>	Bush mango	fruit, kernel	Food, medicine, cosmetics
2	<i>Aframomum</i> spp.		fruit	Food, medicine, spiritual
3	<i>Ricinodendron heudelotii</i>	Njansang	kernel, bark	Food, medicine, cosmetics
4	<i>Pentaclethra macrophylla</i>	African oil bean seed	pod, seed, bark	Food, medicine, cosmetics, handicraft
5	<i>Afrostryrax lepidophyllus</i>	Garlic tree	seed, leave & bark	Food, medicine,
6	<i>Scorodophloeus zenkerii</i>	Garlic tree	Seed &bark	Food, medicine
7	<i>Beilschmiedia louissii</i>		fruit	Food, medicine
8	<i>Baillonella toxisperma</i>	Moabi oil	fruit	Food, medicine, spiritual, timber product
9	<i>Tetrapleura tetraptera</i>	Aidan tree	kernel	Food, medicine
11	<i>Piper guineense</i>	Guinea pepper	fruit	Food, medicine
12	<i>Monodora myristica</i>		fruit	Food, medicine

3.2. Marketing of Non-Timbers Forest Products

In terms of marketing, as we observed, bark, seed, fruit or kernel (Figure 3) of the aforementioned NTFPs are all auto consumed, sold or exchanged by the populations.



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Figure 3. Fruits, seeds or kernels of some NTFPs: (A) Seeds of *Afrostryrax lepidophyllus*; (B) seeds of *Baillonella toxisperma*, (C) kernels of *Irvingia gabonensis*, (D) seeds of *Panda oleosa*, (E) seeds of *Pentaclethra macrophylla*, (F) seeds of *Ricinodendron heudelotii*, (G) seeds of *Scorodophloeus zenkerii*, (H) seeds of *Tetrapleura tetraptera*, (I) fruits of *Aframomum* spp.

Demand shows higher scores for *Aframomum* spp., *Irvingia gabonensis*, *Ricinodendron heudelotii*, *Afrostryrax lepidophyllus*, and *Pentaclethra macrophylla*. Hirai (2014) reported total sales of NTFPS for

Irvingia gabonensis (2,220.750 CFA francs (approximately USD 4500), for *Ricinodendron heudelotii* (1,333.300 CFA, approximately USD 2700), and *Aframomum* spp. (1,500,000 CFA approximately USD 3000). These NTFPs contribute mostly to the livelihood of population in Gribé village. The NTFPs are directly sold in forest or rural market. The prices of NTFP in local market vary between 0.09 and 0.67 USD per kilogram for products like *Aframomum* spp. *I. gabonensis*, *R. heudelotii* and *A. lepidophyllus* (Table 2). Although *Aframomum* spp. has the lowest trade value, it represents the NTFP that gives more cash income to local populations due to its high availability and the duration of the collection (year-round) Fongnzossie and Nkogmeneck (2016). Its availability could also be attributed to its high growth rate with a rhizome root system favouring spatial its expansion. Prices are generally low in rural markets compared to urban markets for the same products and same quantities (Table 2). Gribé village is located far from the town, about 76 km of Yokadouma town who is the neighboringly town of Gribé, this distance can be at the origin of the low prices of product in local level. Likewise the disequilibrium in prices of NTFP in rural compared to urban market is due to the low power of collectors or traders in price negotiations and low access to market information. Moreover, the absent of constructed rural or regional markets is a reason for the low prices of NTFPs. The development of the rural markets in rural area could empower the rural population in prices negotiation of their products. Shackleton *et al.* (2007) argues that local markets for NTFPs are important especially for poor people. The character of local markets could increase the value of forest for NTFP production (Vuola 2013), give more power to local populations in prices bargaining and create more avenues for villagers to sell their products.

Table 2. NTFPS prices per kilogram in rural and urban market

N°	Scientifics names	Price in rural market (USD)	Price in urban market (USD)
	<i>Aframomum</i> spp.	0.09 - 0.14	0.67- 0.89
	<i>Pentaclethra macrophylla</i> , <i>Monodora mirystica</i> , <i>Tetrapleura tetraptera</i>	0.14 - 0.18	0.67 - 0.89
	<i>Beilschmiedia louissii</i> , <i>Scorodophloeus zenkerii</i>	0.18 - 0.45	0.89 - 1.33
	<i>Irvingia gabonensis</i> , <i>Ricinodendron heudelotii</i> , <i>Afrostryax lepidophyllus</i>	0.45 - 0.67	2.22 - 4.44

3.3. Main stakeholder in NTFP value chain in Gribé village

In Gribé village, there are five main stakeholders involved in NTFP value chain: the collectors comprising both Baka-pygmy's and Konambebe, local traders, mainly the Bantu, semi wholesalers who are urban

citizen, intermediates who are the konambebe generally mandated by wholesalers, and finally wholesalers (Nigerian and Malian living in the village). Toda (2014), identified a total of seven merchants (all of Muslims: Fulbe, Bororo, and Hausa ethnic groups from northern Cameroon, Mali and Nigeria) residing in Grike village. Though the research area is remote from cities, the NTFP value chain includes Cameroonians and non-Cameroonians.

Baka pygmy intervene only in NTFP gathering, they are used by the Bantu as wage laborers and they don't have power in NTFP value chain. Toda (2014), qualified this relation as an ambivalent and complex (involving both positive and negative feelings toward the other) relationship. This unequal relationship appears to change at Ndongo village in East Cameroun. Oishi (2016), asserts that the increased creation of cacao plantation by the Baka changed relationships among the area's ethnic groups, due to the influence of migrant merchants, who play multiple roles in commoditizing the local economy of Bakas and render them more autonomous and less dependent on their traditional patrons (Bantu).

3.4. Organisation of NTFP value chain in Grike village

In Grike village, NTFPs can be self-consumed, given as gifts to people, or exchanged for other goods or product like cassava flour, using the same measurement unit. When NTFP are not eaten they enter in the value chain of NTFPs. In Grike village, the NTFP value chain is complex with multiple actors involved. At the bottom of the chain, we have the collectors who are the main actors in value chain. During the period of gathering collectors generally move from the village to the forest and stay there during the whole period of gathering; living in the forest to collect and sell the products. In the forest collectors gather, crush and dry products manually. NTFPs are generally collected in rainy season and dried under the sun or by exposing products on fire bands when there is not sufficient sun to dry products in the forest. Concerning processing, for all the main NTFPs in Grike village, only *Baillonella toxisperma* kernels are transformed into oil before commercialization or use. In Grike village crushing, drying, processing and conservation of NTFP are not well developed due to the lack of skills and equipment. This accounts for the low development of NTFP sector. Saha and Sundriyal (2012) previously reported that NTFP profit could be increased significantly with semi-processing and grading. Awono *et al.* (2013), highlighted that adding value by simple equipment can boost production, speed up processing times and reduce losses and then packaging can make a major difference to price and quality. Other actors of the NTFP value chain are local traders, who are Bantu speakers. They generally buy and sell to urban semi-wholesalers or to wholesalers (Nigerian and Malian) settled in the villages. But urban semi-wholesalers generally sell directly in the urban market at Yokadouma. One of the most powerful actors of value chain are intermediaries who have a strong influence in NTFP marketing, because they are mandated by the wholesalers who give them money and most of the time some materials and they go to the forest to get products from the collectors. Fongnzossie and Nkogmeneck (2016) mentioned that the reason why NTFP are often exchanged with commodities is that the basic needs of primary collectors settled very far in the forest are much about food, cigarette, drinks,

clothes rather than money in cash because they can't buy anything inside the forest with the money. The presence of intermediaries weakens the power of collectors in NTFP price negotiation, but they contribute to the sales of products collected. The most powerful actors in NTFP value chain in Gribé village are the wholesalers (Nigerians and Malian). They influence NTFP marketing because they generally have the main financial power and have the possibility to buy large quantities, store and sell in urban market at Yokadouma (Figure 4). One of the reasons of the weakness power of collectors (Baka) in the value chain is that they generally take credits as food, and alcohol from the local traders, wholesalers or from the intermediary against their NTFPs. This weakens their power in the value chain because they don't receive the real incomes of their activities. However the power of the collectors can be improved in the value chain.

Oishi (2016) emphasized that creating and owning of cocoa plantations by Bakas makes them more autonomous and gives them direct access to the market economy without mediation and control by neighboring farmers. However, owning cocoa plantations by the Baka does not always guarantee their direct access to the market autonomy as the latter is also conditioned by several other market determining factors such as capital (material cost, labor cost, transport cost), level of education, and mode of life in the case of Bakas which seems difficult to change in a short period. Thus in the case of NTFP collection and marketing, if the aforementioned conditions are established Baka can be owners of the products collected, it would give the Baka more power in the value chain and direct income from NTFPs.

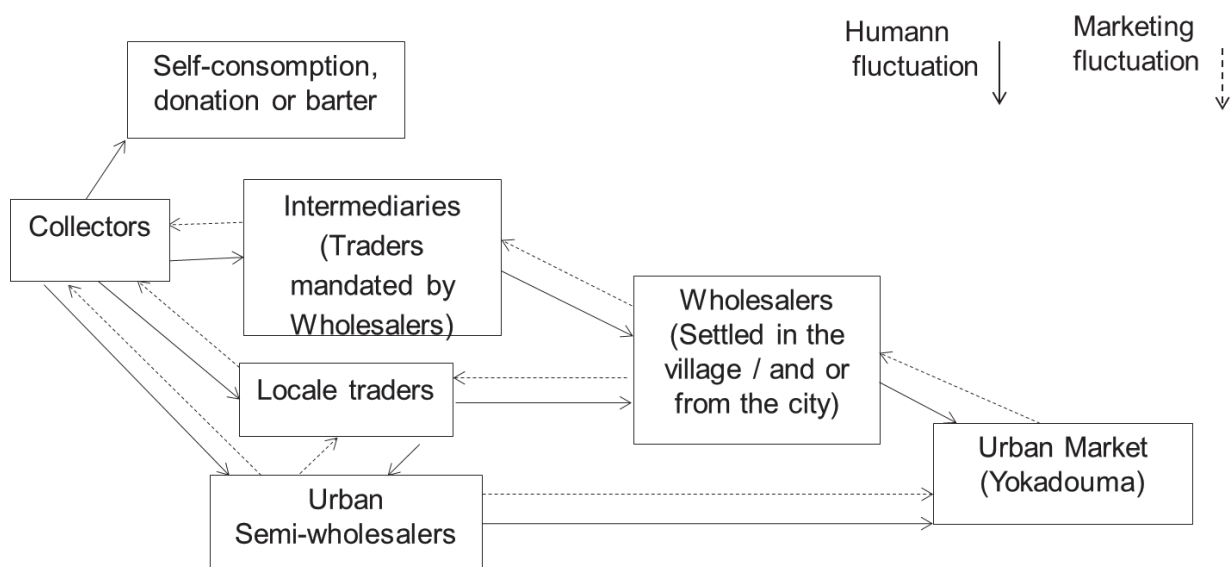


Figure 4. NTFP Value Chain in Gribé village

In Gribé village, the NTFP value chain is complex, with several stages involved in the process of getting product from forest to the market. There were at least four level of commercialisation between the collectors and urban market. This contributed to the poor income of collectors. Furthermore, in the forest, two kilogram of product is exchanged for two kilogram of cassava flour (Figure 5) or five doughnuts or 15 sachets of whisky. NTFP gathering usually requires much labour but collectors do not generally receive the

main part of income, all other actors generally have more power in the marketing process in Gribe village.

In Cameroon, NTFP exploitation permits are not accessible to the small collectors or traders and do not give the possibility for them to develop their activities. Nevertheless, the applied tax is accessible and gives the possibility to the wholesaler to have more income. Every person or organisation intending to commercialise ‘special forestry products’ and other NTFPs first needs to be approved by the Ministry of Forestry and Wildlife (MINFOF) in Yaoundé. This approval allows access to the sector and renders the trader legal. To obtain approval, a file is required with fee costs of 150,000 CFA (333 US\$) (Tieguhong *et al.* 2015).



Figure 5. Exchange two kilogram of bush mango kernels by a two kilogram of cassava flour (One bowl equal tow kg).

3.5. Conclusion

In Gribe village, gathering and marketing of main NTFPs is an activity done by people in order to take care for their primary needs. But the conservation techniques of these products are not well developed. The NTFP value chain is complex, with multiple actors involved. Profit margins of the main collectors are very low compared to semi-wholesalers and wholesalers, due to the poor organization of collectors, low access to market information, low power in price negotiation, lack of storage and drying facilities, ambient poverty in rural areas as well as the high purchasing power of wholesalers who intervene in the current value chain. The NTFP value chain in Gribe village needs some focus action such as providing equipment to the collectors necessary for collection, processing and conservation; building the capacities of collectors on drying, conservation and processing techniques, creating and empowering collectors organization and their networking with buyers, developing of market information system and an enabling environment that facilitate market access to local collectors. Together these solutions can give more power to local collectors in the NTFP value chain in Gribe village. Furthermore, improving NTFPs quality can improve NTFP price in rural, national and international markets and then reduce the pressure on forest resources and on biodiversity in general. However, more research is needed to improve the power of collectors in the process from gathering to selling products so that the income of the collectors can be increased contribute to biodiversity conservation in rural areas.

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