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Market survey of *Garcinia kola* (Bitter kola) in Yaoundé city, Cameroon

Master thesis

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Declaration

I, Ondřej Přibyl, declare that I have elaborated my thesis "Market survey of *Garcinia kola* (Bitter kola) in Yaoundé city, Cameroon" independently and that I cited only literature listed in references. Nonetheless, additions of other were involved, especially under the guidance of thesis supervisor Dr. Vladimír Verner.

Prague 6 – Suchdol, 27th of April, 2017

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Ondřej Přibyl

Acknowledgements

Abstract

This study describes vendors of *Garcinia kola* (bitter kola) in Cameroon capital city Yaoundé, determines their type, prices, selling practices and knowledge about bitter kola potential utilisation. Bitter kola is a medicinal plant species that is predominantly collected in the forests of western Africa with very limited knowledge on its chemical composition as well as on commercialization and market-chains. Thus, the aim of the survey was to document typical sellers of bitter kola in agrarian market placed in the capital city of Yaoundé. We focused on four districts with increasing distance from city centre and two markets. Total number of 71 respondents selling bitter kola participated in our survey, 36 street vendors, who were further divided into street mobile-vendors and stall-holders and 35 market traders. We applied semi-structured questionnaires with both closed and open-ended questions. Based on our results, most of the seeds were traded by market traders, consisting predominantly of women (86%) with an average age of 49.9 (±9.92) years, selling bitter kola to a very diverse group of customers. Street mobile-vendors were predominantly young boys (95.6%) with average age of 15.6 (±3.16) years for whom it was a seasonal job to earned cash to cover their school fees. They operated close to main streets in Yaoundé with taxi drivers as main costumers. Last group of vendors were stall-holders, mainly women (58.3%) with average age of 38.5 (±7.56) years, situated far from main communications and selling a wide range of products to passing-by people. All types of sellers differed in selling prices and selling volumes. While street mobile-vendors and stall-holders used three seeds (≈ 15 g) as the main unit at an average price of 100 CFA (0.15 €), market traders used mainly cups (≈150 g) for 500 CFA each (0.76 €). Generally, most traders came to Yaoundé city from the Western region of Cameroon and as well as the majority of bitter kola seeds. However, there was not proven connection between seed flow and vendors origin. Survey showed important role of collectors as most of vendors (54.8%) were purchasing bitter kola directly from them. Finally, majority of vendors (88.7%) stated selling seeds of bitter kola for their medicinal potential, mostly as a treatment against stomach or digestive problems. Study concludes that bitter kola seeds were commonly traded in the study area as medicinal plant and generated additional cash income for vendors.

Key words: *Garcinia kola*, market-chain, medicinal plants, non-timber forest products, vendors, Yaoundé, Cameroon

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1   Introduction

Developing countries are very rich in resources of medicinal plants which are used over hundreds of years for increasing of human welfare. Thanks to confidence in medicinal plants almost 90% of the world population in rural areas is able to maintain good health conditions (Cunningham, 1997). Many of these species are classified as non-timber forest products (NTFPs) which are defined as products that "… encompasses all biological materials other than timber, which are extracted from forest for human use," (de Beer & Mcdermott, 1989; Belcher, 2003). Apart from medicine, many of those species have other socio-economical functions, such as supporting nutrition and food security, contributing to household income or conserve local traditions and human values. Despite of, or rather because of that, these species have been over-used and even endangered with extinction, which can reduce regional biodiversity and significantly reduce above mentioned socio-economic roles (IUCN, 2004).

For one of those products it is considered *Garcinia kola* (bitter kola), tree species common in sub-Saharan Africa, including Cameroon, and popular mainly for its seeds that are traditionally used not only the medicinal potential, but also for cultural importance for local people (Terashima, 1999). Besides that, *Garcinia kola* is very common source of income for small-scale farmers, particularly in rural areas. The seeds of the tree, most valuable product, are collected predominantly from wild population and selling at local markets. However, there are relevant market- and/or value-chain analysis of this plant partly documented from its habitat area, such as from certain parts of Nigeria (Agbelade & Onyekwelu, 2013) or from Benin (Dah-Nouvlessounon et al., 2015). However, in general, such studies are very limited, including Cameroon.

Market places in both urban and rural areas represent important regional cultural hub and may provide valuable information on traditional products, including medicinal or food plant species from local areas, which are commercialized (Cunningham, 2001; Williams et al., 2007a). Survey of such markets can identify how many people is connected to commercialization of particular species, in our case bitter kola, and to document whole market-chain from collector and producers to consumers (Lundy et al., 2004, 2007). This could find out new information about selling

commodity, as well as about the new localities where it occurs. Additionally, value-chain analysis can identify important routes and actors and the distribution of added value to the product (Marshall et al., 2006).

Presented thesis was aimed to survey agricultural markets in Cameroon capital city Yaoundé and to document who was incorporated in *Garcinia kola* commercialization, what were the marketing practices as well as prices, volumes sold and typical consumers. Furthermore, we documented the knowledge and awareness about the properties of seeds among vendors. We also documented the origin of the traders and the seeds as well, which could serve for further research on market or value-chains. All these information could also help to identify new areas with occurrence of bitter kola and contribute to discussion on its domestication, which is a necessary step against threat of extinction or depletion of *Garcinia kola* reservoirs in local forests (Tchatat, 1999).

2 Literature review

2.1 *Garcinia kola*

2.1.1 Geographical distribution and role of *Garcinia kola* for local and farming systems

Bitter kola (*Garcinia kola* (Heckel)) is a medium-size tree from *Clusiacea* family with high up to 12 m. While geographical distributions of *Garcinia* spp. comprise tropical areas in Africa, America and Asia, *Garcinia kola* is distributed specifically in the western part of Sub-Saharan Africa, from Sierra Leone to Angola. Habitats of bitter kola are evergreen lowland forests or coastal areas in altitudes up to 300 meters above the sea level and average precipitation ranging between 2,000 and 2,500 mm per year. It has good shade tolerance and is able to grow on poor soils (Ntamag 1997; Eyog-Matig et al., 2007; UNAFAS, 2008; Odenbunmi et al., 2009). *Garcinia kola* represents a multi-purpose species from which is possible to utilise all parts for wide range of uses as well as to introduce it in cropping systems as a shading tree, for example in cocoa in plantations (Fondoun & Manga, 2000; Indabawa & Arzai, 2011). As stated above, different parts of the tree could be used, such as bark can be mixed with sugar cane juice or palm wine to increase the alcohol contain, latex could be applied to the wound, gum is possible to apply as a treatment for gonorrhoea and wood for energy purposes (Sunderland et al., 2000; Leakey, 2012). Due to this multifunctionality and big economical potential *Garcinia kola* represents one of six tree species which were selected by researches from ICRAF Cameroon (Tchoundjeu et al., 2006; Odenbunmi et al., 2009; Asaah et al., 2011). It means that continues research of this plant species can be very useful for increasing knowledges and economical potential of *Garcinia kola*.

2.1.2 Use of *Garcinia kola*

Almost all parts of the tree could be utilised, but two of them are used the most – seeds and bark. Harvesting method of seeds is less destructive compare to bark and thus lees undermining the sustainability of the supply potential and collected particularly in the forest as the level of domestication of *Garcinia kola* is not practiced yet or at very low

level only the harvesting method of fruits is more sustainable. The ripe fruit is picked at the foot of the tree or picked using a pole (Mbolo, 2002). Particularly seeds represent the most valuable part of the tree, one fruit can contain one to five compact brown seeds ellipsoid shape imposed in orange endocarpic pulp and length 3 – 3.5 cm (Figure 1; Mukhtar & Shuaibu, 1999; PROTA, 2015). Seeds are slightly acidic and bitter and one of the most common uses is a food – they are chewed, similarly to *Cola acuminata* and as a stimulant or aphrodisiac (Vivien & Faure, 1995). Furthermore, they can be used in a food industry as a substitute for hops in brewery (Fondoun & Manga, 2000; Leakey, 2012).

a)   **b**)
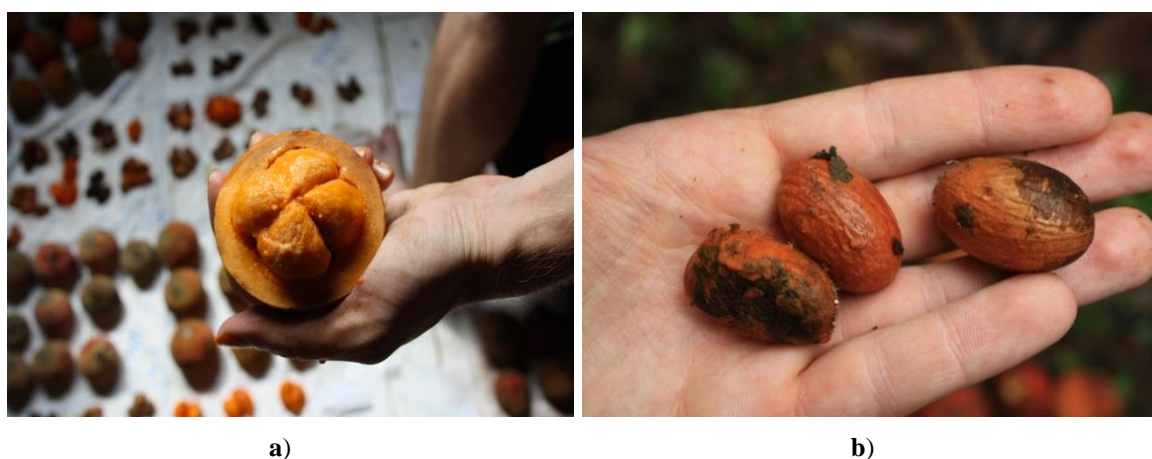
Figure 1
Seeds of *Garcinia kola* briefly after removal from fruit
a) Seeds in fruit **b)** Individual seeds
Photo by: Anna Maňourová, author

However, the main advantage of seeds is particularly their value for their high medicinal potential. This is thanks to the compounds of bioflavonoids, xanthones and prenylated benzophenones. Bitter kola has antioxidant ability as well and major component of bitter kola, kolaviron, is able to prevent hepatoxicity (Terashima 1999, 2002; Farombi, 2002). The seeds are used in traditional medicine system as a treatment for bronchial problems, hoarseness, urinary tract infections or liver disorders in a dry form, ground or mixed with honey (Odenbunmi et al., 2009; Indabawa & Arzai, 2011).

In study of Adodo (2000) is pointed that chewing of raw seeds can mitigate cough and remove tonsillitis. Such a local plant is very often used for its effectiveness, cultural and

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religious preferences – can be offered as a gift, marriage ceremonies, after concluding agreements and other social ceremonies (Sheldon et al., 1997; Terashima, 1999).

As stated above, *Garcinia kola* plants grow particularly in primary and secondary forest and very rarely are purposively planted in homegardens, especially due to the difficulties with domestication. Dimelu & Odo (2013) pointed in their study that bitter kola is cultivated in in households for its medicinal benefits. Main problem is with the seed germination, which is common for several *Garcinia* species because of 18-months long process of dormancy. Biter kola is very often growing even as part of cocoa or coffee plantations. For young trees should be prepared shading (Ntamang, 1997; Eyog-Matig et al., 2006; 2007). Study of Kanmegne & Omokolo (2008) pointed on the variable germination of *Garcinia* spp. Due to slow-growing of *Garcinia kola* the first fruiting is expected only after seven or eight years after planting (Eyog-Matig et al., 2006). Particularly such long time period between planting and first valuable harvest represents a serious economic obstacle for farmers who are forced to generate production for commercialization fast to meet the market requirements, which is typical for small-scale farming systems based on perennial crops. Additionally, there is no information relating to the harvesting potential of medium-sized trees. Moreover, there is no exact consensus in available literature on the storage requirements of the seeds and storage techniques are different not only among region but also among farmers (Ndoye et al., 2000; Eyog-Matig et al., 2006). Study of Ofor et al. (2010) observed shelf life of storage seeds in different type of storage practise among one week and more than two months. In his observation the most commonly used means were polyethylene bags and dry plantain leaves. All these aspects underline the fact that the economic potential is not yet fully documented in scientific literature and call for more information on storage techniques as well as appropriate methodology to assess the seeds value in terms of quality and quantity. Last, but not least, there is lack of information on financial volumes and quantities of seeds sold at local markets.

2.1.3 Economic potential of *Garcinia kola*

In mid-1990s, the area affected by the commercial exploitation of the bark of *Garcinia kola* was estimated between 738 to 29,500 hectares. For the following year, these figures were between 450 and 18,000 hectares (Van Dijk, 1995; Guedje, 1996;

Doucet & Koufani, 1997; Ntamag 1997). This situation is believed to continue to these days and only very little scientific attention is given to the domestication of *Garcinia kola* by households living in forest as it remains only partially integrated in the research programs on Non-Timber Forest Products (NTFPs) in West and Central Africa (Ndoye et al., 2000). Estimated production and sale of *Garcinia kola* in all markets with NTFPs gave in 1995 an amount of 16,200 kg of bark for a value of 3.97 million CFA (6,353 € in 1995; FXTOP.com), representing 0.09% of Cameroon's GDP (4.529 billion CFA). In 1996, an amount of 9,900 kg for 2.11 million CFA (3,089 € in 1996; FXTOP.com), which represents 0.04% of country's GDP (4,884 billion CFA) (Ndoye et al., 2000; IMF, 2017). *Garcinia kola* has been marketed at both, regional or national, as well as at international levels. At the regional level, it is exported from Cameroon to neighbouring countries, such as Nigeria, Gabon, Central African Republic and Equatorial Guinea. Gabon alone, imported *Garcinia kola* products in total value equal to 6.9 million CFA (11,041 €) in 1995 (Ndoye, 1995; Ndoye et al., 1997; Ruiz Perez et al., 1999; Ayuk et al., 1999a; Ayuk et al., 1999b; Tabuna, 1999). International exports go particularly to Europe as three tons of bark and seeds of *Garcinia kola* were exported there in 1998 (Tabuna, 1999). Awono et al. (2016) pointed that in 2014 were total amount of 50 tons seeds sold without permit, which contributes to the Cameroonian economy via 375 million CFA (571,684 €), representing 2.4% of national GDP (IMF, 2017). This number is interesting because the sold amount of seeds of bitter kola was the second lowest number from nine species of NTFPs which were sold in Cameroon without permit. Other remarkable fact is price per one kilogram of seed of bitter kola. *Garcinia kola* has the biggest value, which is equal to 2,500 CFA (3.81 €). This price is influenced by seasonality, as harvest is annually done from July to October and differs among regions of origin (Eyog-Matig et al., 2006; Ofor et al., 2010). In study of Dah-Nouvlessounon (2015) is noted that in southern Benin bitter kola produces during whole year with main peaks in April, August and November. Other reason is traditional use for its medicinal ability. On the market the prices of seeds are determined more by abundance, season and market location. Size and weight also plays a role resulting in a price ranging between 25 and 75 CFA per one piece (0.04 – 0.11 €; Eyog-Matig et al., 2006).

2.2 Agricultural markets and market surveys

2.2.1 Importance of agricultural markets for research

Important feature of local markets is that they can be found in big cities as well as in rural areas, which gives a researcher an opportunity to compare differences among markets, particularly in terms of prices and volumes sold (Hooper & Field, 1937; Linares & Bye, 1987; Williams et al., 2009). Generally speaking, market is created if potential buyer meets potential seller of good or service, and if they both have available the means of exchange and communication (FAO, 1995; Veeman, 2002; Caluwé, 2011). Usually market is considered as a place of intensive interaction between traders and consumers, as well as people from different socio-economical groups (Vlková et al., 2015). Each market should meet the four basic features, i.e. supply, demand, transport cost and different types of relationship among market players that are normally termed 'linkages' in economic geography (Berry, Conkling & Ray, 1976; Healey & Ilbery, 1990; Ruiz Pérez et al., 2000). For scientists is beneficial that reflect regional culture and trade. Furthermore, they represent ideal places for study not only of commercialization, but also the utilization of local natural product, which being sold there (Hooper & Field, 1937; Linares & Bye, 1987; Nicholson and Arzeni, 1993; Hanlidou et al., 2004; Macia et al., 2005; Albuquerque et al., 2007; Bussmann et al., 2007; Lee et al., 2008; Williams et al., 2007a, b; 2009; Mati & de Boer, 2011). This leads to recognition of market as easily place for fieldwork focused on social and economic aspects of plants use (Bye & Linares, 1983; Martin, 1992; Cunningham, 2001; Nguyen, 2006). In markets studies, scientists are able to recognize and to determine changes in food supply, importance of sources, affections from new regions, socio-economic changes and preferences of goods (Van der Berg, 1984; Nguyen, 2006). Studies of market goods can identify not only the cultivated species or food preferences of local people, but they also bring information about interaction between plants and people in a given region. Documentation of the knowledge from traders or customers on the markets is essential for documentation of species preferences as well as for conservation of local species (You-kai et al., 2004; Vlková et al., 2015).

2.2.2 Market survey and market-chain analysis

As already stated earlier, any market would not exist without people, who are involved to the producing, processing, transporting, price negotiating and selling, and consuming. Each of them has its own role, which is usually connected with each other. However, role of each actor is very specific (Dijkstra, 1997; KIT & IIRR, 2008; Caluwé, 2011). Number of authors described several types of roles of the actors involved to the trade (Dijkstra, 1997; Ferris et al., 2006; KIT & IIRR, 2008). In this study the type of classifications of roles of particular actors was made by Caluwé (2011).

Producer: In most of case is a farmer who is responsible for production of the product. Can be focus for the production only or can sell small amount from surplus of his harvest.

Processors: This role can be managed of small households or larger firms. Their role is preparing the product to form of good to be able to sell in market.

Collectors: In tropic areas can be for farmer difficult to hire a transport and go to the market, where can get better price. For that he uses the service of collectors. Collectors operate in short distances (e.g. in the villages around bigger city) and buy small amount of goods from producer. Usually have simple transport car and limited amount of money. They buy from individuals or groups of farmers. At the market they sell the goods to middleman, retailer or wholesaler. Collectors charge the percentage of the price for which is the product finally sell for this service.

Assemblers: Similar role as collectors but in bigger. They buy the goods from farmer or from collectors and sell it to wholesaler or other traders who do not have time to buy in small amounts from distanced producers. Assemblers can own or rent small storage facilities and motor transport. That gives them an opportunity to travel to larger distances than collectors.

Names "collectors" and "assemblers" can be replaced by term "**middleman**".

Wholesalers: The main sources of their goods are traders, assemblers or other wholesalers. Occasionally they may buy from producer or collectors. The amount of goods is bigger than in assemblers and they can store the goods for the certain period of time. Usually also have possibility of transporting goods. Main role of wholesalers is supply the larger urban markets in the cities and sell to other wholesalers or retailers.

Retailers: Very diverse group. They can be size of kiosk or shop. Usually buy from farmers, traders or wholesalers. The smallest retailers buy from the bigger retailers as well. Main role of them is distribution of the product to the consumers – take the goods and display them as convenient to consumers.

Each group has direct or indirect impact of the final price of product. However, the most criticized for accusation of farmers are traders and intermediaries (Schreckenberg, 2003). Nevertheless, it would be a mistake to overlook the role of middleman, who are underestimated and their influence on the final price is important as well (Paddoch, 1992; Corry, 1993). All nodes of the market-chain are responsible for final value of the product by the influencing of its final price during the way from producer to consumer. All of them create a value-chain. However, not every value-chain contains all mentioned nodes.

2.3 Market and market-chain analysis

Market survey is a basic tool to obtain basic information about market and its distribution. Through market survey would be possible to obtain existing nodes, traded volumes and also prices that are determined specifically on every market during the bargaining between seller and gatherer, and is finally offered to potential consumer. There is a consensus, that price should lead to the equilibrium between the lowest price for the seller and the highest price for the gatherer, while reflecting the volume of the product (Mander, 1998; Sunderland et al., 2004). Furthermore, market survey enables to capture the information on the richness of traded species as well as specific product-related as well as socio-economic and demographic information about the vendors, who are selling particular products. This can help to identify cultural domain of the species

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and to understand better the cultural importance of species, their availability, uses and other useful information (Cunningham, 2001; Quinlan, 2005).

Market survey may also give an insight into the salience of the selling products (Albuquerque et al., 2007; Bussmann et al., 2007; Williams et al., 2007). Cunningham (2001) pointed at the fact that thanks to market survey it is possible to capture information from the trade that could help us to estimate the richness of traded species. Nevertheless, market survey can identify important plant species for local people and is usefulness for further estimations of their economic and cultural importance (Williams et al., 2005; Vlková et al., 2015).

Market surveys thus could easily recognize all links that connect each node and payment which is a part of movement of product from producer to final consumer, or describe a market-chain (Lundy et al., 2004; Ferris et al., 2006; Lundy et al., 2007). That means focus on flow of material sources, finance, knowledge and information between them (Gibbon & Ponte, 2005). Figure 2 shows one of description of present market-chain with NTFPs in Cameroon.
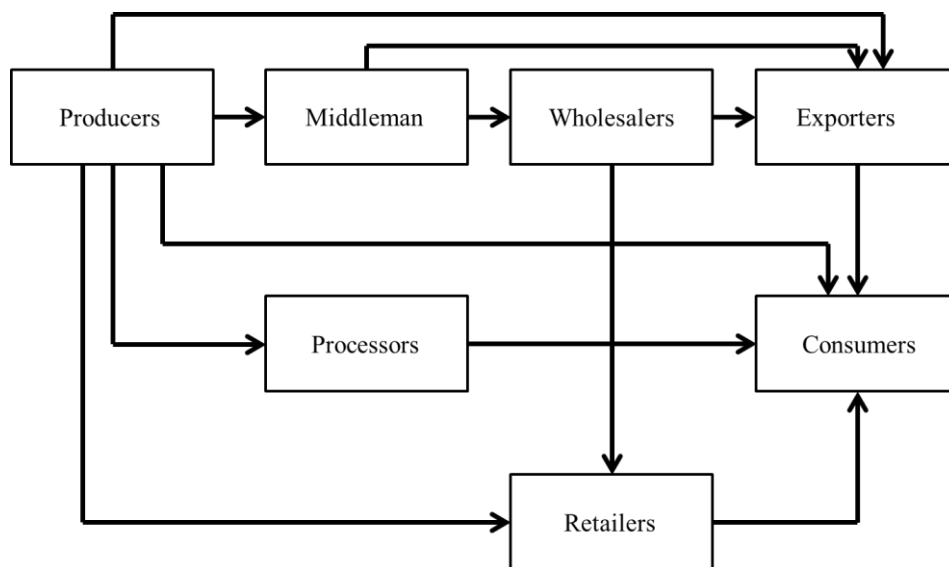
Figure 2
One of possible appearance of market-chain of NTFPs in Cameroon
Source: author, based on Awono et al. (2016)

2.4 Value-chains analysis

2.4.1 Introduction into value-chain theory and analysis

Market surveys and market-chains analysis are very useful tools for mapping and developing of value-chain. Generally, if value-chain is working well it has an ability to contribute to improving food security, conserving biodiversity and generating incomes from plant species commercialisation and also higher employment in the region (Will, 2008). Main role of value-chain is to describe full range of activities which are necessary for bringing a product or service from production or harvesting place through different phases of production, processing and marketing to the distribution to final consumer and final disposal after use (Kaplinsky & Morris, 2001). Strength or efficiency of any value-chain is derived from its weakest node. It means that if e.g. trading would not work appropriately, production as well as consumers will be affected negatively as well (KIT & IIRR, 2008).

2.4.2 Value-chain analysis objectives

Value-chains analysis are focused mainly on chain optimization with special focus on demand-driven requirements, tendencies towards products differentiation, lower interconnection between the actors and priority on increasing of the quality and the value. This differ them from production or traditional chains, which are rather supply-driven, characterized by basic/identical products, interconnected actors, low or no information flow and focus on price and costs (Hobbs et al., 2000). However, Rich et al. (2011) pointed in his study that one of criticism of value-chain process is usually its limited emphasis on collection and analysis of quantitative data. Four elements in value-chain analysis were identified in the study of Kaplinsky & Morris (2001, Table 1.)

Value-chain which is focused on concrete product could be considered as a relevant unit which is targeted at competitiveness. Thanks to this is assumed that coordination of value-chain is one of source for completive advantage (Negassa et al., 2012). It can be use in case of perfect competition with free entry and exit, where under its condition profit maximization by economic entities means that marketing margins is equal to

marginal costs of marketing activities (Helmberger & Chavas, 1996). As result of this new participants will be attracted, due to lower marketing costs and higher marketing margins, which help to erode margins as later entrants (Piggott et al., 2000).

Such traditional value-chains are running under perfect competition, where all sellers as well as nodes throughout the chain are considered as price takers with very low possibility to affect final price in particular nodes.

Table 1 Characterization of value-chain analysis

Element of value-chain analysis	Items included
Systematic mapping of the actors participating in the production, distribution and marketing	Characteristics of actors
	Profit and cost structures
	Product flows
	Risks and constrains
	Sustainability
Assessment of governance in the value chain	Structure of relationships and coordination between actors
	Allocation of responsibility for coordinating activity
Prospects for upgrading within the chain	Capability of actors to innovate and ensure continuous improvement in product and process development
The distribution of benefits of actors in the chain	Analysis of margins and profits within the chain

Source:
Adapted from Kaplinsky & Morris (2001) and Negassa et al. (2012)

2.5 Non-timber forest products collection, use and marketing

2.5.1 Non-timber forest products role in livelihood maintenance

Commonly uses as goods for trade in local markets in Africa have NTFPs and profits from these sales are very important especially for cash-poor households (Obiri et al., 2002; Assogbadjo et al., 2008; Jusu & Sanchez, 2013). Role of NTFPs as well as role of whole forest is today serve as "safe net" which offer cash income and subsistence for poor people (Shackleton et al., 2011). Most of NTFPs is easy find as part of local markets. Besides sales, those products can be used as maintenance of nutritional balance in diets or medicinal means. Therefore, many people depend on

NTFPs not only in rural areas but also in market centres (Marshall et al., 2003; Shackleton et al., 2007). Peri-urban markets with NTFPs provide this type of goods for customers but create new employment for vendors and processors of NTFPs as well. Moreover, new type of customer is created in urban NTFPs markets by group of recent city migrants who are used for consumption of these products who have no more opportunities to collect it and therefore have to purchase it (Ndoye et al., 1998). Value-chain analysis focused on NTFPs was added to the research possibility in 2009 (Jensen, 2009). NTFPs are usually harvested from wild parts of forest which are free-access for all gatherers. With regard to it collection of these products can very often leads to over-collection and conflicts because products become rare (Belcher & Schreckenberg, 2007). Big problem for production of NTFPs is a competition between traditional users and loggers who have tendency to destroy part of forest (Nef, 1997). Shanley (2002) pointed that variability in production of NTFPS and their decreasing level of availability due to logging of dual purpose tree species and large deforestation arising from that is serious problem. NTFPs markets in humid forest zone in Cameroon revolve around buyers-sellers in various categories (Ruiz Pérez et al., 2000). Tendency of being sellers on NTFPs markets have women. Farming of tree (and treatment about them) is usually male discipline. However, for sale of products women are usually responsible (Onyekwelu et. al., 2015). Nzemen (1993) pointed in his study that majority of sellers in markets in Cameroon are women. In many medium and large size cities of Cameroon may be find markets with lower or bigger specialisation on NTFPs. Frequencies and regularity of these markets is affected by size of the city and formally authorities are responsible for these parts which are focused on selling of NTFPs. However, in practice the traders manage this type part of market informally through rules and allotment of space mutually agreed all of them. Traders of NTFPs usually pay entrance fee and stall fee in case that they have a permanent storage-selling opportunity (Ruiz Pérez et al., 2000). *Garcinia kola* is commonly traded at local markets in Cameroon with relatively bigger abundance in south part (Pérez et al., 2000). However scientific data on existing market-chain and possibilities to develop value-chains are missing.

2.5.2 Use of value-chain analysis in *Garcinia kola* research

Market survey serve as a useful base for following studies such as market-chain and value-chains, and it could be used for development of bitter kola chain as well. Information about economic value and value-chain of bitter kola are still missing. This study can be a basement for future economic work. However, there is still missing market survey which would be focused primary on information about sellers of bitter kola. Moreover, value-chain analyses are very important tool in understanding necessity and range for systematic competitiveness (Kaplinsky & Morris, 2001).

3   Aims of Thesis

Marketplaces represent great places reflecting a region's culture and trade. Moreover, they could give a rapid insight into commercialization and utilisation of local agrarian products, and, they are a good starting point to understand local market-chains as well. Furthermore, local markets are particularly useful for documenting the use of plant species that remain so far neglected or underutilised at global level. Thus, the aim of the study was to get first overview on the level of commercialization of *Garcinia kola* H. (bitter kola), local underutilised tree species with promising but yet not well documented medicinal and nutritional potential, at local agricultural markets in one the most important hub in Cameroon, the capital city of Yaoundé.

The specific objects were to document:
- who was a typical seller of biter kola seeds;
- what were prices, selling volumes and practices of particular vendor types;
- who were the consumers and what were their preferences and reasons to purchase bitter kola seeds.

Following research questions were raised:
- Is there any difference between particular vendors in terms of gender, age and/or selling practices?
- Are local sellers also producers/collectors of bitter kola seeds? If not, what is the potential role of collectors and producers in bitter kola market-chain?
- Is medicinal ability a main driving force of consumer to purchase the seeds?

4   Methodology

4.1   Cameroon description

Cameroon (officially name The republic of Cameroon) is a state situated in Central Africa, bordered with Nigeria, Chad, Central African Republic, Equatorial Guinea, Gabon and Republic of the Congo. In southwest part is access to the Atlantic Ocean in Gulf of Guinea (Figure 3). Total area is 475,440 sq. km and number of inhabitants is over 24.3 million with annually population growth 2.5% (Figure 4; World Bank, 2016; CIA World Factbook, 2017). State is administrative divided in ten provinces, which further includes division, subdivision and districts. Eight out of these provinces (Adamawa, Centre, East, Extreme North, Littoral, North, South and West) are francophone and two (Northwest, Southwest) anglophone. Each province has own capital city which serves as administrative centre. Capital city of Cameroon is Yaoundé while Douala, capital city of Littoral region, is the main economical centre as well as city with the largest population (Pamo, 2008).

Figure 3
Political map of Cameroon
Sources: worldatlas.com; commons.wikimedia.org

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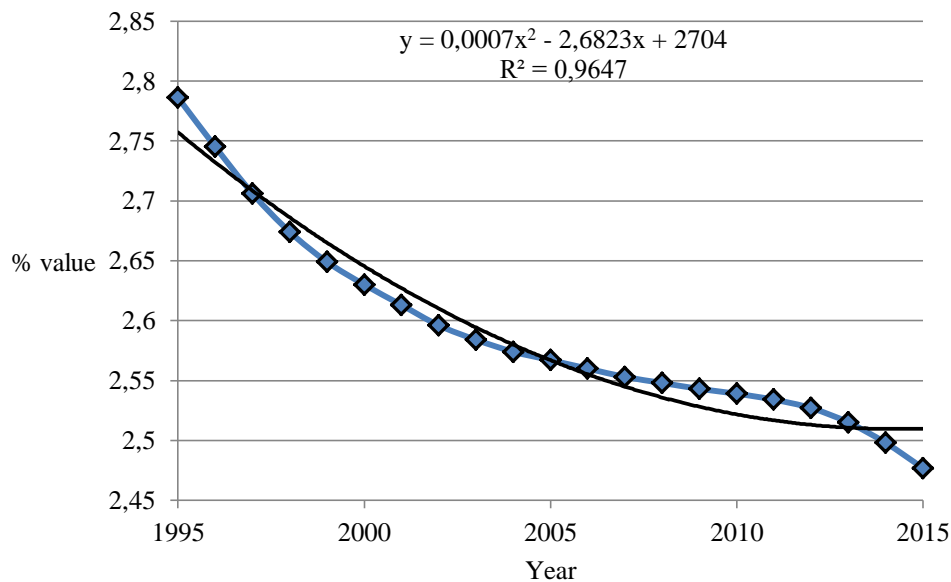
Figure 4
Total population growth (1995-2015)
Source: World Bank, 2016

Average economic growth of Cameroon in 2015 was equal to 5.55% (±2.44; Figure 5), which is lower compare to neighbouring countries such as Gabon (5.90%), however economy is more stable due to lowest SD (World Bank, 2016). In 2016 were slowed economic activities due to slower growth of oil production because of maturity of main fields and epidemic of avian flu in West province where is focused 80% of total production (World Bank, 2017). Irrespective, agriculture is a strong pillar of Cameroonian economic, in 2015 created 22.82% of GDP (Figure 6). Agricultural land covers 20.63% and arable land creates 13.1% from this value. Both values are constant from 2011 (World Bank, 2016). Number of people who work in agriculture is decreasing. In 2001 worked in agriculture sector 61% of Cameroon inhabitants, in 2005 it was 56% and 53% in year 2010 (World Bank Indicators, 2016). Oil palm is very important cash crop not only for whole economic but also for small-holders who are responsible for two-third of total production. Other cash crops which are cultivated in Cameroon are affected by province, e.g. cocoa (*Theobroma cacao*) and coffee (*Coffea* spp.) and tobacco (*Nicotiana* spp.) in the South, cotton (*Gossypium* spp.) and groundnuts (*Arachis hypogaea*) in the North (Degrande et. al, 2006; Pamo, 2008).
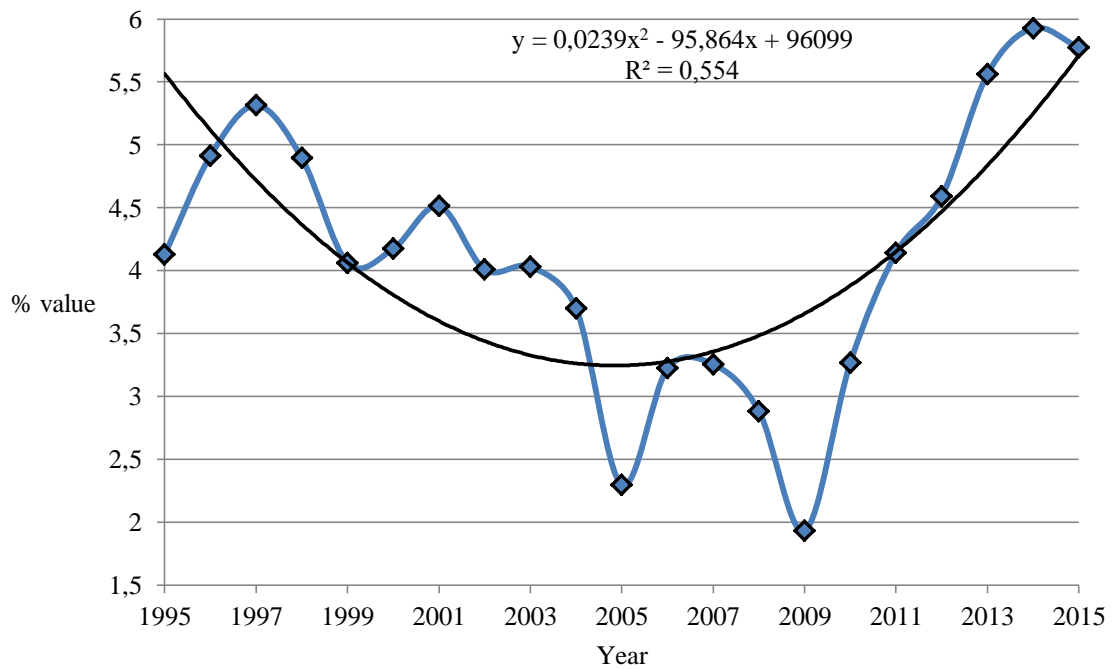
Figure 5
Annual growth of GDP in Cameroon (1995-2015, constant prices)
Source: World Bank, 2016
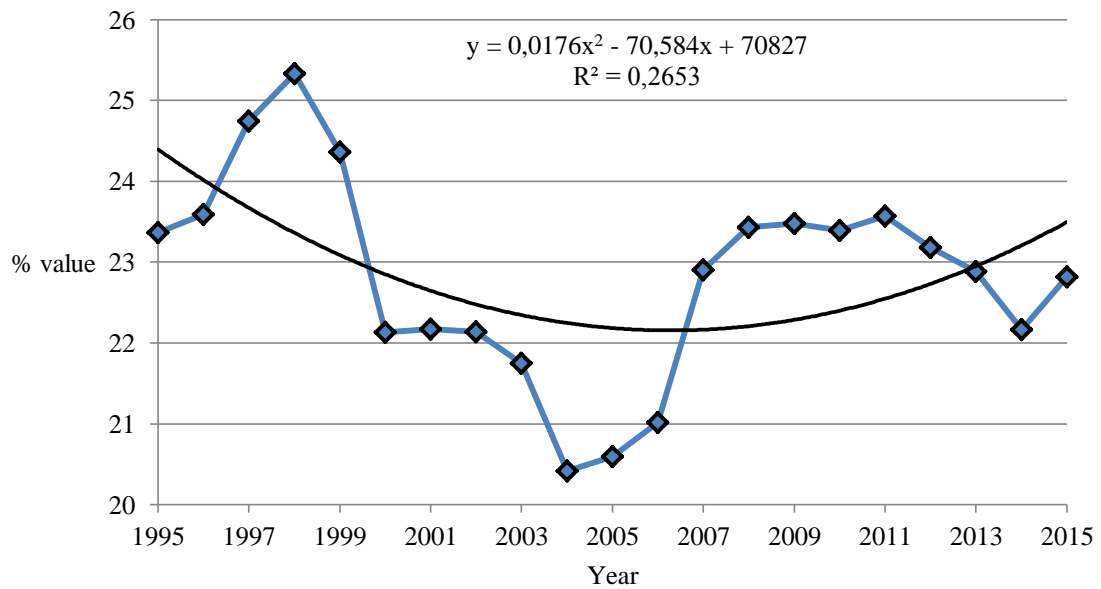
Figure 6
Annual growth of agriculture value added to GDP in Cameroon (1995-2015)
Source: World Bank, 2016

4.2   Study site description

For this study survey the capital city Yaoundé was selected. Yaoundé is located in Central province and is capital city of province as well. With total area of 68 953 sq. kilometres and number of inhabitants over 2,270,000 is Central province the second largest in Cameroon (CIA World Factbook, 2016). In whole Cameroon are present all African ecological zones due to climatic contrast. In Central province is common Tropical savanna climate and Tropical monsoon climate. Average rainfall in Yaoundé is 1,643 mm per year with bigger occurrence of rains during summer period and average year temperature 23.7°C (Pamo, 2008; Climate-data, 2016). Central province is divided in ten divisions: Haute-Sanaga, Lekié, Mbam-et-Inoubou, Mbam-et-Kim, Méfou-et-Afamba, Méfou-et-Akono, Mfoundi, Nyong-et-Kéllé, Nyong-et-Mfoumou and Nyong-et-Soo'o (Figure 7; Republic of Cameroon, 2016).
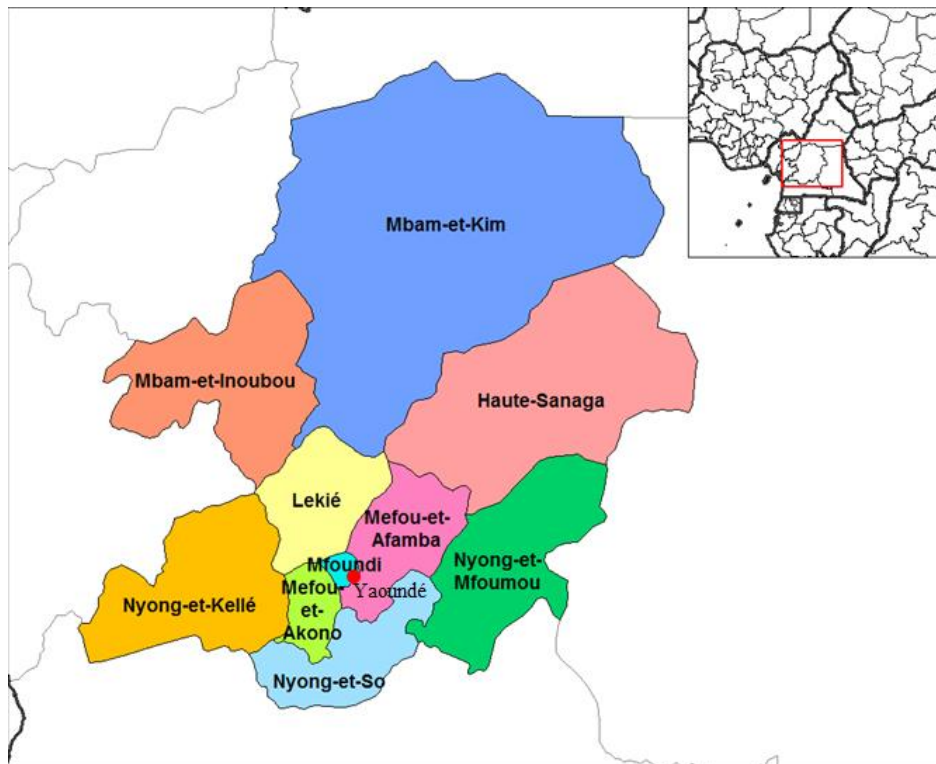
Figure 7
Map of Central province
Source: commons.wikimedia.org

In Yaoundé lots of markets are situated. The two biggest of them, Mfoundi and Mokolo market were selected for this work. Ruiz Pérez et al. (2000) created a scale of markets in Cameroon which was prepared base on their size and level of self-sufficiency. The first group is 'frontier markets', which are characterized with small to medium size of transactions and very high level of dependence of their supply from other areas. The second group is 'large urban markets'. Those markets may have a national projection due to their size and spread of linkages. Their level of self-sufficiency is very weak and they have to rely to large extent on more distant supply areas. Third group is medium-sized markets with importance on regional level with medium level of self-sufficiency. Their function is role of secondary nodes for small local markets and as intermediate assembly points for large urban markets. Last group of markets are small local markets. Their level of self-sufficiency is high because these markets operate as exchange places and supplier of regional and national markets.

Mfoundi market in Yaoundé belongs to category large urban markets (Figure 8), same as New Bell in Douala, which is the biggest market in Cameroon in size and offer of goods. Mfoundi market is a second largest market (Ruiz Pérez et. al., 2000; Elah, 2010). Mokolo market is in group of medium-size regional market.

Figure 8
Mfoundi market in Yaoundé
Photo by: author

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Yaoundé city was selected based on fact that in this city is possible to located more markets from different categories. Their comparison could be very useful for creating of value and market-chain in future studies.

4.3 Data collection

Literature review of the thesis was divided into two main parts. The first one was focused on information basic information about *Garcinia kola* and its importance in selected area, markets and financial income as well. The second one was description of markets and their relevance for scientific data collection and analysis. Information was collected through scientific databases, Web of Science and SCOPUS especially. Other sources were provided by supervisors and consultants.

Data for practical part were gathered through qualitative and quantitative methods. Qualitative method was based on semi-structured questionnaires, which were prepared in English and French language, quantitative by markets observation. For this study the main data came from 71 respondents interviewed during June and July 2016. In Yaoundé we did not have a chance to meet with producer of bitter kola so we focused on the traders. For data collection we selected two main target groups of respondents – street vendors and market traders. We prepared different questionnaires for both of groups and we surveyed them separately. Due to questionnaire we tried to establish their role in market-chain. Questionnaires were prepared in French and English and we use work of Elah (2010) as a basement. On survey I cooperated with Mr. Jean-Paule Effa who had role of my guide and interpreter.

4.3.1 Street vendors

Street vendors have important role in African big cities. Due to quick increasing level of traffic and lower places for parking are very important for drivers and travellers who are in hurry. They are mostly situated close to main streets, big crossroads and centre of the city, as well as close to markets were they mostly buy their supplies.

For our research we used transect walk during which we walked on the streets in different district of Yaoundé with increasing distance from city centre and choose the vendors who were sell the seeds of bitter kola. The selected vendor depended on the

approximately total number of vendors in concrete district. Total number of respondents from 4 districts is 36; respondents were from Post Centrale district (n=10 from 50 vendors we met), Madagascar district (n=10 from 20 vendors we met), Essombo 2/Terminus Miboman district (ETM; n=10 from 10 vendors we met) and Soa district (n=6 from 6 vendors we met). We visited each district separately and we used short time for habituation. During the research with street vendors we observed other NTFPs species offered by them as well.

The structure of questionnaires for street vendors contained multiply choices, asking either for one option or all that apply and dichotomous answer like Y (yes) or N (no). The questionnaire contained 19-21 questions (it was affected by the age and school activity of individual vendors) and time which was necessary to filled was between 10 and 15 minutes. Quit usually the situation happened that we spent more time with certain vendor because we have attracted attention by other people who came to us and joined to the discussion. We had benefits from these situations because this people were able to show us other place with new street vendor. For answers and time which vendor spent with us we bought small amount of bitter kola at the end of questionnaire.

For our final choice of markets we proceeded from the answers from street vendors, in their questionnaire was a question "Where they buy their supply". Most of them pointed Mfoundi and Mokolo markets. Questionnaire for street vendors is in Appendix A1 and A2.

4.3.2 Market traders

Markets where we choose our respondents were affected by answers from the street vendors. Except Mfoundi and Mokolo markets we also visited Central market and Soa market, which were pointed as well. However, small number of traders was no relevant for statistical analysis.

Questionnaires for traders (Appendix B1 and B2) contained 49 questions and time spent with one trader was between 25 and 30 minutes. These questionnaires we also used as a basement when we prepared questionnaire for street vendors. Willingness to respond was smaller than in case of street vendors. Total number of respondents from traders is 35; 20 from Mfoundi, 15 from Mokolo market. But total number of identifying traders

was bigger. In Mfoundi market we identified 27 traders and in Mokolo 22. Problem of these unwillingness traders was maybe in market distribution. These markets are divided in section based on selling products, e.g. NTFPs, bananas, meat, etc. When we tried to discuss with one trader, other were observing us. In case that trader was able to cooperate with us, other did not have problem cooperated with us as well. In the opposite case we lost opportunity to discuss with the traders around that one.

The survey was mainly during forenoon because the number of buyers was smaller than afternoon. However, we visited markets twice in evening because it was recommended to us that the biggest wholesalers and middleman are occurring in the markets at evening. Unfortunately we were not able to identify anyone from these groups.

4.4   Data analysis

Data gathered from the respondents were analysed via descriptive statistics, such as means, standard deviation and frequencies. MS Office Excel version 2010 was used for data ender and coding, as well as for generating descriptive indicators.

5 Results

In this chapter are present the results of the selling of bitter kola in Yaoundé city. Research started with street vendors who identified the most frequent and supplied markets in Yaoundé. Results describes traders as well as their knowledges about bitter kola, other is focused on bitter kola itself, such as price, unit of measurement for buying or selling and its flow from different regions to Yaoundé. The described markets are Mfoundi and Mokolo. Other two markets, Centre and Soa were not included due to low number of respondents.

5.1 Street vendors

5.1.1 Street vendors characteristics

Out of our 36 respondents who participated in our survey on the streets and claimed to be involved in bitter kola sales, 24 could be classified as street mobile-vendors (66.6%). This type of vendors was in majority in three out of four districts where our study was conducted. Beside one 41-years-old female vendor, all of them were men – one of them was 51-years-old but rest of mobile-vendors had average age equal to 15.6 years (± 3.16; Table 2) and had short time experience with selling. These men vendors were predominantly students (95.6%; Figure 9) who were selling bitter kola in the time of summer holidays in order to generate adequate cash to pay tuition fees for the upcoming academic year (which is equal to 20,000-40,000 CFA based on region and city size). Two of these students vendors (9.1%) were selling bitter kola seeds even during the academic year, but not in the time of lectures. Majority of these vendors used to sell bitter kola on a daily basis, however particularly during the time of holidays, state holidays and other free days when regular teaching activities are cancelled. Number of street mobile-vendors is increasing with longer period of day which is reason of lower chance to meet a policeman. The biggest number of street mobile-vendors is around 6 p.m. However, the willingness to answer on the questions was decreasing with time due to bigger number of customers. Number of street vendors was lower in weekends and these who were selling during it provided bigger profits. Besides bitter kola seeds, kola nuts (*Cola acuminata*) were very popular product which could be easily found among 92% of targeted street mobile-vendors. Other product is jujube (*Ziziphus jujube*),

which was offered by 46% of street mobile-vendors and important products were citruses as well, sold by 38% of street mobile-vendors. Compare to bitter kola or kola nut, which are bitter, citruses were sold as refreshment. Last product which was quiet often was "lion kola". Lion kola is a mixture of minced bitter kola and spice and is use as appetizer or for chewing. This mixture was found in 21% of vendors. Generally, number of products in case of mobile street vendor was limited by size of plastic bowl which was practical tool because it was not limit a vendor in moving in rush hours among different means of transport because they were situated close to main streets and roads in the city. Street mobile-vendors attracted their consumers due to their mobility and location on the streets. Thanks to this, 79.2% of them confirmed that taxi drivers and their customers were the most common consumers purchasing bitter kola from them, whereby the taxi drivers were adult men only. Number of females or children who could be considered as potential purchasers of bitter kola products was low (37.5% females and 8.3% children).

Table 2 Socio characteristics of the street vendor respondents (n=36)

	Street mobile-vendors	Street vendors with stall	
Number	24	12	
Percentage (%)	66.7	33.3	
Number of traders in districts			Total number of identified vendors
Post centrale	8	2	50
Essombo 2, Terminus Miboman	8	2	10
Madagascar	7	3	20
Soa	1	5	6
Average number of selling products	2	4	
Variable	% response	% response	
Gender			
Male	96	41.7	
Female	4	58.3	
Age			
< 20	79.2	8.3	
20 – 40	12.5	41.7	
> 40	8.3	50	
Marital status			
Single	100	41.7	
Married	0	50	
Widow	0	8.3	
Education level			
Primary	16.7	33.3	
Some secondary	50	66.7	
Finished secondary	33.3	0	
Never gone to school	0	0	

Stall-holders (vendors with a stall) represented the second group of street vendors. Compare with mobile-vendors, stall-holders were fix on one place. However, they were able to switch their position daily. The number of stall-holders represented 33.3% of respondents in our research. In case of this group the distribution was almost equal, 58.3% of stall-holders were women with average age of 38.5 years (±7.56) and 42.7% were men with average age of 35.8 (±18.89).

Figure 9
Young boy as a mobile street vendor during summer holidays
Photo by: Jean-Paul Effa

The biggest number of stall-holders was situated in Soa district, where they formed 83.3% from all respondents. This district was furthermost from centre of Yaoundé and all vendors here were located close to bus station. Increasing number of stall-holders correlated with increasing distance from city centrum and main streets as well. Number of products in stall-holders was bigger than in mobile-vendors. In case of street mobile-vendors was average number of other selling products 2 and in street vendors with stall 4. Compare to mobile-vendors portfolio of stall-holders was much more variable as well. It was more diverse and products structure offered by them did not reflect seasonality of agricultural production or wild products collection only such as in the case of street mobile-vendors (Figure 10). Except kola nuts (66.7% of stall-holders) were the most frequent commodities alcohol (42%) and candies (66.7%). However,

variability of products was probably affected by locality of stall and availability of different products there. Next to bitter kola were usually situated washing powders, batteries or vegetables. Most frequent customers of stall-holders were either adults without any specific clarification (41.6%) or all age groups of customers (58.3%). All stall-holders were able to selling every day, including weekends.

Figure 10
Comparison of bowl of mobile-vendors
a) with bitter kola (small and light brown), kola nuts (pink with dark skin) and jujube (on the top) and stall of stall-holder
b) with tissue, alcohol, candies, bitter kola and kola nuts
Photo by: author

5.1.2 Buying and selling of *Garcinia kola* by street vendors

Main reason which affected the price of bitter was a season. In time of non-seasonal period the price of bitter kola could be 50%-100% bigger than in seasonal period due to lack of seeds. Nevertheless, 88.8% of respondents claimed that they had possibility to buy bitter kola seeds during whole year. Rest of respondents (11.2%) said that availability of bitter kola was in period from June to September. In summer period (June-September) 27.8% of street vendors had the biggest profit from selling, lower number (22.2%) was able to sell the biggest amount of bitter kola in period from September to December and 19.4% of street vendors said that the best period for selling bitter kola seeds is from January to May. Rest of respondents (30.6%) did not see any

impact of period on the level of sale. Interesting fact was that price of bitter kola on streets and markets were fixed and affected by bargaining only during buying of big amount.

Units of measurement of buying of bitter kola depended on the individual street vendor and his preference of bitter kola compare to other selling products from offered portfolio and how bustling was the locality where he occurred. Bigger amount of bitter kola was easily possible to find in street mobile-vendors compare to stall-holders because for stall-holders bitter kola was usually not main source of income. This affected the amount of purchased goods during the period of time. Most of street mobile-vendors (71%) bought new supply every day, compare to stall-holders among them only 50% bought every day. However, both groups were buying in same units of measurement. The most frequent units which were street vendors for buying were by pieces (27.7%), 5 litter volume bucket (25%), half of 5 litter bucket (13.8%), one bowl (it means that trader let fill bowl of street vendor and after that calculated final price, 11.1%) and 15 kilograms (8.3%). Average price which street vendors spent daily for bitter kola in all four districts was 2,738 CFA (4.17 €) and average profit from selling was 4,161 CFA (6.34 €, FXTOP.com).

Except Madagascar district vendors were able to sell their goods with profit (Figure 11). 100% of street vendors sold bitter kola for pieces with average price 50 CFA (0.08 €) per piece or number of pieces, usually 3 per 100 CFA (0.16 €). The price was same in all street vendors and was not influenced by element of size or visible characteristics, such a colour. However, the vendor was usually responsible for the selection of seeds. Considerable influence on the profit had price of selling product and its fixing mechanisms. Street vendors in Yaoundé considered main four fixing mechanisms. 69.7% of street vendors considered their price by purchasing price, 20.9% of them mainly used price which was practiced by other street vendors in district while 4.7% considered the influence of costs expenses and same number (4.7%) calculated price by potential number of clients in particular day.
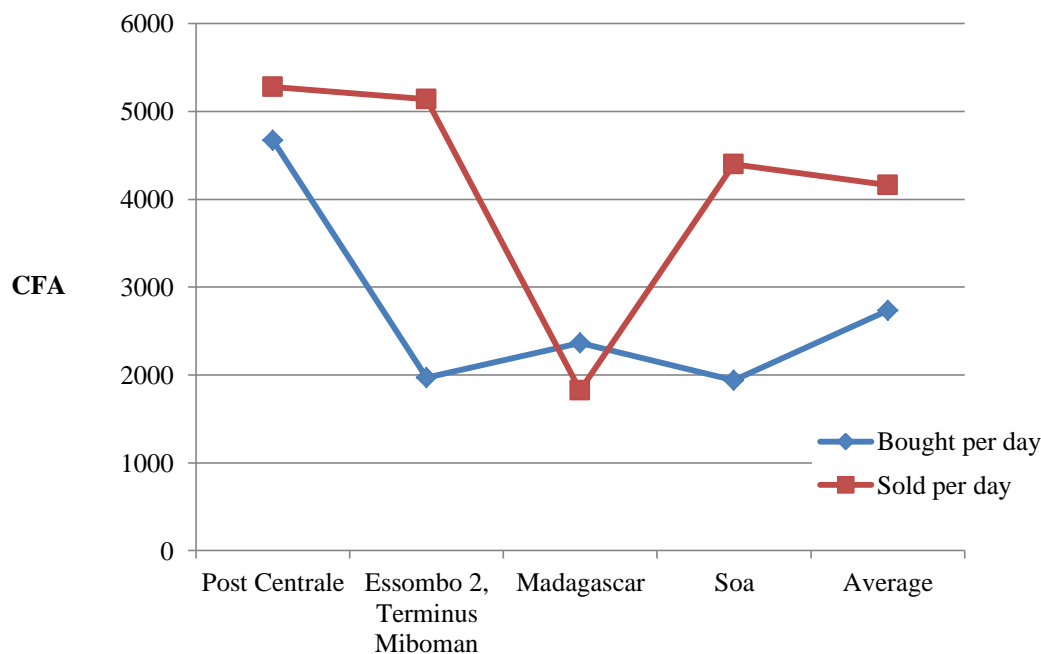
Figure 11
Average costs and profits per day in four districts in Yaoundé

Pointed above, most of the street vendors were young boys, students usually, without regular financial income. Therefor they had to have initial source of finance for which they could buy bitter kola. The biggest number of respondents (34.1%) said that financial support came from family members. 22.7% earned money from selling of bitter kola or selling other products from their portfolio (same number of respondents), 11.4% used for the buying their personal funds. Rest of respondents (9.1%) used help from a loan association – tontines. Tontines are associations which bring together people from one community from reason to help each other. Each member of group adds certain amount of money to common source of money. If one member of community needed financial help, other will provide him appropriate amount of money. Debtor is going to return amount lent after specific time with small interest rate. This form is more prefer than loan from bank.

5.2 Market traders

5.2.1 Market traders characteristics

We observed that bitter kola sellers in Mfoundi market were scattered in the whole size of market because they were selling wider range of products compared to Mokolo

market where bitter kola traders had their own specialized sections. There were a lot of bitter kola street vendors at Mokolo market, street mobile-vendors who were walking through the market as well as stall-holders with their stationary shops. All of them were situated on the streets around the market. In both markets all traders offered other products than bitter kola in their portfolio. In Mfoundi, average number of offered products was 2.90 (±1.09), which means less than in Mokolo 3.73 (±1.29). The most often offered products on both markets were kola nuts (85.7%), jujube (28.6%) and lion kola (28.6%). On Mfoundi market were traders more focused on fruit species, e.g. mango (*Magnifera indica*, 20%), citruses (20%), safou (*Dacryodes edulis*, 15%) or soursop (corossol, *Annona muricata*, 10%) and on Mokolo on coconuts (*Cocos nucifera*, 20%) and tree bark which was common used as spice or treatment for diseases (20%). These products were not offered by traders of bitter kola from opposite market.

Compare to street vendors were market traders very experienced with selling, average selling activity on Mfoundi was 13.75 years (±6.85) and on Mokolo 9.39 (±7.58). Main reason why traders started with bitter kola business was the prospect of high profit from selling (80%), family history was pointed by 11.4% of respondents and a conviction that bitter kola is not affected by diseases (5.7%). Based on answers to question were traders classified as pieces of market-chain of bitter kola. The biggest number of respondents identified themselves as retailers (62.8%). Wholesaler-retailers were 34.3%, reason of this classification was because they bought goods from other traders and sold it as well. During whole survey we identified only one wholesaler (2.9%) who was simultaneously collector and harvester (she paid for harvesting of tree). Role of collector mentioned one of trader with wholesaler-retailer position as well.

Three out of 35 traders (8.6%) were farmers who cultivated bitter kola trees. However, no one sold their own goods. During our survey we were not able to find out the reason of this. All traders on both markets used for selling places offered by market. From all market traders 77.1% used this places permanent, for 22.9% was their position temporary and wanted moved to better area with bigger opportunity for selling. Nevertheless, all traders paid market fees (200 CFA per week in Mfoundi and 1,000 CFA per week in Mokolo). From other fees, traders in Mfoundi paid 200 CFA per day for electricity in part in the centre of market and in Mokolo 500 CFA (0.76 €) per week

for security services. Last, but not least, pay taxes to markets which are 1,000 CFA (1.52 €) per month in Mfoundi and 1,667 CFA per month in Mokolo.

5.2.2 Buying of *Garcinia kola* by market traders

Units of measurement for buying in market traders were bigger than in case of street vendors. Lowest bought amount was usually half of 5 litter bucket with average price in Mfoundi 5,750 CFA (seasonal average price, 8.77 €; in non-seasonal period 8,000 CFA, 12.20 €) and 6,875 CFA in Mokolo (10.48 €; in non-seasonal period 9,000 CFA, 13.72 €). In this unit of measurement bought 11.4% of traders. Their profit from selling of bitter was usually smaller compare to traders who bought in bigger units of measurement and relied on the profit from other products. 60% of traders bought bucket about 15 litter volume with average price 16,890 CFA in Mfoundi market (25.75 €, in non-seasonal period for 30,218 CFA, which is equal to 46.07 €) and 34,125 CFA in Mokolo (52.02 €, in non-seasonal period for 55,625 CFA, which is 84.80 €). 77.1% of traders bought new supply of bitter kola daily, 20% weekly and 2.9% monthly. Daily spent for new supply of bitter kola was 18,550 CFA in Mfoundi (28.28 €) and 31,167 CFA (47.51 €) in Mokolo. The biggest unit of measurement which traders bought was 100 kilogram bag which average cost was in Mfoundi in seasonal period 200,000 CFA (304.90 €, in non-seasonal period 260,000 CFA which is 396.37 €) and in Mokolo for 275,000 CFA (419.23 €, in non-seasonal period for 300,000 CFA which is 457.35 €). Financial sources of traders were 46.4% from selling of bitter kola, 42.9% from selling of other products from their portfolio, 7.1% from tontines and 3.6% from family members. The certain means of transport such as possibility of self-supply was pointed by 31.4% of traders. These traders used transport weekly in 36.4% of them or monthly in 63.6% and price for it was affected by the amount of seeds. Availability of seeds from traders sources was during whole year for 48.7% of respondents, 20.5% were able to buying in period from May to September, 18% in period between September and December and 12.8% from December to May.

Main aspects which traders considered before the purchase the seeds were from 26.7% fresh condition of the goods, 24.1% preferred seeds with skin and 21.5% had size as a main reason for buying. Other characteristics, such as colour (10.3%) and taste (5.2%) were in minority. Traders believed that for clients were the most important aspects from

57% fresh condition of the goods, 16.7% if the seeds had skin, 13.2% size of seeds, 8.8% colour and 4.3% taste.

5.2.3 Selling of *Garcinia kola* by market traders

Selling frequency of traders was all year round with daily activity (68.6%), all year round with weekly activity (11.4%) or in seasonal period only (20%). Traders were usually selling on one market only (88.6% in Mokolo, 100% in Mfoundi market), low number of traders (11.4%) was able to sell on other market. Pointed markets were Mfoundi (28.5%), Edjo (14.3%), Elig (14.3%), Etoundi (14.3%), Muong-bi (14.3%) and Sue (14.3%). Majority market traders were women (86%; Table 3) with average age 49.9 years (±9.92).

Table 3 Socio characteristics of market traders

	Mfoundi	Mokolo
Number	20	15
%	57.1	42.9
Total identified number	27	22
% of rejecters	26	31.8
Number of selling products	2.9	3.73
Variable	% response	% response
Gender		
Male	10	20
Female	90	80
Age		
< 20	0	0
20 – 40	20	40
> 40	80	60
Marital status		
Single	45	20
Married	50	73.3
Widow	5	6.7
Education level		
Primary	40	40
Some secondary	45	46.7
Finished secondary	10	6.6
Never gone to school	5	6.6

Traders in Mfoundi market were able to attain profit from selling of bitter kola seeds in ration bought per day/sold per day than traders in Mokolo market. Average daily profit of all traders in Mfoundi market was 29,300 CFA (44.67 €) and 33,850 CFA (51.60 €) in Mokolo market (Figure 12). Based on answers of respondents in Mfoundi market was profit 10,750 CFA (16.39 €) which was considerably different compare to 4,550 CFA (6.94 €) in Mokolo market.
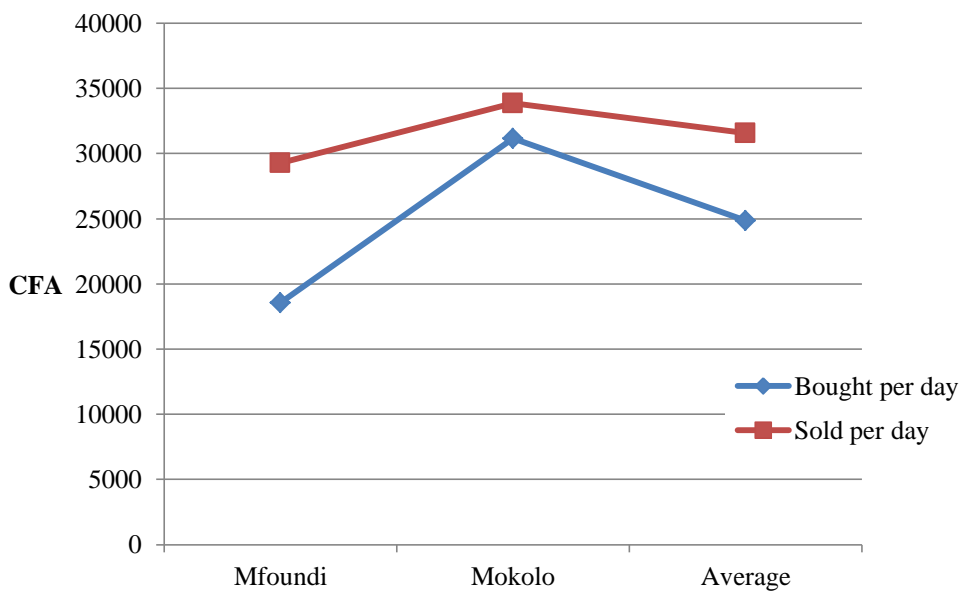
Figure 12
Average costs and profits per day in Mfoundi and Mokolo markets

Common unit of measurement for selling was a cup (Figure 13), which price was equal to 500 CFA (0.76 €) on both markets. However, the average amount of seeds was different. In Mfoundi one cup contained in average 35.3 and in Mokolo 25.4 of bitter kola seeds. With this unit of measurement operated 94.3% of vendors in both markets.

Figure 13
Common selling unit by market traders – cup

Other units, e. g. buckets with volume 2.5 l, 5 l or 15 l, bag or pieces where used based on type of consumer and were observed occasionally, generally at bigger traders. Moreover, large range of prices were detect not only between markets but also between individual traders in one market. Figure 14 shows differences between selling and buying prices in Mfoundi and Mokolo markets in most frequent units of measurement. The main factors which were considered by traders during the price fixation were for 78% of market traders purchase price, 14.6% calculated with cost expenses and 7.3% mainly observed price which were practiced by other traders.
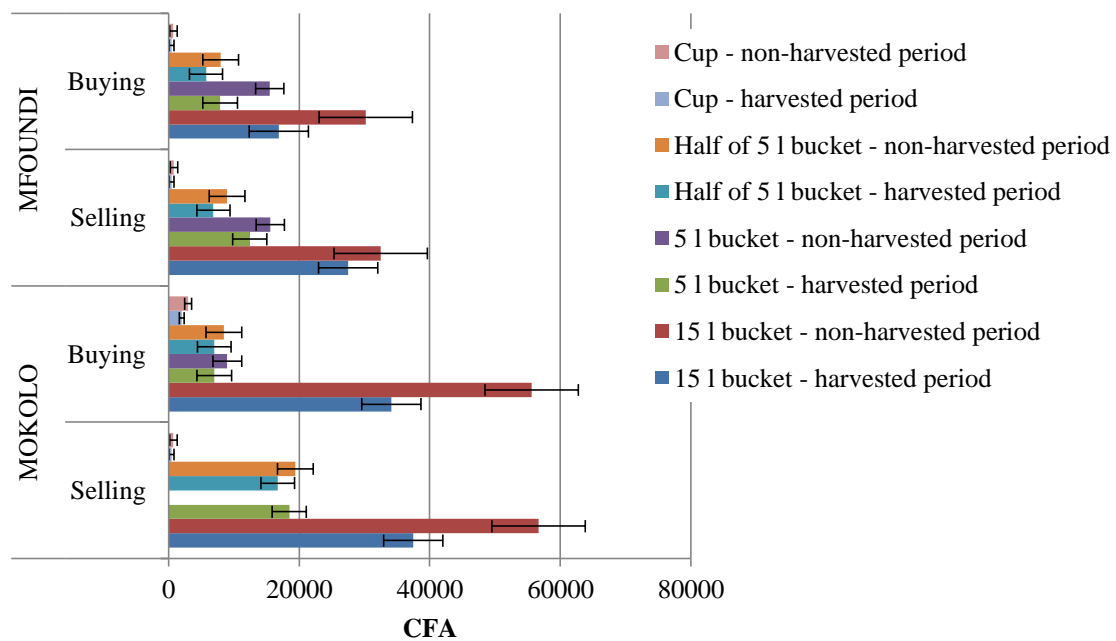
Figure 14
Comparison of common units of measurement for buying and selling in Mfoundi and Mokolo markets (with standard deviation).

Majority of traders (91.4%) admitted certainly percent of losses of bitter kola. However, trades were not able to tell any number which could clarify approximately percent. Reasons of losses were often individual by traders, but quite often were pointed stealing (28.6%), lack of trading opportunity due to big competitor (22.9%), problem to sell all amount (20%) and fact that seeds can go rotten (14.3%). No one from traders had any prevention against losses which were commonly bigger in seasonal period due to bigger number of traders and overabundance of bitter kola seeds.

The biggest problem for traders was with the storage of seeds; this was problematic for 25.7% of all respondents. Due the fact that bitter kola is going rotten were traders with bigger amount of its seeds in big hurry with selling. For traders with transport possibility (31.4%) was problem the transport price, which was affected by season, distance, type of transport and amount of products. For this reason several traders from distanced area (e.g. Bamenda) cooperated. Number of traders (usually women) bought bigger amount of bitter kola as group and travelled to market. There they divided whole amount to smaller parts for each member of group. Each trader from group had specific amount of goods and at the end of sales put profit together with other members. If one of the traders was finished earlier she was able to help another member. One main member was responsible for selling and at the end she divided profit among all traders. This system of travelling was quite often in Mfoundi market. For all traders were profits from selling of bitter kola seeds very significant source of income for the households. However, we were not able to find out the final value which traders considered to be profit for the family.

5.3   Common knowledge of vendors on *Garcinia kola* use

Main reason for selling of bitter kola was, beside big selling potential, its medical ability. One part of our research was focused on knowledge of these abilities among sellers. From all 71 respondents were 88.7% absolutely convicted of medical ability of bitter kola, 5.6% were sceptical about this type of information, 2.8% did not believe at all in that and same number of respondents did not know anything about this problematic (Figure 15).

Common fact was that bitter kola is used as a treatment against stomach problems or bronchial problems. This was confirmed when 51% of selected answers were that is able to used it as cure of stomach problems (Figure 16). Nevertheless, 16.4% of respondents believed in aphrodisiac ability of bitter kola seeds. This fact was pointed mostly by market traders especially when they explained the reason of purchase by men consumers.
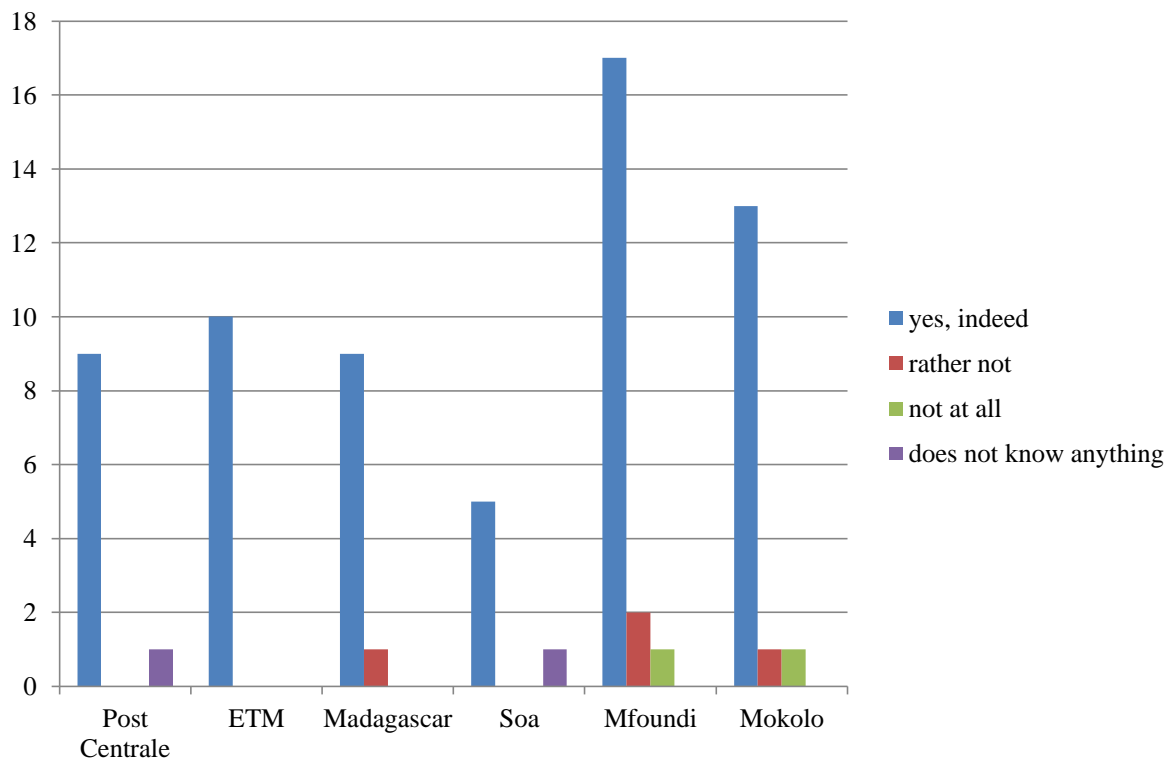
Figure 15
Confidence in medical ability of bitter kola seeds by street vendors and market traders in Yaoundé
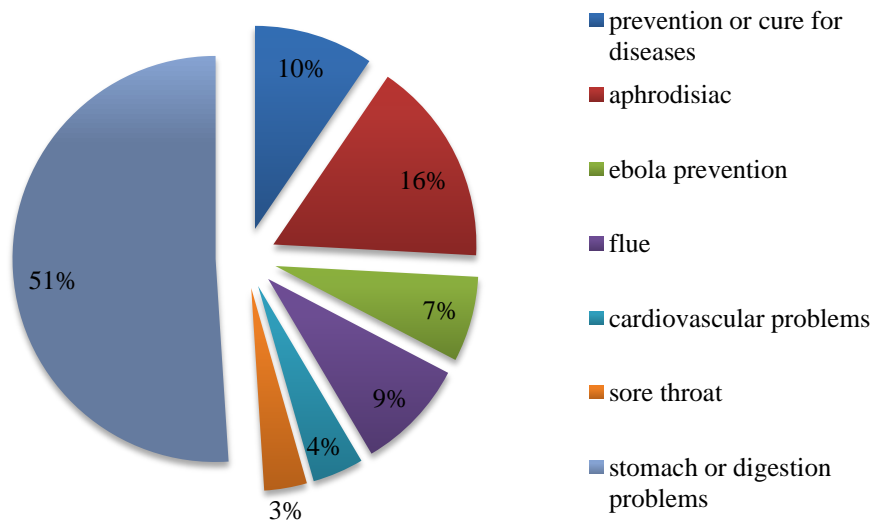
Figure 16
Pointed medicinal ability by traders and vendors in all localities

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5.4 Market-chain, traders and seeds origin analysis

In case of buying of bitter kola, 86.1% of mobile-vendors preferred buying in Mfoundi or in Mokolo markets and their preference depended on the distance of the market from actual district of Yaoundé. From respondents who were markets favouring only 6.4% of them have mentioned that buying on both of these markets. Village against markets favoured 13.9% of respondents, and named villages were Nkossamba (50%), Dschang (16.6%), Eseka (16.6%) and Moungo (16.6%). Reasons of preference of village against market were low price, access to the goods or place of origin of vendor. Street vendors mostly bought bitter kola from collectors (56.1%) or wholesalers (26.8%), lower representation had farmers (9.8%) and farmers+collectors (7.3%).

Buying preferences of market traders were usually linked with market where they were selling. Mfoundi or Mokolo were used as place for buying by 88.6% of market traders, but 9.7% from them bought goods also in the villages from time to time. Villages where traders bought bitter kola were Dschang (36.4%), Saa (13.6%), Bamenda (9.1%, city with own market), Bafia (4.5%), Bali (4.5%), Bassa (4.5%), Ebogo (4.5%), Eseka (4.5%), Etuku (4.5%), Mamfe (4.5%, city close Nigeria borders), Mbamkouop (4.5%), and Yoko (4.5%). Moreover, one respondent bought bitter kola directly in Nigeria. A person from whom traders bought goods was mostly collector (53.5%) and farmers-collectors (20.9%), farmers represented 18.6% and wholesalers 7% of responses. Figure 17 shows buying preferences by both groups of sellers.

Moreover, trade with bitter in markets was affected by selling markets traders who were selling among each other. Main clients who were buying bitter kola from traders were consumers (35.6%) but other clients were retailers (28.7%), wholesalers (18.4%) and wholesalers+retailers (17.2%). The opportunity to sell goods to bigger merchant was mainly used in case when traders had overabundance of seeds which were not able to sell by themselves. However, usually traders wanted to sell their goods alone because of bigger profit. Market-chain of bitter kola seeds is strictly affected by role of collectors (Figure 18), but except few exceptions vendors or traders were not able to determine place of origin of their bitter kola seeds.
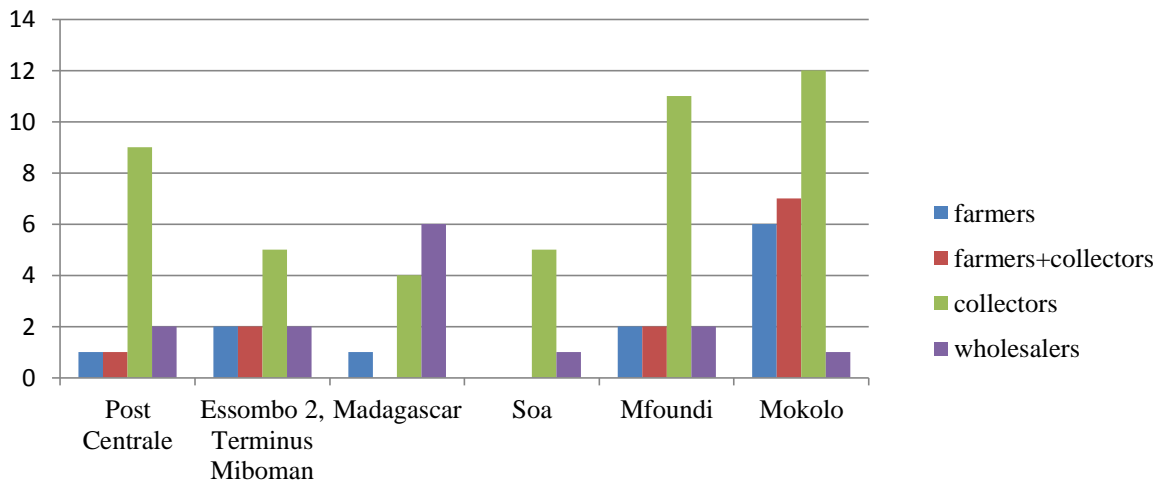
Figure 17
Source of *Garcinia kola* for sellers in Yaoundé city
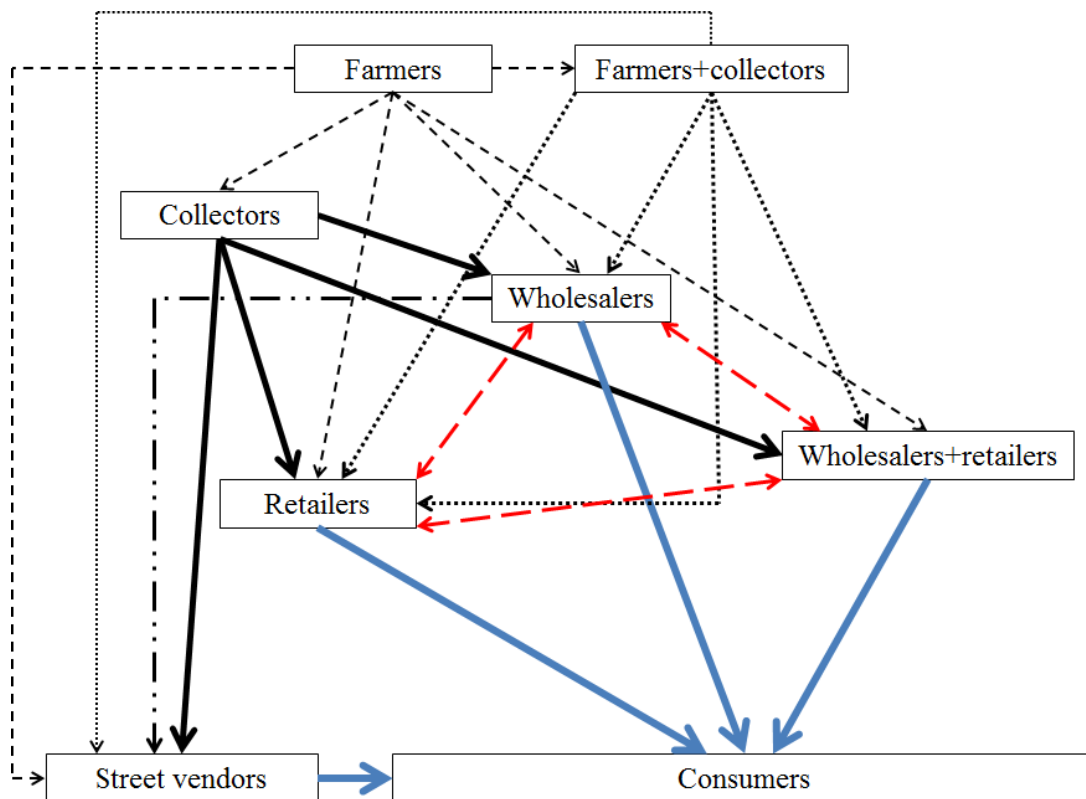
Figure 18
Identified market-chain in Yaoundé city

Majority of sellers of bitter kola seeds arrived in Yaoundé from different parts of Cameroon. In case of street vendors we found out that majority of them (75%) came to

Yaoundé from West province, 24% from Central province, and 1% did not provide their origin. This showed fact that lot of people see the opportunity of business in big city despite the fact of long distance and traffic expenses. However, problem was with closer identification of cities or villages of their origin, from West province we identified Nde village only. Respondents from Central province pointed Kombe, Lekie, Makak, Mfu, Nkométou I. while one trader was from Yaoundé city. Similar situation was with market traders where majority of them were from Central (48.4%) and West region (22.6%). From North-West were 9.7% of traders, 6.5 % from Litorral and 3.2% from East, North, South and South-West province. Market traders were also more informative about their origin and pointed Ebebda, Ebogo, Maboen, Mbam, Mbam-et-Inoubou, Mefou-et-Afamba, Obala and Yaoundé from Central, Baffousam, Bamendjou and Dschang from West, Bamenda city from North-West, Bassa from Littoral, Boudé from North, Ebolowa from South and Idenau from South-West province (Figure 19 a).
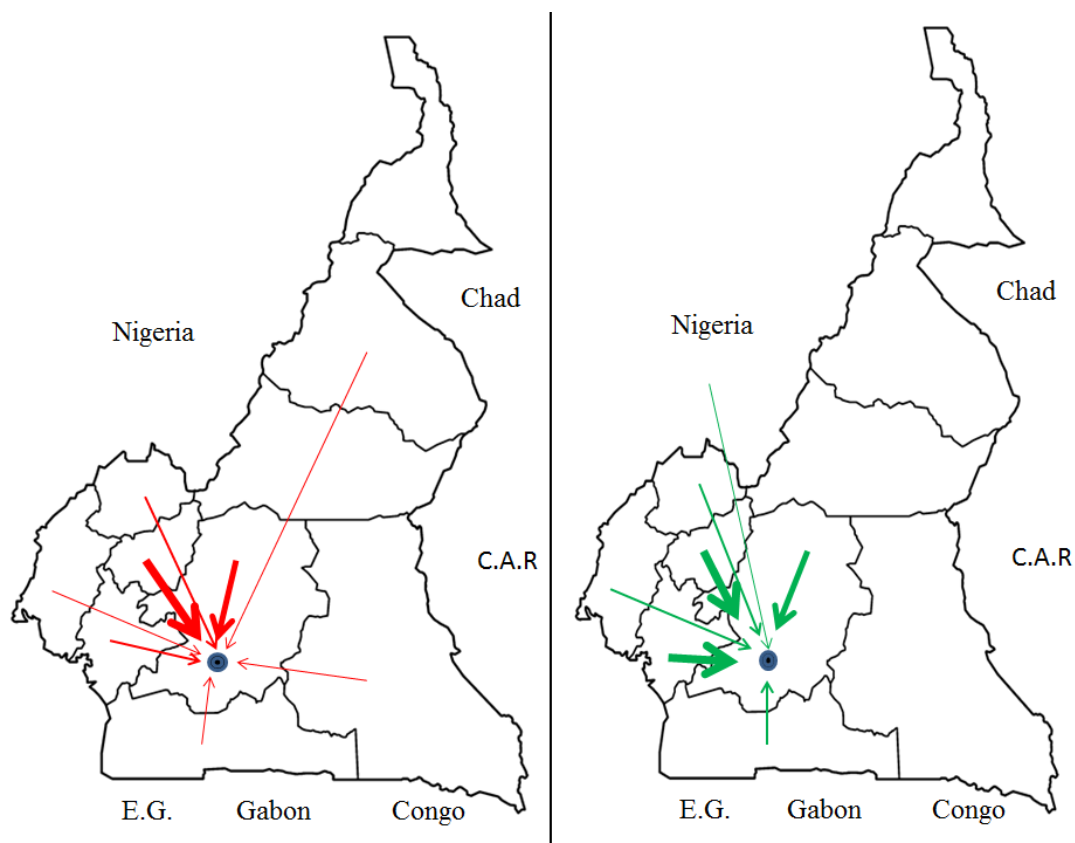
Figure 19
a) Origin of vendors and traders by regions **b)** Regions where bitter kola was bought before arrived in Yaoundé
Based on Agea et al., 2008

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Number of traders or vendors pointed localities where they bought their goods. In these answers prevails representation of West province (25%) with villages Dschang and Mbamkouop, and Littoral province (25%) where pointed localities were Bali, Bassa, Moungo and Nkongsamba. In Central province (20.8%) source of bitter kola seeds were Bafia, Ebogo, Eseka and Yoko. North-West, South, and South-West provinces (8.3%) were traders able to buy seeds in Bamenda (N-W.), Saa (S), Etuku and Mamfe (S-W) (Figure 19 b). Bitter kola seeds from Nigeria represented 4.2%. More places with occasions to bought bitter kola were not mentioned.

6 Discussion

During our survey we discovered that majority of traders (86%) of bitter kola in both markets, i.e. Mfoundi and Mokolo, were women, which corresponds with the previously published theory (Nzemen, 1993; Ndoye, 1997). Moreover, there are other authors who stressed big involvement of African women to trade with NTFPs in their studies (Awono et al. 2010; Chigbu et al. 2011). However, literature neglects the role of adolescent street men mobile-vendors and their connection with the market-chain of bitter kola. Based on our findings, these boys may be a promising source of useful information about the consumers' preferences towards bitter kola or for better understanding of bitter kola market-chains in Cameroon as they seemed to be following the flow of seeds from collection places to markets. Market-chain analysis uncovered strong role of collectors of bitter kola who could be considered as a main actor influencing the supplies of seeds to markets. Additionally, it seems that gradual maturation of seeds in different provinces had no negative effect on a selling frequency at markets in Yaoundé. This was probably due to certain storage possibilities of wholesalers or collectors, who were mostly responsible for transportation of bitter kola seeds to markets in Yaoundé city. Street mobile-vendors usually purchased all seeds from focused markets in Yaoundé and further sold to their specific consumers, taxi drivers and their clients. Correspondingly, stall-holders purchased all their production from other market-chain nodes presented at focused markets. Market-traders partly supplied their stocks (roughly 10%) directly in the villages from collection areas. This situation resulted in a strong interaction, e.g. selling seeds one to each other, among individual sellers of different type, particularly in the period of overabundance when namely smaller retailers failed to successfully sold all their stocks.

Prices were also influenced by local units used by all vendors and was also determined by period of abundance. Eyog-Matig et al. (2006) documented the selling price between 25 and 75 CFA per one seed, however based on our findings, vendors used different selling units, such as 3 pieces per 100 CFA (0.16 €) particularly on the streets and occasionally in market (particularly Mokolo) and cups (≈150 g), very commonly used on markets with common price 500 CFA (0.76 €) for each. The price was mainly affected by harvesting season and, of course, abundance of seeds. Fact that both market

traders and street vendors were selling seeds at the same price and unit pointed at the situation that they all were typical price takers with only limited impact on final price. This situation was observed on both markets and all districts. Nevertheless, several market traders were selling seeds also in buckets with different volumes, i.e. 2.5 l, 5 l and 15 l. Prices for each volume differed from vendor to vendor, very probably due to the either higher quality of product or, more probably, because of different prices from previous nodes in the whole chain. This is in correspondence with other studies documenting significant impact of collecting and selling of bitter kola on famers' income ranging from 310 to 1,170 US$, which represented 0.85-3.21 US$ (0.91-3.44 € in 2000) daily income, in five different provinces in Cameroon (Foundoum & Tiki Manga, 2000). Similar results were observed in neighbouring Nigeria (Onyekwelu et al., 2015).

Majority of all interviewed sellers (88.7%) were convinced about the efficiency of their products in terms of medicinal purposes. More than half of them (51%) acknowledged particularly use of bitter kola seeds as prevention against stomach and digestive problems, correspondingly to the study of Adodo (2000). Using the seeds as aphrodisiac or sexual stimulant was documented among 16% of vendors. This prevalence is nevertheless lower compare to other publish studies that observed almost 100% prevalence of using seeds in this part of world as an aphrodisiac and/or chewing them for the purpose of stimulation and refreshment, and ten percent of population also perceive bitter kola seeds as efficient cure against poison (Foundoum & Tiki Manga, 2000; Dimelu & Odo, 2013). Bitter kola can be used as chewing stick as well (Indabawa & Arzai, 2011), which would explain the frequent buying from taxi drivers. No interviewed seller mentioned any religious or cultural importance of bitter kola, which was documented by other studies (Sheldon et al., 1997; Terashima, 1999). This knowledge seems to be however very common among farmers from collection areas, such as in Southwest province, which was observed during field trip. The use of bitter kola is in a certain level influenced by local cultural habits and values, which was difficult to observe at markets in Yaoundé.

Despite the current poor quality of Cameroonian roads, our research showed high number of sellers from different provinces, especially from West, Central and Littoral.

These people moved to Yaoundé with the vision of easier and higher profit compare to rural markets in villages or smaller cities back in provinces. This corresponded with the origin of bitter kola seeds, which come to Yaoundé from these provinces as well. This finding could identify challenges for future research in order to document if the seeds really originate in the forests, into what extend the production from homegardens is commercialized, what proportion is purchased at local small markets or, whether the seeds would be transported from other areas of the country or even from abroad.

Our study is not without limitations. One of the main problems was that during June and July, when the survey was created, the main season of bitter kola in Central region was already almost gone. It could be the reason why the number of traders of bitter kola was much lower than expected. Compare to other studies which considered more different markets in different socio-economic conditions (e.g. Nguyen, 2006; Vlková et. al., 2015) we did our survey in one city only (Agea et al., 2008). Despite the fact we covered two different markets and four districts of Yaoundé city, any interpretation of our results must reflect this fact. Also unwillingness of the vendors to participate in our survey has to be mentioned although majority of them cooperated. Last, but not least, markets outside Yaoundé seemed to be worth of investigation as well. Particularly the biggest market in Cameroon, New Bell situated in Douala city, would represent an important source of data as well.

7 Conclusion

Our survey documented that there were two types of typical sellers of biter kola seeds, i.e. street vendors and market traders. Street vendors could be further divided into two sub-groups, e.g. street mobile-vendors and stall-holders. Street mobile-vendors were typically young boys selling bitter kola to taxi drivers on the streets in average amount of three seeds per 100 CFA. Street mobile-vendors occurred close to main roads through the city, on the big crossroads and bus stations as they could easily attract potential consumer at these rush localities. With the increasing distances from such high places, the number of mobile-vendors decreased, continuously replaced by female stall-holders who also sold three seed per 100 CFA. On the other hand, number of market traders corresponded with the main harvesting season of bitter kola. They were again predominantly women with a wide range of consumers who bought mostly a cup of bitter kola seeds per 500 CFA. Most of sellers were convinced that consumers were buying bitter kola mainly because of its medicinal abilities against digestions disorders or as a sexual stimulant. It is believed that particularly taxi drivers used seeds as a caffeine substitute as well. Generally, selling of bitter kola seeds seems to be profitable business for sellers as very probably for all members of the whole market-chain.

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Appendix A1: The questionnaire for street vendors (English)

Questionnaire: Market survey of *Garcinia kola* (seeds) – street vendor

Market information (collected individually by researcher)

Location (city, district, GPS): _____ Date (DD/MM/YY):_____

1. Where do you buy? ☐ at market → which market _____

☐ at farm level (villages) → In which village(s)? _____

How far from city? _____

In which village do you prefer to buy? _____

Why there? _____

☐ other _____

2. From whom do you buy? ☐ farmers ☐ farmers + collectors ☐ collectors ☐ wholesalers

☐ other _____

3. Selling frequency: a.) all year round ☐ yes → ☐ every day ☐ once a week ☐ 3 days a week

other _____

☐ no

b.) seasonal ☐ yes → indicate period _____

☐ no

4. Other products (in case yes, write five) _____

5. What is price per unit in case that you buy in these units of measurement?

Unit(s)	Purchase price (CFA)	
	Harvest period	Non-harvest period
Piece		
Number of piece (3, 5, 7, 10, 15…)		
Pile		
Bag		
Kilogram		
Other		

6. Quantities bought per: ☐ day _____ ☐ week _____ ☐ month _____ ☐ travel _____ unit (_____)

I

7. Availability of bitter kola from your source? Jan   Feb   Mar   Apr   May   Jun   Jul

     Aug   Sep   Oct   Nov   Dec   whole year

8. In which period of year do you sell much bitter kola? Jan   Feb   Mar   Apr   May   Jun

     Jul   Aug   Sep   Oct   Nov   Dec   whole year

9. What is your selling price by unit of measurement?

Unit(s)	Selling price (CFA)	
	Harvest period	Non-harvest period
Piece		
Number of piece (3, 5, 7, 10, 15…)		
Pile		
Bag		
Kilogram		
Other		

10. What factors do you consider in fixing of selling price? ☐ purchase price   ☐ price practised by other trades ☐ cost expenses   ☐ other _____

11. Who is your typical customer? ☐ M   ☐ F ☐ child   ☐ adult   ☐ elder

12. What quantity do you sell per: ☐ day _____   ☐ week _____ ☐ month _____ unit (_____)

13. Where do you get funds to buy? ☐ family ☐ loan at the bank   ☐ savings – a loan association ("tontines") ☐ selling of bitter kola ☐ selling other products ☐ other _____

14. Gender: ☐ M   ☐ F **15.** Age _____   **16.** Family status_____

17. Home village: _____ **18.** Distance to home village (km, hours): _____

19. Education level: ☐ primary   ☐ some secondary   ☐ finished secondary ☐ never gone to school

(Question for school ding age vendor):

20. Do you sell during the school period? ☐ yes → Do you sell during school hours? ☐ yes   ☐ no

                        ☐ no)

21. Do you believe in medicinal ability of *Garcinia*? ☐ yes, indeed ☐ yes ☐ rather no ☐ not at all

Thank you very much for your time and help.

Appendix A2: The questionnaire for street vendors (French)

Questionnaire: Étude de marché de *Garcinia kola* (graines) – vendeur ambulant

Informations sur le marché (collectées individuellement par le chercheur, photo du marché)

Emplacement du marché (ville, quartier, GPS): _____ Date (JJ / MM / AA): _____

1. Ou préférez-vous achetez? ☐ au marché → quels marché _____

☐ au niveau de la ferme → Dans lequel village(s)? _____

Quelle distance de ce marché? _____

Dans quel village préférez-vous acheter?__

Pour quelles raisons? _____

☐ autres _____

2. Auprès de qui achetez- vous votre bitter cola? ☐ paysans ☐ paysans + collecteurs ☐ collecteurs

☐ grossistes ☐ autres _____

3. Fréquence de vente: a.) toute l'année ☐ oui → ☐ quotidien ☐ une fois par semaine

☐ 3 jours par semaine   autres _____

☐ non

b.) saisonnier ☐ oui → indicate période _____

☐ non

4. Autres produits (au cas où „oui", écrivez) _____

5. Quels sont les prix en fonction des unités de mesure?

Unités	Prix d´achat (CFA)	
	Période d´abondance	Période de pénurie
Pièce		
Nombre de pièces (3, 5, 7, 10, 15…)		
Pile		
Sac		
Kilogramme		
Autres		

6. Les quantités acheté des par: ☐ jour __ ☐ semaine ___ ☐ mois __ ☐ voyager ___ unité (_____)

III

7. Disponibilité de bitter kola à partir de votre source? Jan　　Fév　　Mar　　Avr　　Mai　　Jui

Juil　　Aug　　Sep　　Oct　　Nov　　Déc　　L'année entière

8. Durant quelle période de l'année avait vos beaucoup de clients de Bitter kola? Jan　　Fév　　Mar

Avr　　Mai　　Jui　　Juil　　Aug　　Sep　　Oct　　Nov　　Déc　　L'année entière

9. Selon l´unité de mesure, à quelle prix revendez-vous le bitter kola?

Unités	Prix (CFA)	
	Période d´abondance	Période de pénurie
Pièce		
Nombre de pièces (3, 5, 7, 10, 15…)		
Pile		
Sac		
Kilogramme		
Autres		

10. Quels sont les facteurs que vous prenez en compte lors de la fixation du prix de vente? ☐ le prix

d´achat ☐ le prix pratiqué par les autres vendeurs ☐ les dépenses effectuées ☐ autres _____

11. Qui est votre client principal? ☐ M　　　☐ F　☐ enfant　　☐ adulte　　☐aîné

12. Quelles sont les quantités vendues par: ☐ jour ____ ☐ semaine ____ ☐ mois ____ unité (____)

13. D´où providient l´argent utilise pour le renouvèlement du stock? ☐ Famille ☐ credit bancaire

☐ des tontines ☐ de la vente du bitter kola ☐ de la vente des autres produits ☐ autres _____

14. Sexe: ☐ M ☐ F　**15.** Age ____　**16.** Situation matrimoniale _____　**17.** Village d´origine: _____

18. Distance du village d'origine (km, heures): _____　**19.** Niveau d´éducation: ☐ primaire ☐ certains

secondiare ☐ fini secondaire ☐ jamais allé(e) à l´école

(Question pour les vendeurs etudiants) :

20. Vendiez-vous pendant les temps de classe?

☐ oui → Vendiez-vous pendant les heures de classe? ☐ oui ☐ non　　　　☐ non

21. Croyez-vous en la capacité médicinale de bitter kola? ☐ oui en effet ☐ oui ☐ plutôt pas

☐ pas du tout

Merci pour votre collaboration.

Appendix B1: The questionnaire for market traders (English)

This questionnaire is addressed to traders (collectors, wholesalers, retailers.) of bitter cola in

the Mfoundi, Mokolo Markets and tolls gates of Nkometou, Obala, Edea and Boumnyébel

Questionnaire: Market survey of *Garcinia kola* (seeds) – trader   Date (DD/MM/YY): _____

Market information (collected individually by researcher, photo of the market)

Market name: _____   Market location (city, district, GPS): _____

A. History description of selling activities

1. What motivated you to enter business?   ☐ family history   ☐ profit   ☐ other____

2. How long have you been in this activity? _____

3. Other activities? _____

4. Type of vendor: ☐ harvester   ☐ harvester + collector   ☐ collector for more villages

☐ wholesaler   ☐ wholesaler + retailer   ☐ retailer   ☐ middleman

5. Place of selling: ☐ permanent stall   ☐ temporary stall   ☐ kiosk   ☐ no place

6. Selling frequency: a.) all year round ☐ yes → ☐ every day ☐ once a week ☐ 3 days a week

other _____

☐ no

b.) seasonal ☐ yes → indicate period _____

☐ no

7. Do you sell in other market? ☐ no   ☐ yes, where _____

8. Other products (in case yes, write five) _____

B. Supply and purchasing of bitter kola

9. From whom do you buy? ☐ farmers ☐ farmers + collectors ☐ collectors ☐ wholesalers

☐ other _____

10. Where do you buy? ☐ at market → which market _____

How far from this market? _____

☐ at farm level (villages) → In which village(s)? _____

How far from this market? _____

V

In which village do you prefer to buy? _____

Why there? _____

☐ other _____

11. What Quantity do you buy per: ☐ day _____ ☐ week _____ ☐ month _____ ☐ travel _____

unit (____)

12. What distance do you travel to buy? _____

13. How often do you travel? _____/_____

14. Quantities brought during one travel? _____(_____)

15. Type of transport? _____

16. Do you have your own transport? ☐ yes   ☐no

17. How much pay for transport? _____ (____)

18. Which aspects are important when buy bitter kola? ☐ colour   ☐ smell   ☐ taste

☐ size ☐ with skin ☐without skin ☐ fresh condition of goods   ☐ mould-free ☐ other ____

19. What is the price per unit in case you buy in various units of measurement?

Unit(s)	Purchase price (CFA)	
	Harvest period	Non-harvest period
Piece		
Number of piece (3, 5, 7, 10, 15…)		
Pile		
Bag		
Kilogram		
Other		

20. Availability of bitter kola from your source? Jan   Feb   Mar   Apr   May   Jun   Jul

Aug   Sep   Oct   Nov   Dec   whole year

21. Where do you get funds to buy? ☐ family ☐ loan at the bank   ☐ savings – a loan

association ("tontines")   ☐ selling of bitter kola   ☐ selling other products ☐ other _____

22. Which factors do you consider in negotiating price of buying? _____

VI

23. Do you pay any cost during buying? ☐ no   ☐ yes, which costs → select in the box

24. How much do you pay for?

Reason of cost	Value (CFA)	Unit
Handling		
Packaging		
Markets fees		
Rent of market stall		
Taxes		
Storage		
Security		
Other costs		

C. Selling of bitter kola

25. What factors do you consider in fixing the selling price?

☐ purchase price   ☐ price practised by other trades   ☐ cost expenses   ☐ other____

26. Who are your main clients?

☐ wholesalers ☐ wholesalers + retailers   ☐ retailers ☐ consumers ☐ other_____

27. Who is a typical consumer? ☐ M   ☐ F   ☐ child ☐ adult   ☐ elder

28. Which aspects do buyers use to buy your product? ☐ colour   ☐ smell   ☐ taste

☐ size ☐ with skin ☐ without skin ☐ fresh condition of goods ☐ mould free ☐ other____

29. In which period of year can your clients buy bitter kola from you?   Jan   Feb   Mar

Apr   May   Jun   Jul   Aug   Sep   Oct   Nov   Dec   whole year

30. What quantity do you sell per: ☐ day _____ ☐ week _____ ☐ month _____   unit (_____)

31. What is your selling price by unit of measurement?

Unit(s)	Selling price (CFA)	
	Harvest period	Non-harvest period
Piece		
Number of piece (3, 5, 7, 10, 15…)		
Pile		
Bag		
Kilogram		
Other		

32. Future expectations about selling volume? ☐ more, because _____

☐ less, because _____

☐ same

D. Losses of bitter kola

33. Do you have losses of seeds of bitter kola? ☐ no   ☐ yes

34. Quantity of losses? _____ %

35. Reason of losses? ☐ mould ☐ rats/mousses   ☐ stealing   ☐ other_____

36. Do you have any prevention against losses? ☐ no   ☐ yes → what_____

E. Problems with selling of bitter kola

37. Do you have any problems with selling/buying of bitter kola?

☐ competition ☐ lack of seeds of bitter kola ☐ few localities from which is possible to buy

☐ transport cost ☐ storage of seeds ☐ other _____ ☐ no problems

38. What do you think is the biggest problem in commercialization of bitter cola and why?
_____
_____

39. Do you have any idea how solve this problem?
_____
_____

F. Information about vendor

40. Gender: ☐ M ☐ F

41. Age _____

42. Family status_____

43. Education level: ☐ primary ☐ some secondary ☐ finished secondary ☐ never gone to school

44. Home village: _____

45. Distance to home village (km, hours): _____

46. Household size: _____

47. How many children? _____

48. Other members ☐ no ☐ yes _____

49. Do you believe in medicinal ability of *Garcinia*? ☐ yes, indeed ☐ yes ☐ rather no ☐ not at all

Thank you for your time and help.

Appendix B2: The questionnaire for market traders (French)

Ce questionnaire est adressé aux commerçants (collecteurs, grossistes, détaillants..) de bitter cola du marché du Mfoundi, Mokolo et les péages de Nkometou, Obala, Edéa et Boumnyébel

Questionnaire: Étude de marché de *Garcinia kola* (graines) - trader Date (JJ / MM / AA):_____

Informations sur le marché (collectées individuellement par le chercheur, photo du marché)

Nom du marché: _____   Emplacement du marché (ville, quartier, GPS): _____

A. Histoire description des activités de ventes

1. Quelles sont les raisons ayant motivé le choix de cette spéculation? ☐ Histoire de famille ☐ le

profit ☐ autres _____

2. Depuis combien de temps êtes-vous engagé dans cette activité? _____

3. D'autres activités? _____

4. Quel type de commerçants êtes-vous: ☐ récolteurs   ☐ récolteurs + collecteurs
☐ collecteurs des villages ☐ grossistes ☐ grossistes + détaillants ☐ détaillants ☐ middleman

5. Quel est votre emplacement de vente: ☐ décrochage permanent ☐ décrochage temporaire

☐ kiosque ☐ Aucune place

6. Fréquence de vente: a.) toute l'année ☐ oui → ☐ quotidien ☐ une fois par semaine

☐ 3 jours par semaine   autres_____

☐ non

b.) saisonnier ☐ oui → indicate période_____

☐ non

7. Vendiez-vous dans autre marché? ☐ non   ☐ oui, où _____

8. Autres produits (au cas où „oui", écrivez)_____

B. Approvisionnement

9. Auprès de qui achetez- vous votre bitter cola? ☐ paysans ☐ paysans + collecteurs ☐ collecteurs

☐ grossistes ☐ autres _____

10. Ou préférez-vous achetez votre bitter cola? ☐ au marché → quels marché_____

Quelle distance de ce marché?_____

☐ au niveau de la ferme → Dans lequel village(s)? _____

X

Quelle distance de ce marché? _____

Dans quel village préférez-vous acheter? _____

Pour quelles raisons? _____

☐ autres _____

11. Quelle quantité acheté vous par: ☐ jour _____ ☐ semaine _____ ☐ mois _____ ☐ voyager

_____ unité (____)

12. Quelle distance voyagez-vous pour acheter ? _____

13. A quelle fréquence voyagez-vous? _____

14. Les quantités achetées au cours d'un Voyage? _____ (_____)

15. Type de transport? _____

16. Avez-vous votre propre moyen de transport? ☐ oui ☐non

17. Combien cout le transport? _____ (____)

18. Quelles sont vos critères lors de l´achat des produits de bitter kola? ☐ couleur ☐ odeur ☐ gout ☐ taille ☐ avec la peau ☐ sans la peau ☐ état frais des marchandises ☐ sans moules ☐ autres___

19. Quels sont les prix par unité dans le cas où vous achetez dans les unités diverses de mesure ?

Unités	Prix d´achat (CFA)	
	Période d´abondance	Période de pénurie
Pièce		
Nombre de pièces (3, 5, 7, 10, 15…)		
Pile		
Sac		
Kilogramme		
Autres		

20. Disponibilité du bitter kola à partir de votre source? Jan   Fév   Mar   Avr   Mai   Jui

Juil   Aug   Sep   Oct   Nov   Déc   L'année entière

21. D´où provident l´argent utilise pour le renouvèlement du stock? ☐ famille ☐ credit bancaire

☐ des tontines ☐ de la vente du bitter kola ☐ de la vente des autres produits ☐ autres_____

22. Quels sont les facteurs que vous prenez en compte lors de la négociation du prix d´achat?_____

23. Payez-vous un coût supplémentaire durant l'achat? ☐ non

☐ oui, quels coûts → sélectionnez dans la boîte

24. Combien avez-vous payé pour?

Poste de dépense	Valeur (CFA)	Unités
Manutention		
Emballage		
Ticket de place		
Location de place		
Impôt libératoire		
Stockage		
Gardiennage		
Autres		

C. Activités de vente

25. Quels sont les facteurs que vous prenez en compte lors de la fixation du prix de vente?

☐ le prix d´achat ☐ le prix pratiqué par les autres vendeurs ☐ les dépenses effectuées ☐ autres___

26. Qui sont vos principaux clients? ☐ grossistes ☐ grossistes + détaillants ☐ détaillants

☐ consommateurs ☐ autres _____

27. Qui est consommateur typique? ☐ M   ☐ F   ☐ enfant   ☐ adulte   ☐ aîné

28. Quels aspects ne les acheteurs utilisent pour acheter votre produit? ☐ couleur ☐ odeur ☐ gout

☐ taille ☐ avec la peau ☐ sans la peau ☐ état frais des marchandises ☐ exempt de moisissures

☐ autres _____

29. Dans quelle période de l'année vos clients peuvent acheter bitter kola de vous? Jan   Fév   Mar

　　　Avr   Mai   Jui   Juil   Aug   Sep   Oct   Nov   Déc   L'année entière

30. Quelles sont les quantités vendues par: ☐ jour _____ ☐ semaine _____ ☐ mois _____ unité

(_____)

31. Selon l´unité de mesure, à quell prix revendez-vous le bitter kola?

Unités	Prix (CFA)	
	Période d´abondance	Période de pénurie
Pièce		
Nombre de pièces (3, 5, 7, 10, 15…)		
Pile		
Sac		
Kilogramme		
Autres		

32. Attentes futures concernant la vente du volume? ☐ plus, parce que _____

☐ moins, parce que _____

☐ même

D. Des pertes

33. Avez-vous des pertes en graines de bitter kola? ☐ non ☐ oui

34. La quantité des pertes? _____ %

35. A quoi sont dues ces pertes? ☐ moules ☐ rats/souires ☐ vol ☐ autres _____

36. Avez-vous une prévention contre les pertes? ☐ non ☐ oui → que _____

E. Problèmes avec la vente de bitter kola

37. De facon générale, qules sont les principaux problems que vous rencontrez dans la commercialisation du bitter kola?

☐ compétition ☐ manque de semences de bitter kola ☐ peu de localités avec possibilité d'achat
☐ coûts de transport élevé ☐ difficuûtés de stockage ☐ autres _____ ☐ pas de problème

38. Quel est le plus gros problème dans la commercialisation du bitter cola et pourquoi?
_____

39. Quelles propositions pouvez-vous faire pour lever ces contraintes?
_____

F. Informations générales sur l´enquêté

40. Sexe:☐ M ☐ F

41. Age _____

42. Situation matrimoniale _____

43. Niveau d´éducation: ☐ primaire ☐ certains secondiare ☐ fini secondaire ☐ jamais allé(e) à l´école

44. Village d´origine: _____

45. Distance du village d'origine (km, heures): _____

46. La taille du ménage: _____

47. Combien d'enfants? _____

48. Autres membres ☐ non ☐ oui _____

49. Croyez-vous en la capacité médicinale de bitter kola? ☐ oui en effet ☐ oui ☐ plutôt pas ☐ pas du tout

Merci pour votre collaboration.

Appendix C: The pictures from the survey

Interview with one of street mobile-vendors in Essombo 2/Terminus Miboman district

Mr. Jean-Paul Effa during interview in Mfoundi market

Difference between 2.5 l bucket (left) and cup

Seeds of bitter kola shortly after purchase