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COMPARISON OF WOMEN PRODUCERS OF CASSAVA STICKS AND BRAISERS OF MEAT PRODUCTS: INCIDENCE OF INFORMAL SALES CONTRACTS, IN HAUT OGOUÉ PROVINCE OF GABON

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ABSTRACT

In Gabon, cassava sticks are a popular food for the population. In some cases, it is sold via an informal contract between producers and restaurants. But there is little or no studies on this business. The objectives of this research were to compare the performance of women cassava sticks producers (WCSPs) and those of meat products braisers (MPBs) who exchange cassava sticks via informal sales contracts (ISCs), to describe these ISCs and to find the determinants to participate in ISCs. A sample of 157 WCSPs and 41 MPBs was surveyed in four localities in the Haut Ogooué province of Gabon. The sampling method was non-probabilistic, with the imperative of representativeness of each district and activity. Statistical tests of independence and comparison of variables as well as a probit logistic model were used. Results show that the spot market dominates these exchanges. Nevertheless 27% of WCSPs and 43.9% of MPBs were doing business through ISCs. A higher proportion of WCSPs with ISCs are heads of households. Furthermore, ISCs allow WCSPs to increase their monthly revenue by an average of 160%, thinks in particular to significantly higher production. Above-average weekly production and being the head of one's household were the determinants of WCSPs participation in ISCs. These women producers of cassava sticks with ISCs were also the ones who prepared the most appreciated type of cassava sticks according to the city of residence. The activity of MPBs was highly dependent on cassava sticks. Actors of that activity who had an ISC have higher monthly revenues and created more jobs. They mostly braised imported chicken cuts. Regarding the description of these ISCs, they are all unwritten. In 53.8% of cases, it was the WCSP that approached the MPB. With ISCs in operation, each WCSP delivers on average 3 times per week to its MPB client. In perspective, the life quality of households that benefit from those ISCs should be studied.

Key words: Local food, Contractualization, Informal economy, Women, Collective catering, Single parenthood

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RESUME

Au Gabon, le bâton de manioc est un aliment prisé par les populations. Dans certains cas, il est commercialisé via une contractualisation informelle entre les productrices et les restaurateurs. Mais ces échanges ont peu été étudiés. Comparer les performances des productrices de bâtons de manioc (PBM) et celles des braiseurs de produits carnés (BPC) qui échangent cet aliment via des contrats de vente informelle (CVI) ou non, décrire ces CVI et trouver les déterminants à leur participation ont été les objectifs de cette recherche. Un échantillon 157 PBM et 41 BPC a été enquêté dans quatre localités de la province du Haut Ogooué au Gabon. Des tests statistiques d'indépendance et de comparaison de variables ainsi qu'un modèle logistique probit ont été employés. Comme résultats, le marché spot domine ces échanges, cependant 27% des PBM et 43,9% des BPC font affaires par des CVI. Les PBM avec CVI ont en moyenne un chiffre d'affaires mensuel 1,6 fois supérieur, une production total hebdomadaire plus élevée et sont plus nombreuses à être chefs de ménage. Une production supérieure à 153 bâtons de manioc par semaine et le fait d'être chef de ménage sont les déterminants de la participation à ces CVI. Ces femmes productrices de bâtons de manioc avec CVI sont aussi celles qui préparent le type de bâtons de manioc le plus apprécié selon la ville de résidence. L'activité des BPC est fortement dépendante des bâtons de manioc. Les BPC ayant un CVI ont des recettes mensuelles plus élevées et créent plus d'emplois. Au menu, ils proposent très majoritairement les découpes de poulets importées. Concernant la description de ces CVI, ils sont tous non écrit. Dans 53.8% des cas, c'est la PBM qui s'est rapprochée du BPC. Lorsque le CVI est noué, il implique 3 livraisons par semaine en moyenne. Après analyse, ces CVI sont rendus possible grâce à une juxtaposition de plusieurs facteurs notamment, une demande soutenue, une offre concurrentielle, le besoin des femmes élevant seules des enfants d'augmenter leurs revenus et des BPC de sécuriser leurs approvisionnements. En perspective, la qualité de vie des ménages qui bénéficient des ces CVI devrait être étudiée.

Mots clés : Aliment local, Contractualisation, Economie informelle, Femme, Restauration collective, Monoparentalité



INTRODUCTION

Gabon has been experiencing significant urbanization for several decades, as in many African countries. This phenomenon is causing major upheavals in its economy and its social and family structures. The growth of urban women's single parenthood is one of the most visible changes [1]. These women are forced to be creative in order to earn more money, against a backdrop of concentrated urban poverty, increasing social exclusion and an exploding of informal economic sector [2].

The informal sector refers to the production and employment provided by small enterprises not recognized in their corporations and not registered by the authorities [3]. Informal employment refers to workers in the informal or formal sector without legal social protection. Thus, the informal economy concerns all the units, activities and workers mentioned above and results of their efforts. The importance of the informal economy in a country decreases when the Gross Domestic Product (GDP) per capita, the quality of the institutions present and the ease of doing business are high [4]. Salinas *et al.* [4] reached these conclusions based on data collected on 133 countries around the world. In this work, they confirm that the informal economy and the jobs it provides are an adaptation to the shortcomings of developing countries. These countries cannot offer people formal jobs, especially with regard to vulnerable social groups such as young people, women and migrants [4]. In 2017, informal sector represented 34% of the Africa's economy, with significant variations depending on the country. In Gabon, in 2017, the informal sector accounted for 52.1% of GDP [5].

Women are very present in the informal economy, especially in activities that concern local agri-food products [6, 7, 8]. These informal economic activities help to reduce their vulnerability, increase household food security, improve children's school attendance and, more generally, empower rural and urban women [9]. An in-depth investigation in the Kumasi Metropolis in Ghana indicated that women's participation in the informal sector improves their socio-economic well-being [2]. It materialized by an access to income, participation in household spending, household decision-making, community activities and an improvement in the quality of housing. Some authors highlight the challenges posed by this situation, such as sustainable economic development, occupation and inclusion in urban space, the use of child labour, international migration or the sanitary quality of the products on offer [8, 10].

In developing countries, local artisanal food products are seldom studied as a source of income for the poorest [11]. These products, very popular to rural and urban people, provide work for many people, especially women and young people [10, 12,

13]. The transformation of cassava root into a stick wrapped in *Marantaceae* leaves is called cassava stick. In Gabon, cassava sticks are the main form of cassava products consumed, and are exclusively prepared by women [14]. Each inhabitant of Gabon consumes around 158 kg of cassava per year, cassava sticks are the food with which dishes are more consumed in households and restaurants after imported rice and wheat [15, 16, 17]. In Gabon's cities, cassava sticks are the subject of an intense trade [17, 18]. These exchanges are carried out under the seal of the informal sector. The "real market" observation dear to Yeldwisch [19] shows that some women cassava sticks producers (WCSPs) count restaurants among their regular customers. In the markets and along the alleys of the districts, most sales are made in cash and by the unit (spot market). Exchanges between WCSPs and certain restaurants last over time and operate with verbal agreements, which make them sales contracts (SC) similar to informal farmer contracts (IFCs) [19, 20]. The trade of braised meat products by the roadside or near busy areas is widespread in African cities. Whether the vendor is itinerant or not, the main animal species braised, and the gender of the owners of these businesses are some of the factors that differentiate them. This business offers low-priced animal protein to residents of working-class neighborhoods and provides income for women and young people [15, 21, 22]. Thus, in Sénégal *Débitéries* offer fresh beef [21], in Cameroonian cities, braised fish or pork are often on the menu [22], in Gabon, mainly braise cuts of imported poultry [15].

There is little or no research on the informal contract marketing of hand processed agricultural products for local consumption in developing countries. These exchanges, which are intensifying in cities in developing countries, particularly in Africa, are driven by growing urbanization and the extension of out-of-home catering, in which, local products occupy an important place [23]. Due to competition between actors, strategies to secure supplies and build customer loyalty are thus developed. One of these strategies is a verbal or written agreement for regular exchange between business partners [20]. Contractualization is an organizational innovation in which the partners exchange goods and services other than on the spot market [2, 22]. These sales contracts can be formal (written) or informal (oral) [24]. They emerged to avoid the uncertainties of the spot market, because the partners have an agreement together that specifies the price, quantities and quality of the products exchanged [24]. Studies conducted in Benin, Chile and Iran have shown that ISCs are used between actors of small complementary activities. In particular, farmers and rural collectors or farmers with processing companies, intermediaries or wholesalers. These economic actors operate not far from each other, and the products exchanged are obtained artisanally and their lifespans are often short. Regular interactions and mutual trust are elements that make these ISCs possible



[19, 21, 23]. The objective of this research was to analyze the marketing of cassava sticks and to characterize the informal sales contracts (ISCs) that exist between WCSP and MBP. The aim is to pave the way for contract farming research in African countries to be extended to locally processed artisanal foods for domestic markets.

MATERIALS AND METHODS

Study area

This study was conducted in the province of Haut Ogooué in south-eastern Gabon (Figure 1). This country is located in Central Africa, straddling the equator and its south-eastern part borders Congo Brazzaville. In 2013, this country, nearly 85% of which was covered by tropical forest, was populated by only 2.3 million people on 267,667 km². These people, as well as the country's economy, are concentrated in the cities of the Atlantic coast, such as Libreville, the capital, and Port-Gentil [24, 25]. Thanks to the mining companies that exploit manganese and the presence of decentralized state services, Franceville and Moanda, the two main cities of Haut Ogooué, are home to a relatively large population for Gabon. For the survey, four of the eleven departmental capitals in this province, which are home to 85% of the total population of this area, were selected [27]. The data were collected in four similar cities two by two. The first group was made up of the cities of Franceville and Moanda, the second group was made up of the cities of Okondja and Léconi. The last mentioned are secondary cities at the provincial level, at the national level, they are rural agglomerations. This province was chosen because it was the area of origin of the Téké cassava stick, which is very popular in the country and is the subject of a sustained trade.



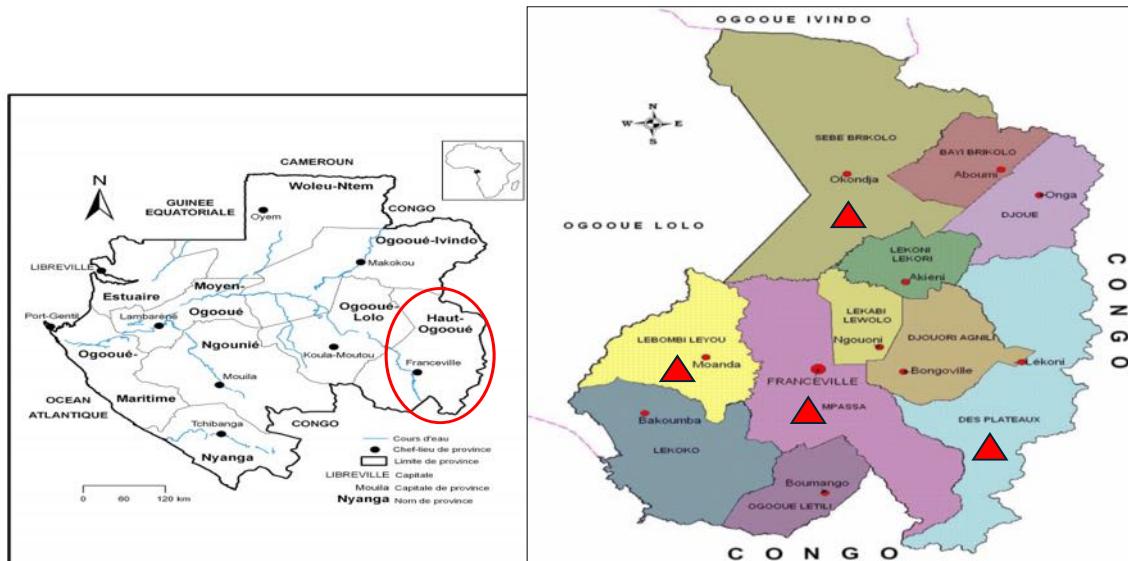


Figure 1: Location of the Haut Ogooué province on Gabon's map and the cities where the data were collected on the department of Haut Ogooué map

Legend: Data Collection Departments

Source: [29]

Sampling and data collection

In the absence of a database on MPB and WCSPs, the surveyed actors were selected using a non-probabilistic but stratified sampling method. The only stratum being the city of residence. The requirements were to cover all the districts of the cities surveyed, to interview the most WCSPs and MPBs possible. In each district, when possible, at least 5 WCSP and 5 MPB were interviewed [30]. The sample size was 157 for WCSPs and 41 for MPBs. For WCSPs, the distribution by city was 84 for Franceville, 36 for Moanda, 21 for Okondja and 16 for Léconi. Regarding the MPBs, the investigation was able to implicate 25 in Franceville, 10 in Moanda, 3 in Okondja and 3 in Léconi. These low numbers are linked to the small population of Gabon in general and of the towns in the interior of this country in particular. Indeed, 2.3million inhabitants of Gabon in 2013 were concentrated in Libreville, the capital, while the cities of Franceville and Moanda were relatively populated, with 129,694 and 64,569 inhabitants, respectively. The towns of Okondja and Léconi had only 16,443 and 9,054 habitants in 2013 [27].

The data collection was done in a single pass, during the second half of 2023. The actors were approached at their places of activity, which are visible in the cities surveyed. After a verbal consent, a semi-structured questionnaire was administered face-to-face. For WCSPs and MBPs, in addition to socio-demographic variables, the

questionnaire provided information on production and marketing of cassava sticks and braises meats. An emphasis was made on the existence of possible ISC and, if applicable, the functioning of these contractual exchanges.

Statistical processing and analysis of data

The data collected was transferred to the R Studio software version 4.2.1. As analysis, descriptive statistics (mean, percentage, standard deviation) were sufficient for the general aspects of the activities studied. The other analyses that were done were:

- The Chisquare test, sometimes replaced by Fisher Exact test: to compare percentages of qualitative variables.
- Student's test: to compare the means of quantitative variables.
- Probit logistic regression model: to test 6 variables that could explain participation in ISCs by WCSPs.

The 6 explanatory variables selected were transformed into binary qualitative variables. This transformation was necessary because, for 6 binary explanatory variables, at least 120 actors interviewed are needed according to this calculation: $(6 \times 2 \times 10) = 120$ [30]. The 6 explanatory variables used were as follows: (i) place of residence (modalities: medium-sized town or rural agglomeration), (ii) head of household (modalities: yes or no), (iii) household size (modalities: high or low to medium), (iv) professional experience (modalities: 10 years and more or less than 10 years), (v) origin of the cassava paste (modalities : local or imported) and finally (vi) Quantity of cassava sticks prepared per week (modalities : high or low). Thus, the size of the household takes the high modality when its value is greater than 6 persons. The quantity of cassava sticks prepared per week is considered high when it is more than the average, which is 153 cassava sticks according to the results in the section of cassava sticks production conditions and performances. Similarly, women producers who sometimes used local cassava paste and other times imported cassava paste were classified as using imported cassava paste.

These 6 explanatory variables were chosen in order to compare the results of other authors. Indeed, several studies have shown that the urban context, the fact of being heads of household and having to take care of children alone encourage women to enter into Contract Farming (CF) [7, 18, 21]. In addition, the variable total cassava sticks produced per week make it possible to test the hypothesis indicating that, for a WCSP that has managed to honor its ISC over fairly long period, its activity is now more intensive. The response variable of the model is participation to an ISC (modalities: yes recoded "1" or no recoded "0"). The model was written as follows in R studio software that accepted it:



ISC (Y(Yes"1", No"0"))

$$\begin{aligned}
 &= \beta_0 + \beta_1(\text{place of residence}) + \beta_2(\text{head of household}) \\
 &+ \beta_3(\text{household size}) + \beta_4(\text{professionnal experience}) \\
 &+ \beta_5(\text{cassava paste origin}) \\
 &+ \beta_6(\text{Total cassava sticks prepared per week}) + \varepsilon
 \end{aligned}$$

Thus, β_1 - β_6 represent the coefficients associated with the explanatory variables and ε follows a standard distribution. The thresholds for accepting differences were 10, 5 and 1%.

RESULTS AND DISCUSSION

Socio-demographic profiles of women cassava stick producers with and without informal sales contracts

Table 1 compares the sociodemographic characteristics of the WCSPs surveyed with and without ISCs.

The results show that one-third of women working in this activity were heads of households. This proportion rose by 9.2 points for those with ISCs. Overall, the sociodemographic characteristics of WCSPs did not change between those with ISCs and those without, with the exception of household size. Women cassava stick producers with ISCs live in significantly larger households (10% level of significance).

This small sociodemographic difference between WCSPs with ISC and those without is a striking fact. Indeed, it comes from populations with fairly uniform social characteristics. This reliable difference is evocative of a demarcation due to ISCs. In Kenya, it has been found that a high proportion of women heads of household are among the first women to join the supply channels of avocados for export [7]. This same study specifies that, while these pioneers were most educated, they initially had less access to improved avocado varieties and faced more constraints in accessing credit. The results of the present study are similar to those of the study conducted in Kenya, because it showed that, as women face more constraints, they are the ones who have managed to tie the most ISC. In addition, female heads of household participate more in contract farming in Vietnam [31].

Cassava sticks' production conditions and marketing

Table 2 presents some elements on the production and sale conditions of cassava sticks in Haut Ogooué province in 2023, compared to those with and without ISC.

Clearly, for WCSPs, having an ISC makes the activity more intensive. This can be seen in the values taken by all the quantitative variables describing the production and marketing of cassava sticks from the 2 groups. Thanks to the ISCs, the monthly



turnover of WCSPs with ISCs was on average increased by 140,000 Franc des Communautés Françaises d'Afrique (FCFA). The cassava paste used has two origins, part comes from the fields of the processors, and the other part is bought from importers or other local farmers. These results highlight a strong adaptation of WCSPs with ISCs to their markets. Indeed, women with ISCs were also the ones who delivered the most cassava sticks to households. More than the others, they prepared the most popular type of cassava stick according to the city of residence.

There are three possible explanations for these results: the good quality of the cassava sticks produced, higher money requirements for WCSP and finally, the positive effects of ISCs. The good quality of cassava sticks is undeniable, because MPBs have immediate feedback from their customers. When the cassava sticks are of poor quality, the MBP customers tell immediately the restaurant owner, as the vast majority eat their orders on-site. He then passes the information on to his supplier. If she doesn't improve the quality, the restaurant owner terminates the ISC. Two elements in the results presented in Table 2 support this explanation, which indicates that WCSPs must make good cassava sticks to keep the ISC with MPBs. The intermittent absence of customers is the first constraint mentioned by all WCSPs. This means that having a customer who buys cassava sticks in bulk and on a regular basis is a huge advantage. Secondly, the fact that WCSPs with ISCs are also the most numerous to deliver to households in these regions. The inhabitants of these cities are supposed to be good connoisseurs of the product. As for the need to increase income, this is the most logical explanation for these efforts to enter into ISCs. Results obtained highlight two indicators that support this explanation. On the one hand, WCSPs with ISCs are more likely to be heads of households, which are larger households (Table 1). Regarding the positive effects of ISCs, the present work demonstrates this, through the production of WCSPs with ISCs which is significantly increased, that's to say +34% on average. Indeed, the guarantee of an outlet stimulates production. Thus, nearly half of the WCSPs with ISCs said that they sometimes prepared specifically to honour the contract they had with an MPB. By drawing a parallel with contracts farming (CF), all the research comes to the same conclusion, this system reinforces the activity of the actors concerned [19, 29, 30]. Without having the formal attributes, these agreements between WCSPs and MPBs are indeed one of the variations of the sales contracts explained by Eaton and Shepherd [34].

Production conditions and performance of meat braising products

This activity is very visible in the cities of Gabon. It consists of braising meat products often imported from Europe or Latin American countries. These meat products often arrive in 10kg frozen cartons. The MPBs work in small sheds made of more or less durable materials near intersections and near drinking establishments. Chicken



wings and thighs are the vast majority of the offer of these restaurants. This is the origin of the name commonly given to this activity, "Nike," referring to the famous sportswear brand whose distinctive sign is similar to a hen's wing [15]. Some also braised beef, fish and rarely fresh pork or mutton. This activity was mainly practiced by urban men of foreign origins. Their average age was 36.6 years, and more than half have not reached secondary education.

Table 3 presents some of the technical characteristics of the activity of MPBs in Haut Ogooué in 2023 by comparing those who benefited from an ISC and those who did not.

The cassava stick is essential for the proper functioning of the MPB activity. In fact, more than 80% of their customers accompany the dishes served with this food (Table 3). These restaurants are engaged in one ISC of cassava sticks, sometimes 2, and are delivered by WCSPs on average 3 times a week. Some ISCs had a duration of more than 2 years at the time of the survey. Meat braisers products that secure their supplies of cassava sticks via ISCs with WCSPs have more customers per day, which allows them to obtain a higher monthly turnover. This more intensive activity allows them to employ slightly more people than others.

The first part of these results confirms that the informal sector and local food are sources of employment for the least advantaged people, especially women and migrants [2, 32]. The strong presence of foreigners among the MPBs can be explained by the fact that Gabon has a rental economy. Like many countries in this situation, this attracts a foreign workforce motivated by the higher wages and the fact that arduous jobs are abandoned by the local workforce [36]. The second part of these results shows the benefits of ISCs for MPBs. Those MBPs with ISC have more customers and use more cassava sticks each day, this results in higher monthly revenue, and they employ 1 to 2 more people than the others. Informal sale contracts have made the activity of MBPs more insensitive in the same way that FC are for farmers [18, 30].

Characterization of the informal sales contract

Compared to the initial sample 41WCSPs and 18 MBPs are engaged in at least one ISC, Figure 2 shows some characteristics of these ISCs.



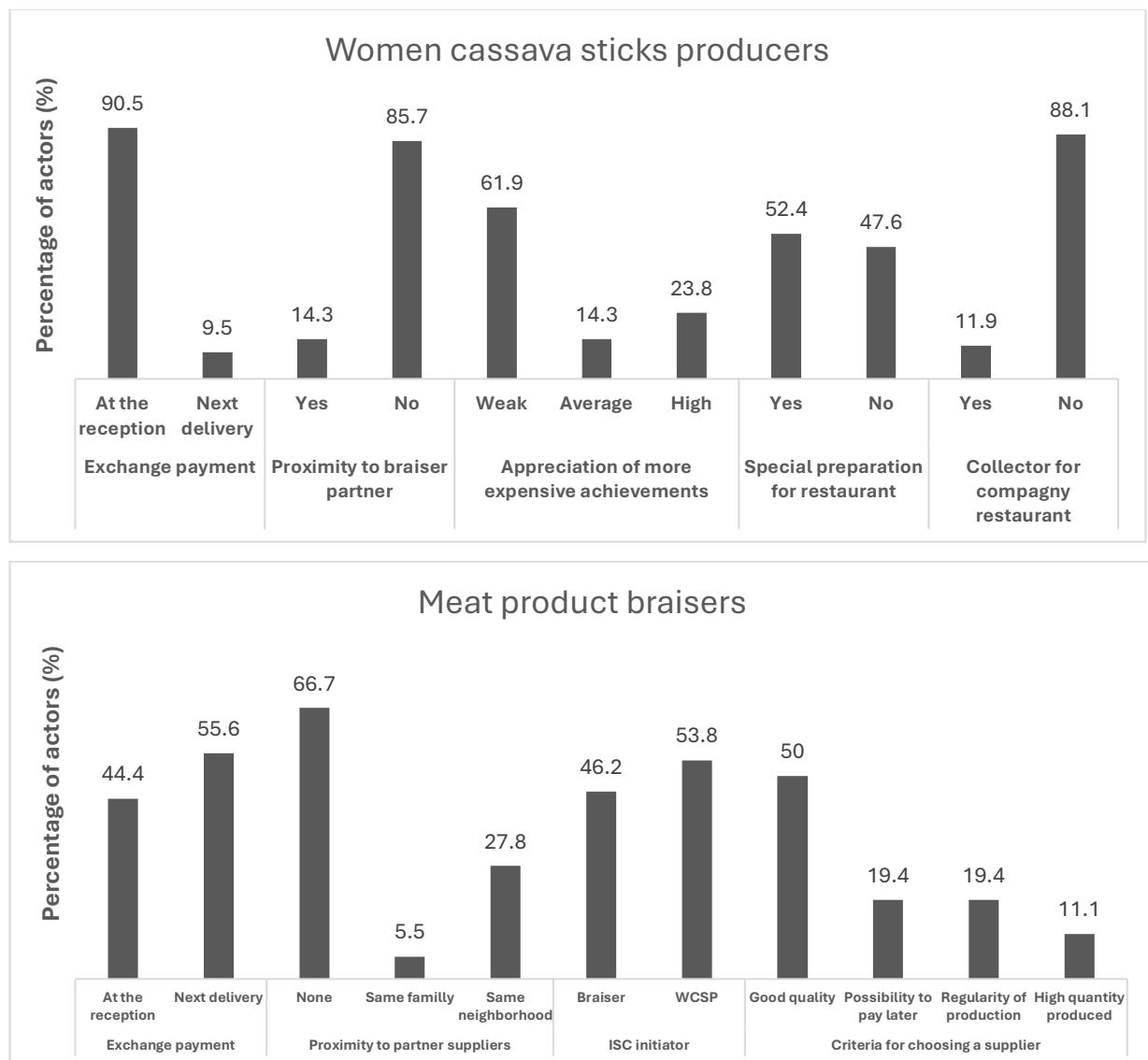


Figure 2: Some elements on the initiation, operation and certain benefits of ISCs between MPBs and WCSPs in Haut Ogooué, Gabon in 2023

Figure 2 shows that ISCs are often entered into at the initiative of the WCSPs. After analysis of the parameters linked to the implementation and duration of these contracts, an ISC will last if the WCSP's activity meets the following conditions:

- Good quality of the production.
- High quantities produced on a regular basis.
- A higher-than-average productive capital that allows the actor to accept deferred payments.

Women cassava sticks producers that meet these requirements and who participate in ISCs make for their household investments that are considered to be of high value.

Moreover, the investigation also showed that none of the ISCs is written, and the termination is often at the initiative of the MPBs.

In analysing the functioning of the ISCs between the WCSPs and MPBs, these contractual exchanges require a minimum size for the activity of the actor wishing to take part in them. This is necessary for the ISC to be concluded and also for it to last over time. This is due to the success of MPBs, especially among young men and women who like to eat in those restaurants [15]. Indeed, in the face of the significant demand recorded by the MPBs, as evidenced by the monthly turnover which goes up to 1.68 million FCFA for the most efficient, which suggests a monthly income that would be significantly higher than the Guaranteed Interprofessional Minimum Wage (GIMW) which is 80,000 FCFA/month in Gabon. This high demand requires MPBs to work with suppliers they consider to be reputable in order to secure their supply of cassava sticks. This result is quite close to the observations made in a study conducted in Vietnam [31]. Hoang and Nguyen [31] showed that: product quality and willingness to manage excess harvests are two of the factors that influence Vietnamese farmers' participation in CFs. In Mozambique, farmers who most often conclude the CFs are the ones who have already implemented an irrigation program. Although the support offered by the customers of these farmers offers help for the implementation of such a system [19].

The first graph in Figure 2 shows that 38.1% of women benefiting from this informal contractualization acquired durable goods for the benefit of their households, the cost of which was assessed as medium or high. This makes it possible to maintain that these ISCs are a means of fighting poverty. Thus, 21% of WCSPs with ISCs either bought a plot for building land or built a house. These are the achievements whose cost was considered high. Several authors have already shown that the marketing of agricultural products under contract is a means of combating poverty, especially among women [18, 30, 34, 35].

Determinants of participation in an informal sales contract

The results of the probit logistic regression model performed to determine the variables explaining the participation of WCSPs in ISCs are given in Table 4.

The model used indicates 2 variables that favour the participation of WCSPs in ISCs: household size and total cassava sticks produced per week by each woman. When these variables take values considered high, the likelihood that the women involved will participate in ISCs increases. By way of explanation, a woman belonging to a household of several people must increase and secure her income especially if she is the head of the household. However, informal sales contracts allow these 2 objectives to be achieved. The fact that this work already showed that 40.5% of WCSPs with ISCs are heads of household supports this argument. In addition,



customers under contract mean sales and therefore guaranteed income. Regarding the total cassava sticks produced per week by each WCSP, when it is high, the restaurant owner is reassured of the availability of cassava sticks. It is also possible to think that participation in the ISCs increases this variable.

To put this result into perspective with other work, the tested variables were not used in another research. They are therefore compared to close variables, notably the size of the farm, which is a determining factor in the participation of Vietnamese farmers in contract farming [31]. But the authors of this research specify that the most important variables are membership of a cooperative and the holding of certificates that can guarantee the quality of production. The total cassava sticks produced per week indirectly indicates the size of these micro-agrifood businesses. That work is partly in line with that of researchers who worked in Vietnam. In Benin, on the other hand, it is the difficulties of access to production factors that push rice farmers in the Hydro-Agricultural Development area of the Niger Valley to resort to contractualization [25]. For these farmers, it is the contractualization that makes production possible and regular, which is different from results of this work. This research maintains that the conclusion of a ISC is subordinate for the WCSPs to the achievement of a level of production deemed satisfactory by the client. This difference is probably linked to two factors: the nature of the product traded and the relative isolation of the producer. Regarding the nature of the product, this study focuses on a commodity that has already been processed, the other study focuses on fresh rice [25]. Rice production requires higher expenditures, particularly on the purchase of inputs and the remuneration of labour. This is different from the artisanal processing of cassava paste into cassava sticks. As far as landlocked conditions are concerned, food crops are generally produced far from urban centres, while their processing is often localized in cities. Thus, sales contracts for artisanally processed products are more like farm contract for market garden crops, which have a shorter shelf life and are often planted around towns.

CONCLUSION AND RECOMMENDATIONS FOR DEVELOPMENT

This study analysed the framework for the exchange of cassava sticks between MPBs and WCSPs. It took place in south-eastern Gabon in the second half of 2023 and involved 157 WCSPs and 41 MPBs. The results showed that the spot market dominates. But, about 1/3 of the WCSPs and half of the MPBs have an ISC to exchange cassava sticks. Thanks to these ISCs, these activities are boosted and their monthly turnover increases significantly. These ISCs are concluded by actors whose activity has exceeded a threshold that has not been determined. This study illustrates the ability of some women to take advantage of the opportunities offered by urbanization despite the constraints of growing single parenthood. In fact, it



showed that women who head the largest household are those who do the most in approaching MBPs in order to conclude contracts with them. Following this work, recommendations for development are made for the following targets:

- a) Institutions working to increase national agriculture production, to increase the share of local foods in the diets of urban dwellers and those fighting against poverty among vulnerable women. These include the Ministry of Agriculture, the Ministry for the Promotion of Women, and the Ministry for Fight Against Poverty.

These institutions are encouraged to put in place a system capable of making local artisanally processed food products available to urban consumers. The main tool of this system will be contractualization. On one side, these institutions will identify the women producers of the food and on the other side, the nearby restaurant and urban stores. Restaurants and stores indicated their expectations in terms of quantity, quality and regularity of the product exchanged, then public officials should help women producers to meet these requirements through training and provision of equipment to increase their productivity. To encourage the participation of restaurants and stores, the system should partially or fully pre-finance the purchases of restaurants and stores.

- b) Researchers, who must continue their research in order to assess the impact of these ISCs on the quality of life of households benefiting from it. They can also work to find the threshold below which the activity of women producing processed local food cannot benefit from even informal contract with restaurants and stores.

Conflict of interest

The authors declare that they have no conflict of interest.



Table 1: Comparative sociodemographic characteristics of MPBs with and without ISC

Variable	Modality	All WCSPs (n=157)	With ISC (n=41)	Without ISC (n=115)
Sex, Woman		157(100)	42 (100)	115(100)
Head of household, Woman		53(33,8)	17 (40,5)	36 (31,3)
Average age (year)		42.7±10.0	42.7±10.5	42.8±9.8
Instruction	None	8(5,1)	1(2,4)	7(6,1)
	Primary	47(29,9)	10(23,8)	37 (32,2)
	Secondary	99(63,1)	31(73,8)	68 (59,1)
	University	1(0,6)	0	1 (0,9)
	NA	2(1,3)	0	2 (1,7)
Situation	Single	45(28,7)	14 (33,3)	31 (27,0)
	In couple	104(66,2)	25(59,5)	79(68,7)
Marriage	Widow	8(5,1)	3(7,1)	5(4,3)
Household size		6.0±2.9	6.8±3.0*	5.8±2.9
Place of Residence	Medium-sized city	120(76,4)	31 (73,8)	89 (77,4)
	Rural agglomeration	37(23,6)	11 (27,2)	26 (22,6)
Professional experience	Under 10 years old	64(40,8)	16 (38,1)	48(41,7)
	10 years and up	93(59,2)	26 (61,9)	67 (58,3)
Nationality	Gabonese	146(93,0)	41(97,6)	101 (87,8)
	Foreign	11(7,0)	1(2,4)	14(12,2)

() =percentage; / = not specified; NA= unanswered; Level of significance: *(10%)



Table 2: Comparative production and sales conditions of WCSPs with ISCs and without ISCs

Variable	Modality	All WCSPs	With ISCs	Without ISCs	P-value
Actor		157	42 (26,7)	115 (73,3)	
Number of delivery contracts per WCSP			1.5±1.0		
Origin of the paste	Own field only	43(27,4)	11(26,2)	27(32,0)	0.7581
	Own field and purchases	75(47,8)	31(73,8)	53(46,1)	
	Purchases only	39(24,8)	9 (21,4)	30 (26,1)	
Performance	Preparation frequency per week	2.5±1.3	3.0±1.6**	2.3±1.1	0.0066
	Frequency of delivery to restaurants per week		3.5±1.7		
	Number of buckets for a preparation	2.8±1.2	3.2±1.5**	2.6±1.1	0.0196
	Quantity of cassava sticks per preparation	57.0±30.1	70.0±38.2**	52.3±25.1	0.0075
	Quantity of cassava sticks prepared per week	152,9±157,6	245,8±254,9**	119,0±79,2	0.0027
	Type, Téké	106(67,5)	23(54,8)	83(72,2) *	0.0615
	Format, Medium	108(68,8)	26(61,9)	82(71,3)	0.1382
Constraints ⁺⁺	Turnover (FCFA/month)	273,083 ±243,583	378,762 ± 350,713**	234,487 ±177,025	0.0139
	Family helping member, Yes	54(34,4)	16(38,1)	38(33,0)	0.7152
	Helping person, Child	32(20,4)	10(23,8)	22(19,1)	0.1188
	Age of the helping person (year)	14.3±2.1	14.8±1.5	14.1±2.3	0.1146
	Household Delivery, Yes	21(13,4)	11(26,2) **	11(9,6)	0.0397
	Method of sale, at the market or at a crossroads	109(69,4)	6(14,3)	103(89,6) **	0.000
Constraints ⁺⁺	No	68(43,3)	21(50)	47(40,9)	
	Lack of customers	22(14,0)	6(14,3)	15(2,2)	
	Lack of packaging sheets	21(13,4)	1(2,4)	13(11,3)	
	Arduous work and poor harvests	19(12,1)	4(9,5)	15 (13,0)	
	Lack of cassava	16(10,2)	3(7,1)	3(2,6)	
	Other	16(10,2)	7(16,7)	12 (12,4)	

bucket: standard type of container owned by all mills and processors, well loaded and packed cassava paste weighs 15kg; ⁺⁺an actor can cite several constraints; () =percentage; Level of significance: * (10%); **(5%)



Table 3: Some technical characteristics of the meat product braising activity with and without cassava stick ISCs in Haut Ogooué surveyed in 2023 (n=41)

Variable	Modality	All	With ISCs	Without ISCs	P-value
Actor		41	18(43,9)	23(56,1)	
Number of WCSPs delivering under contract			1.61±1.22		
Contract Duration (Year)			1.6±1.2		
Percentage of dishes served with cassava (%)		87.5±25.2	95.3±9.1*	81.9±31.2	0.0747
Close to a market, Yes (%)		32(78)	12(66,7)	20(87)	0.3785
Loan of a drinking establishment, Yes (%)		13(31,7)	6(33,3)	7(30,4)	0.9987
Braised meats	Garlic and chicken thighs (V1)	12(29,3)	5(29,4)	7(29,2)	0.9483
	V1 + Beef	20(48,8)	11(64,7)	9(37,5)	
	V1 + pork carving	9(21,9)	1(5,9)	8(33,3)	
Accompaniments (%)	Cassava sticks only (A1)	27(65,8)	11(61,1)	16(69,6)	0.8517
	A1+ Rice & Bread	12(29,3)	6(33,3)	6(26,1)	
	Varied	2(4,9)	1(5,6)	1(4,3)	
Amount of cassava sticks used per day		12.95± 16.29	21.1±22.3**	6.6±2.6	0.01665
Frequency of cassava reception per week			3.3±1.8		
Number of customers per day		41.4±33.2	51.9±41.5*	33.3±22.6	0.09877
Most frequent customers (%)	Single man or woman	16(39,0)	9(50)	7(30,4)	0.1517
	Single man or woman; Group of friends	14(34,1)	3(16,7)	11(47,83)	
	Man alone; Group of friends	1(2,4)	1(5,6)	0	
	All types	10(24,4)	5(27,8)	5(21,7)	
Number of employees		1.5±0.7	1.7±0.9*	1.3±0.5	0.08487
Average price of a dish (FCFA)			750±176		
Monthly turnover (FCFA)		744 244±598 319	934,000± 746 968*	595,739± 408 918	0.09619
Opening hours (%)	From 8 am to 11 pm	39 (95 ,1)	16(88,9)	23(100)	0.3635
	Until very late at night	2(4,9)	2(11,1)	0	

(%) = percentage; Level of significance: * (10%); ** (5%); ***(1%)



Table 4: Determinants of engagement in an ISCs for WCSPs

Variable	Estimate	Marginal effect	Standard error	z value	P-value
Intercept	0.47059***	1.6009	0.1051	4.478	1.49e-05
Place of residence, Middle City	-0.05359	0.94782	0.08493	-0.631	0.52901
Head of household, Yes	0.13364	1.1429	0.07471	1.789	0.07568
Household size, Low-average	-0.19309**	0.8244	0.07729	-2.498	0.01356
Professional experience, Less than 10years	-0.02074	0.97947	0.077339	-0.283	0.77783
Origin of the paste, Local	-0.00942	0.9906	0.7768	-0.121	0.90364
Quantity of cassava sticks prepared per week, Low	-0.20327**	0.81605	0.07320	-2.777	0.006619

Level of significance: ** (5%); ***(1%); ****(0,1)



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