

Geography of the Production of Ipomoeabatatas (Sweet Potato): An Analysis in the Space of Santchou (West-Cameroon)

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Abstract

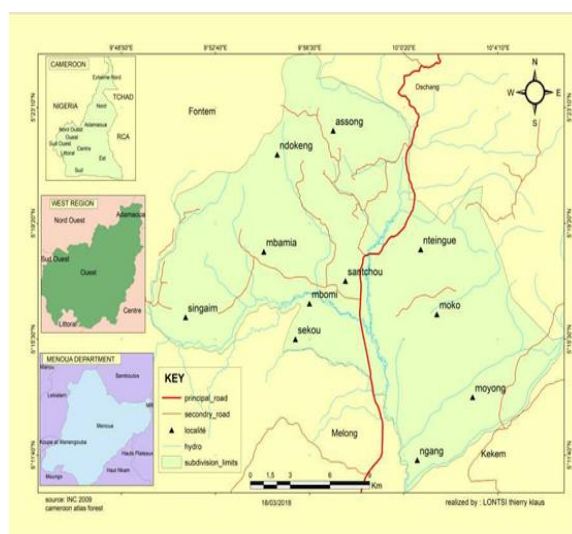
This article presents the socioeconomic impact of sweet potato for the population of Santchou (West Cameroon). This ancient crop takes the second position after cassava. The Santchou production area is sandy-clay and sometimes it drains in some places but rich in organic matter favorable for this commercial crop. This study was carried out for 05 months that is, (November-March 2017), in five villages, out of a population of 70 heads of households, chosen randomly. Hence as a criterion of choice: to have at least one hectare of sweet potato. The results show that the improved varieties are more productive (5 to 10 tones/ hectare) compared to the traditional variety (3 to 5 tones in average). The problem recorded is post-harvest management because of the rapid decay of this product compared to cassava or potato. The interest in this crop led to the closure of the rice company (SODERIM) of the 1990s which was considered as the driving force of the Mbos plain (Santchou). Now our days, the sector generates little temporary and permanent jobs to solve the problem of unemployment and contributes to the social integration of young people and adults in this activity. Despite the traditional production techniques, sweet potato is a financial source (10.000FCFA / net) and the source of food for the population. The benefits of this crop allow the farmer to satisfy his need and participate in financial savings.

Keywords - Socioeconomic development, West Cameroon, Sweet potato, Tubers.

I. INTRODUCTION

In the savannas of western Cameroon, the cultivation of Ipomoeabatatas commonly known as sweet potato is positioned (Lyonga, and Ayuk-Takem, 1990). It is less demanding in soil and is more productive per hectare, with an average yield of 6.5t / ha (Ndamage, 1985, Dahniya, 1982). This culture has a rapid vegetative cycle and harvested between 03 to 04 months after his plantation. This tuber highly appreciated for its nutritional value is rich in vitamin B6 and C, copper, manganese and potassium source (Trèche, 1997, Lyonga et al, 1985). The sweet potato

is starting to take up cassava in this part of the country after the coffee crisis of the 1990s. This tuber is one source of starch for a food security of the population. Since its domestication, this plant is currently widely spread in "in the highlands of West Cameroon" and so to become a major agricultural activity to rapid commercial peasant Santchou. This crop grew in the Santchou locality immediately after the coffee and cocoa crisis and following the closure of the 1980 SODERIM Rice Culture Society. In this area at the foot of the Santchou Escarpments. In the western Cameroon region, the emergence of this crop is recorded in this rural area located 334km from the city of Douala, which is a major consumer of this agricultural product. Today, this crop occupies the second row of tubers just after cassava and discusses the place with the potato. This tuber (sweet potato) as solicited by the population of Santchou (24,151 inhabitants) and neighboring villages is in full expansion puts in rapid commercial relationship with the city of Douala in full population growth (5% / year). As an important source of food resources, the question is what is the socio-economic impact of this agricultural product? To answer this question, we have developed a methodology based on field surveys and we have analyzed the factors at the origin of the emergence.



Map1: Localization of the field of investigation

II. RESEARCH METHODOLOGY

Our research methodology was focused on archives and oral sources. The field surveys allowed us to identify the main sweet potato production sites in Santchou, for a total of 800ha. The random statistical choice was applied to a total of 70 household heads who were surveyed. Knowing that in Santchou, 60% of the farmers produce the sweet potato, and many of which have not yet integrated as main crop, we had chosen which our population to investigate according to the place that occupies the potato in the system of peasant culture. The second phase of the survey took place in the Santchou market and the main potato collection sites in the fields. Finally, a survey was conducted at the Delegation of Agriculture and Rural Development of Santchou (DAADER), a 10-question interview guide was sent to the five coordinators of the groups of common interest (GIC) and the data were processed using Excel and SPSS software.

III. RESULTS AND DISCUSSIONS

The development of sweet potato cultivation in Santchou owes its origin to the transformation following the coffee crisis and the closure of the rice growing society, whose population has been rapidly interested in this commercial crop. In a tropical climate with the availability of agricultural land, the sweet potato crop is gaining ground in the agricultural habits of the peasants of Santchou (Figure 1). It is a local culture because of the difficulty of conservation.

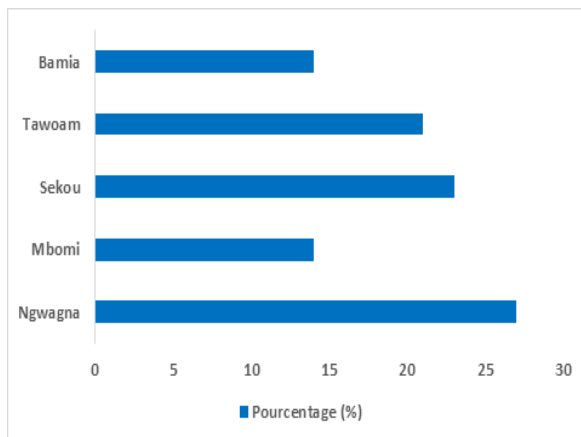
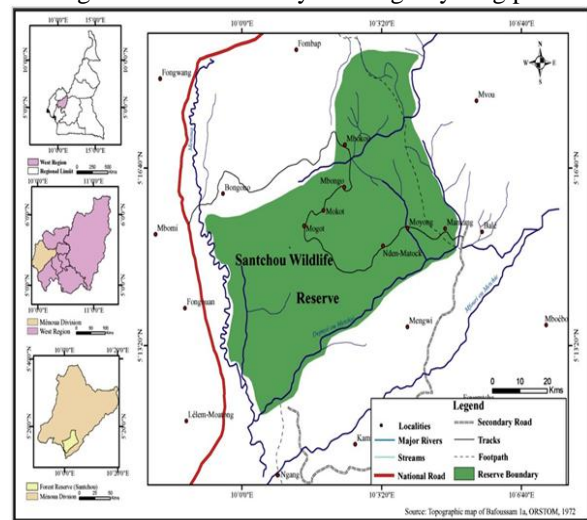


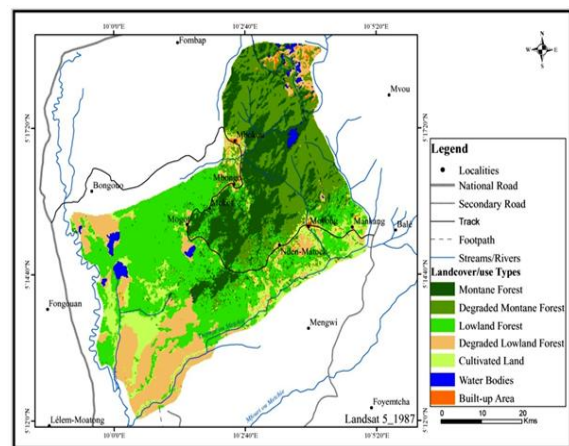
Figure 1: Distribution of the villages studied

It can be seen from this table that in five surveyed villages, the number of families remains almost constant in the sweetpotato crop. This craze for this crop follows the closure of the rice company (SODERIM) of the 1990s, which was considered the driving force for the development of the plain of Mbos (Santchou). During those glorious years, there had been a gradual and internal migration of people from neighboring areas in search of temporary

agricultural employment. Following the economic crisis, almost all sectors of activity were upset. The former rice growers of SODERIM, opted for a diversification of agricultural activities in the years 1988-1989, for the cultivation of tubers in the plain of Mbos (Bourgeon, & Latriille, 1979). Thus five groups of common interest (GIC) were created to boost production. These groupings were grouped together within a structure called Union of Joint Initiative Group of Farmers and Livestock Workers of Santchou (UGICAES) (Feudjeu, 1999). The 2010s are marked by a crisis agricultural pathology of macabo caused by a fungus that quickly attacks the leaves and tubers called Phytophthora Colocaseae causing tuber rot and even yellowing of young plants.



Map 2: The Santchou Wildlife Reserve



Source: Reeves Meli Fokeng & Vivien Meli Meli (2015)

Map 3: Land cover/use for 2013 within the reserve

A. Natural elements favoring the cultivation of sweet potato in Santchou.

In a certain climate with an average of 1759 mm of precipitation and 24.6 ° C of favorable temperature and the vast expanses of arable soil, Santchou presents natural factors for the advancement of the cultivation of sweet potato with the possibility

irrigation in the dry season to irrigate crops and it is noted that these rainfall parameters have an effect on potato tuber magnification for high productivity on average 6.5 tons per hectare depending on the season.

Another natural element that is equally important in this locality is its soil, which is predominantly hydromorphic in black color, very deep and does not have a humus level or peat (Assong-Ntoh, 2015). These soils are found not only in the urban area but also and especially in almost all the villages studied. These soils are favorable for food crops and especially for sweet potatoes (Taga, et al., 2004).

The soils rich in alluvium of Santchou are generally deep and located along the main rivers (menoua, Nkam ...) which cross different villages. The texture is essentially sandy loam loam. According to the work of the delegation of the Borough of Agriculture and Rural Development of Santchou, the soils are easily cultivable because they are light and the high content of sand favors the infiltration of rainwater and also benefits the contributions in silt from the hillsides during the months of heavy rainfall, which is why they are always fertile. Another type of soil encountered in this zone is the ferralitic soils that are found at the peripheral slopes. These soils have a high content of free iron, quartz and sand. They are well structured and favorable for tuber crops such as sweet potato because they are rich in organic matter, but this rich land, which is less demanding in terms of fertilizers, favors competition between landowners that gives rise to conflicts over land use. In this area the land is rented or purchased. The vacant land belongs to the traditional chieftaincy.

B. Agricultural spatial elements of Santchou

Santchou spread over a vast area of 316.2 km², most of which is made up of fertile plains. The apparent flatness and availability of arable land in this area is the main cause of colonization (leasing) of this area to the sweet potato crop that is beginning to replace potato and cassava (P. TCHOFO, 2017). This fertility is related to the input of silt and other nutrients from the western highlands. It appears that the former space reserved for the rice company (SODERIM) of an area of 4100 hectares consisting of plain and dotted by lakes and ponds in places. On the edge of space, former employees of the company competing in this land have created fields of sweet potatoes for commercial production towards the city of Douala.

IV. SWEET POTATO CROPPING SYSTEM

In Santchou, the sweetpotato cropping system is varied and depends on the availability of non-swampy land. It is clear that the peasants studied in general practice polyculture (60%), or in monoculture (40%). The cultivation of the sweet potato in polyculture is mainly among small producers. The later introduce

the cassava cuttings in the middle of the ridges. The system of rotation of culture allows the practice of the model of fight against parasite attacks of the tubers. The following table shows the distribution of producers according to the cropping system.

Table 1: The distribution of producers according to the cropping system.

Cropping system	Monoculture	Polyculture	Total
Effectif	28	42	70
Percentage	40%	60%	100%

Source : Field surveys (2017)

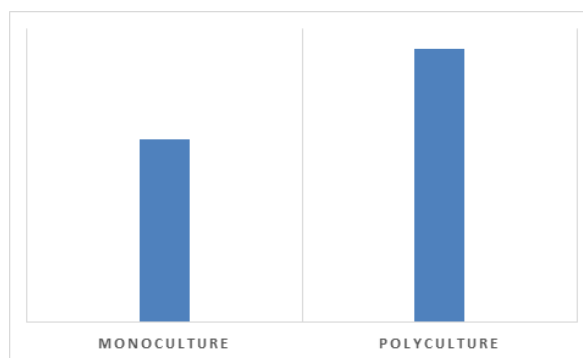


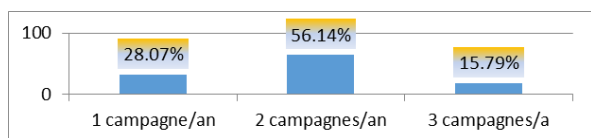
Figure 2: cultural system in Santchou (%)

This table and the curve show that the peasant population practices more polyculture (60%). This can be explained by the intense occupation of the arable land and the high prices of land rent (50000Fcf / ha) which makes that the farmers put several crops on the same ridge seeking to recover the production costs. This tuber is part of the eating habits of the local population, a large part is marketed and allows the household to meet the local need.

The agricultural calendar of sweetpotato in Santchou

Sweet potatoes need a ripening phase to reach their maximum flavor as time goes. Our results show that Santchou lends itself to all kinds of agricultural activities from its mineral-rich soil. The calendar for sweet potato cultivation is continual. Rainy season crop and dry season crop are recorded. This crop depends on the rhythm of the precipitation and is practiced almost in long of the year. The first campaign begins with the arrival of the first rains of mid-March and the harvest takes place between June and July. Then, the second cropping season that begins between late July and early August to be harvested three to four months later. Finally, the last campaign is usually carried out in swampy areas drained of water between November and December (beginning of dry season).

At the ripening stage to reach the sweet taste, the sweet potato is harvested when the leaves dry out. It is less well preserved than potatoes. The following histogram shows the distribution of producers according to the number of crop years.



Source: field surveys (2017)

Figure 3: The number of crop years per year.

This histogram shows that 28% of farmers grow sweet potatoes once a year. This percentage consists mainly of farmers who practice mixed farming, in fact they combine cassava and potato on the same plot, cassava will take over after the harvest of the sweet potato this causes competition between plants for water and the minerals. This association does not respect the production technical sheet. The 56% of farmers surveyed make two sweet potato campaigns a year. The latter practice monoculture and work mainly in areas that are away from floods. And the 14% of farmers grow sweet potato three times a year. This proportion of the population is the one that has spaces in the swamps, which allows them to do the third campaign of November-December.

Pest and sweet potato disease

Based on precipitation (1759 mm) and temperature (24.6 ° C), studies have shown that the main enemies of sweet potato are beetles, the adults and caterpillars can cause more or less damage also on foliage and tubers (Vernier & Varin 1994, Theberge 1985). Caterpillars regularly eat tubers for food. We have recorded anthrax, for this purpose the potato has black spots. Insects attack the leaves and weevils dig galleries in the stems or in the tubers. These attacks are more recorded intensely in the rainy season. Thus, rotation of crops during the crop year in the same field is recommended to prevent the occurrence of these diseases.

The sweet potato compared to food in Santchou

Although ancient, sweet potato is considered new agricultural speculation in Santchou which attracts several peasants and is cultivated by almost all social strata. Cutting seed usually comes from the producers themselves. The variety T1b1, is more solicited and is intended for human nutrition, animal and pastry. The maturity cycle is around 120 to 150 days yielding 15 to 20 tonnes per hectare. It takes 200 to 350 cuttings depending on the season for 100 m2 of cultivation is about 30,000 per hectare. According to the management of the GIC Young Farmers and Breeders of Santchou (JAGELSA), "the rush of farmers to the production of potatoes is due to the fact that it requires little financial means of 200,000 FCFA / ha to embark on this activity it adapts to soils where some crops have failed and is widely consumed by local people and cities. The following histogram shows the distribution of producers according to the duration of sweetpotato production.

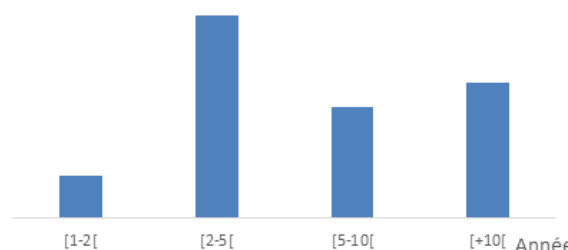


Figure 4: The number of years spent in sweet potato production

The analysis of this histogram shows that the sweet potato is more or less recent in Santchou which is evolving in space. This is justified by the fact that, 8.75% of the respondents practice this culture for two years against 41.25% who have already made five years in production, 22.50% five to ten years and 27% more than ten years in production. This activity is already attracting young farmers to take an interest. The evolution of sweetpotato production coincided with that of other agricultural holdings and the changing demand for foodstuff in urban areas (table).

Table 2: Evolution (in tonnes) and number of farmers in Santchou between 2009 and 2016.

Years	2009	2010	2011	2012	2013	2014	2015	2016
EA	1500	1600	1750	1800	1850	1950	2000	2100
PT	1440	1805	2310	3300	4600	5550	5650	6025

Source: Data collected at the Delegation of the Sub Division of Agriculture and Rural Development of Santchou, 2017.

EA= Number of farmers producing potatoes

PT : Total production

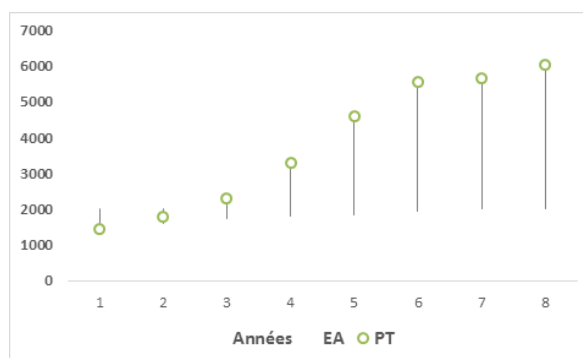


Figure 5: Evolution of production over time

The analysis in Table 3 and Figure 5 shows that there is growth in potato production in Santchou from one year to the next. Production has almost quadrupled in the last eight years from 1440t in 2009 to 6025t in 2016. We also note that this rapid growth in production has occurred despite a number of

operators who have not even doubled from 1500 in 2009 to 2100 in 2016.

Processing and commercialisation of sweet potato

Sweet potato is usually consumed after cooking, it can also be consumed fresh. Potato is a tuber that is perishable compared to potatoes. To cope with the post-harvest that is a handicap for farmers, Odaga and Wanzie in 1993 propose the transformation of potatoes into flour which is then introduced into the process of making bread, cake or biscuit. It is mainly consumed fresh (Nzietchueng, 1984). Nevertheless there is a local transformation which is very weak and which represents only about 1% of the production. Local by-products include potato chips, dried potatoes, potato koki, grated potatoes, potato porridge...

In this large production area, sweet potato is the second most marketed and the most commonly eaten after cassava. It is sold and consumed by almost all producers, among the respondents, 90% say that they cultivate the potato for sale and consumption, and only 10% of respondents do just for home consumption. The main sales and distribution market is in downtown Santchou, which is held after four days. This local market attracts a large number of wholesalers from the cities of: Dschang, Bafoussam, Melong, Nkongsamba and Douala etc.

The sweet potato is sold in the field, at home, at the Santchou market and at the Santchou toll to passengers. At this level, the sellers essentially consist of bayam-sallam women and sometimes producers themselves. The sale is done in detail with local measurement units (buckets, baskets, bales and heaps). Prices vary depending on season and quantity. On average three fillets of bags of 100 kg of flour yield a profit of about 3000 to 5000 FCFA per day. Wholesalers buy directly in the field harvests to supply the surrounding markets and the countries of the Central African sub-region, mainly Gabon, the Central African Republic, Equatorial Guinea (Platini Tchofo, 2017). These countries are major consumer markets for potatoes. The region of West Cameroon remains the largest potato production basin but this crop comes behind the potato.

The sweet potato as a factor of improvement of the local standard of living

The cultivation of tubers provides income to households in Santchou. The profit generated (100000-400000Fcfa / ha) regularly meets the needs of households. Thus, many women who recognize that it is thanks to the income from the culture of the potato that they manage to pay often the schooling of the children. In the same way, the potato contributes in the purchase of the family clothes. These last ones remain main actors of this sector. The cultivation of the potato has made couples financially independent within households. Actors of various origins in this agricultural activity testify to the difficulties of obtaining credits from microfinance. Regularly the

source of financing remains the personal effort through tontines.

For producers with agricultural land ranging from 01 to 02ha, sweet potato is considered a cash crop. This proportion of the population that represents 14% of producers practice rotation and pure cultivation. These producers deal directly with wholesalers from big cities.

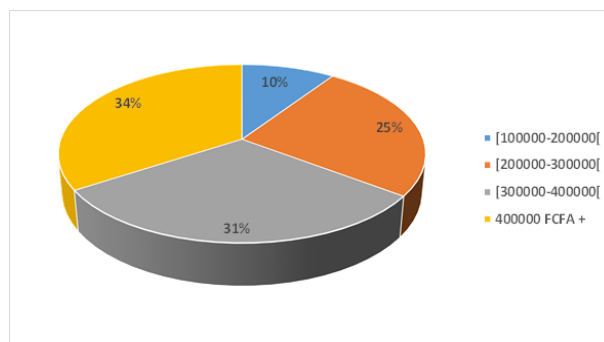


Figure 6: The average earnings distribution in CFA francs / crop year

This figure shows that 9% of sweet potato farmers earn less than 100,000 FCFA per campaign; 29% earns an average of 200,000 FCFA; 32% earns an average of 300,000 FCFA) and 24% earns between 300 and 400,000 FCFA. These results show that potato cultivation is a real source of income for producers (Pfeiffer, 1982).

This sector contributes to the socio-economic integration of young agricultural actors. In some farmers the cultivation of potatoes has become a main activity. These producers and especially those who have large areas (05ha) and little family labor call for wage labor to perform various field tasks ranging from the preparation of the field to the transport of their products (Tchofo , 2017). This daily labor is generally paid at 2000 to 3000 CFA / day or by task carried out. At the level of transport and marketing, the price of loading in bags varies according to the calibration and the cost of the labor is around 300 to 500FCFA / bags for the loading.

V. CONCLUSION

In the Santchou area, the diversity of sweetpotato (white, yellow) cultivation is a commercial agricultural product growing in all territories through different production systems: polyculture and monoculture. This crop comes in second place after cassava. It becomes a revenue-generating activity and engages more women than men. The craze for this crop follows the fall of the rice company (SODERIM), the ongoing crisis of coffee and the crisis of macabo-taro which has given way to sweet potato. This crop remains an important food resource in the western Cameroon region and plays a role in the socio-economic improvement of the local population. This sweet potato crop such as cassava is starting to benefit from an agricultural

development program. In this area, there are many varieties that differ in the shape and color of the stems, leaves and tubers. The yellow potato is very popular in pastry while the white potato is very popular with the direct consumers of the capital cities of the country. Traditional varieties are later and less demanding against plant enemies, and the results show that improved varieties are more productive in the range of 5 to 10 tonnes per hectare compared with 3 to 5 tonnes in the traditional variety. The problem recorded is post-harvest due to rapid rot relative to other tubers.

This crop meets the specific needs of households for their food, while contributing to the economic growth of farmers. The primary purpose of the agri-food sector of sweet potatoes is to contribute to pastry. This product is also used in the manufacture of poultry feed. The policy should facilitate farmers' access to extension services as well as information and facilitation of obtaining agricultural credit which will enable them to increase production.

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