International Journal of Humanities and Social Science Research
www.socialsciencejournal.in
ISSN: 2455-2070
Received: 09-09-2021, Accepted: 26-10-2021, Published: 11-10-2021
Volume 7, Issue 5, 2021, Page No. 74-81

Merchant food crops and peasant incomes in the commune of Bouake (Central Cote D'Ivoire)

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Abstract

Face with the demographic growth of towns and the various constraints linked to the supply of the town of Bouaké with food products by the peasants of the rural area surrounding the town, the question arises of knowing the gain that can get the peasant from his agricultural activity. This study aims to better understand the gain the producer can derive from his agricultural activity by supplying the town of Bouaké with food products. The research methodology used revolves around documentary research and field research through questionnaires and direct observation while remaining within the framework of Von Thünen's theory in our various analyzes. The results of this study claim that the main food crops sold by the farmers are groundnut, cassava, chilli, eggplant. The peasant income derived from the city's supply remain weak.

Keywords: supply, food merchant, peasant income, Bouaké, Côte D'Ivoire

Introduction

Like African countries, Ivory Coast has experienced rapid urbanization. The Ivorian population has grown from 6,709,600 in 1975 to 15,366,672 in 1998 and 22,671,331 in 2014 (RGPH 2014). In the same period, the urbanization rate rose from 32% in 1975 to 42.5% in 1998 and around 50% today (Atta K. L. & al 2014 p294) [1]. Bouaké city has not been spared (Map No. 1). Located between 7°69 north latitude and 5°03 west longitude, 120 km from the political capital Yamoussoukro and 379 km from the economic capital Abidjan, its covers an area of 29,250 ha. Behind the city and its extensions are the villages and hamlets. The sub-prefecture of Bouaké has 152 villages (INS, 2014). With a population that has grown from 200,600 inhabitants in 1965 to more than 536,189 inhabitants in 2014, i.e. 4.75% of the national urban population (INS, 2014). Feeding this growing population leads liberal economists to believe that it is more efficient to feed our cities with imported products at lower costs compared to local products (M'panzou B. P. & al., 2011, p143). However, this approach leads to the marginalization of transporters, traders and local food producers to the benefit of importing states. Today, if we have to feed our cities dwellers, create employment and rural development, local supply becomes of great important (Fofiri, 2013) [5], especially for farmer. However, in the rural hinterland of the city of Bouaké there are constraints related to the production, transport and sale of food croops on the markets of Bouaké by the farmers. This worrisome situation raises the following about how much income the farmer can earn from his food production by supplying the city of Bouaké? The present study highlights a particular description of the conditions under which the farmers of the rural hinterland supply the markets of the city of Bouaké with food production and, by ricochet, the gain that the producer can make from the fruits of his labor.

Tools and Methods

The documentary research was oriented around scientific works such us thesis, general and technical works, technical reports and scientific articles related to production, marketing and the contribution of urban supply to the incomes of the farmers.

The field surveys were carried out at the 'local' scale, considered as a phenomenon whose spatial extension is less than ten (10) square kilometers (Dictionnary of Geography P. George and V. Fernand, 2013); that is, at the communal scale.

Next, interviews were held with officials of the National Agency help of Rural Development (ANADER), and the National Centre of Agronomic Research (CNRA). We interviewed the managers of the Producers' Sales Office (BVP) at Bouaké wholesale market and the Food Products Marketing Office (OCPV). In addition, interviews with four (4) rural food crops suppliers were conducted on the markets of the city of Bouaké.

Sampling

Five (5) villages were selected by applying the reasoned choice technique for the selection of the localities and the target population to be surveyed in rural areas.

Localities selecting criteria: Geographical position in relation to the town, the size of the village population, the weight of food crops in the village, the presence or not of cooperatives and monitoring structures. In concrete terms, the choice of rural areas in relation to geographical position is in line with the logic of belonging to a radius of 10 km, considering the urban area of Bouaké as the center (Dictionary of Geography P. George and V. Fernand, 2013). The localities to be surveyed have been selected according to the road axes and the orientation of the points of the compass. (Map 1)

Table 1

Villages	Location	Interviewee status	Number of interviewee
Angankro	North / 7 km from Bouaké / 800 m from the asphalt	11 / 19	30
Akakro	North-East / 9km from Bouaké /3 km from the asphalt	15 / 15	30
Lokossou	South / 9 km from Bouaké / 4 km from the asphalt	07 / 23	30
Kouassiblékro	East / 10 km from Bouaké	11 / 19	30
Bendekouasssikro	South-west / 5 km de Bouaké / 4 km from the asphalt	17 / 13	30
	-	150	150

Note: In blue the number of respondents under 30 years old and those in red respondents over 30 years old.

The selection of respondents in these villages is based on their professional status, their age and seniority in farming. Thus, the individuals interviewed have the status of food producer, with a minimum age of 20 years. Our quiz was therefore administered to 150 food crop producers, with 30 producers per village. The number of 150 is justified by the insufficiency of financial resources and the control of the number of respondents for a realistic study. The analysis and processing of the data was done using Word 2016 software for the writing of the document, then Q GIS version 3.12 for the realization of the maps and finally the software Kobo Tool box and Microsoft Excel 2016 for data analysis and graphical representations. The elaboration of this work was done in the logic of the agricultural localization theory of VON Thünen (1783-1850), whose work was taken up by Jean-François T. 2020.

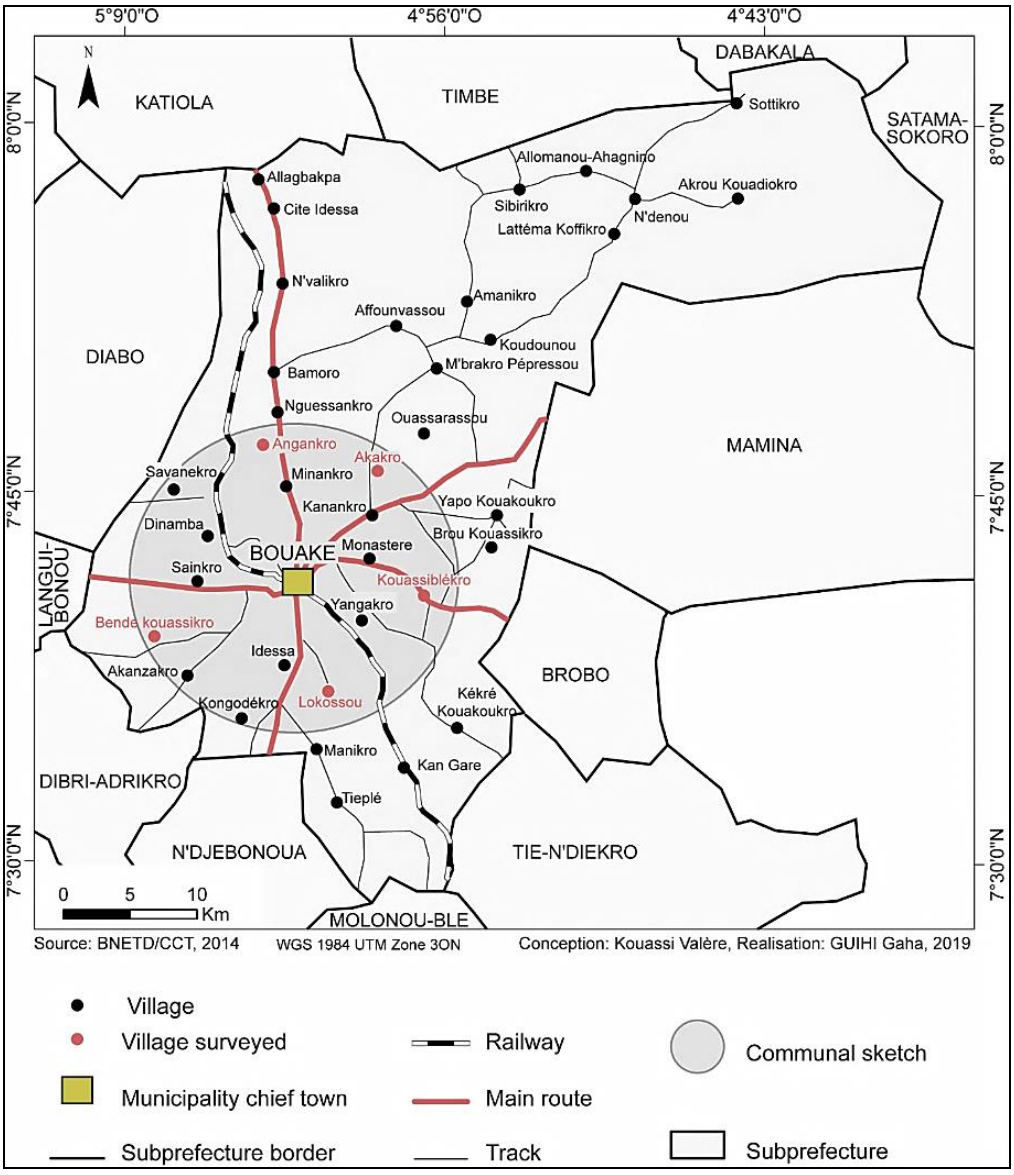


Fig 1: Presentation of the study space and survey locations

Summary of the model

Von Thünen's starting model of the "isolated state" assumes: R: Land rent; C: Cost of production (inputs, labor, seeds, etc.); P: Selling price; T: Transport cost = a × d with d= distance and a= unit transport price; hence the formula: R= (P- C) - (a × d) or R= P- [C + (a × d)]. The further away from the market, the more the land rent decreases.

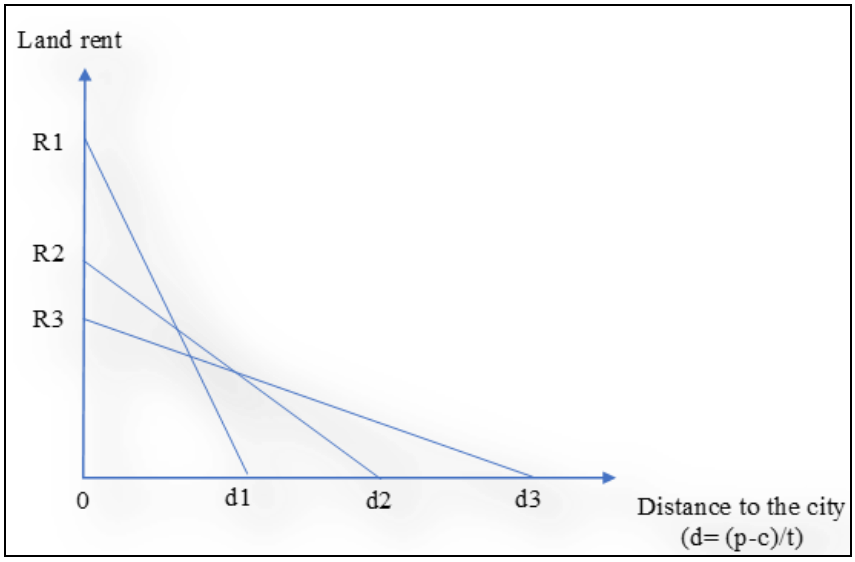


Fig 2

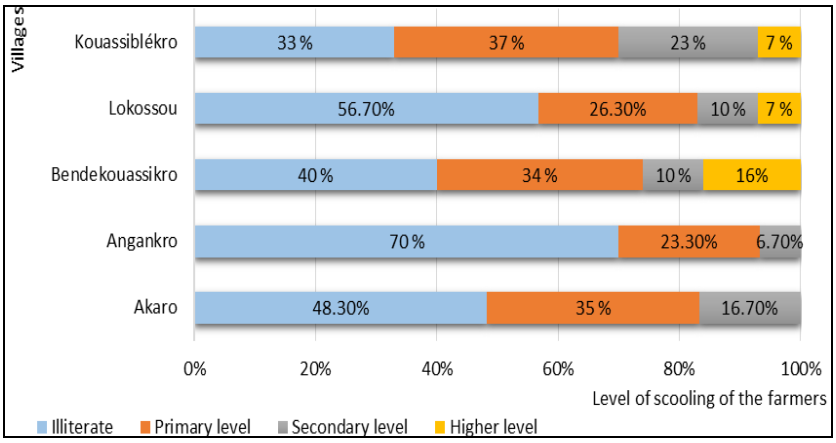
Results

Characteristics of the market food crop in the rural areas of Bouaké

Producer Profile

Food crop is practiced by the indigenous Baoulé in the study area with 96% share of the total number of respondents. These producers generally have a low level of education with a schooling rate of 51% and 78% are traditionally married.

They have an average of four (4) dependent children, three (3) of whom are in school.

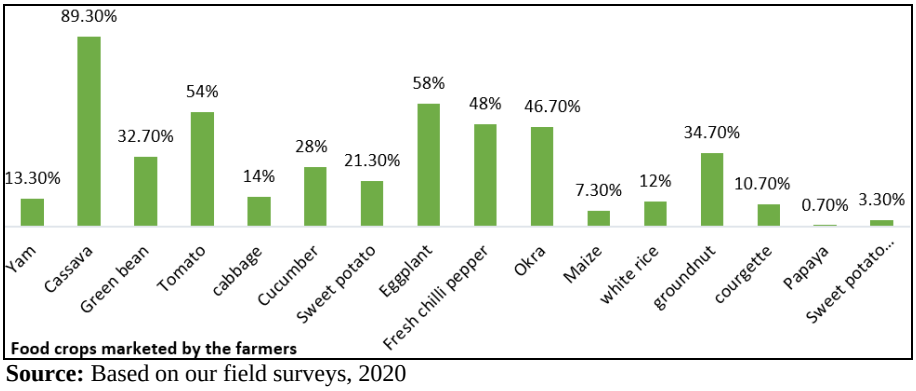


Source: Based on our field surveys, 2020

Graph 1: The farmers level of schooling per village

Crops marketed by producers

The peasants occupy their farmland with a variety of food crops in general: starchy foods, vegetables, oilseeds, and fruits. The most marketed are shown in detail on Graph n°2 bellow.



Source: Based on our field surveys, 2020

Graph 2: Comparison of food crops according to their level of commercialization

Investment in production

Location of the farming domain

Analysis shown that the localization of the domain is not made according to the distance to the market but it is rather made according to the village and the availability of the farming needs (river, land, and food for traditional breeding).

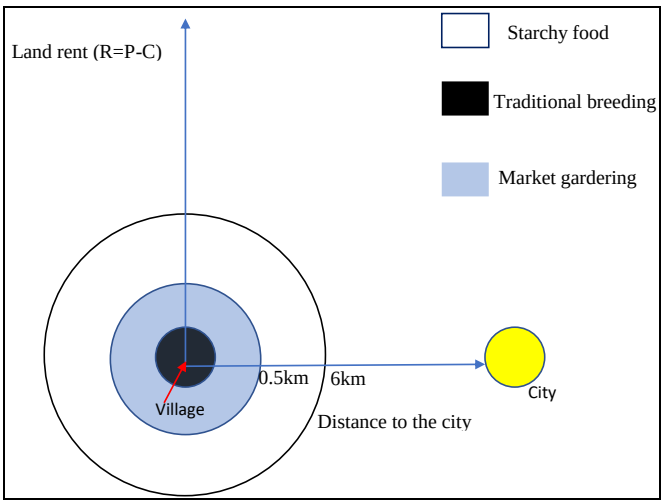
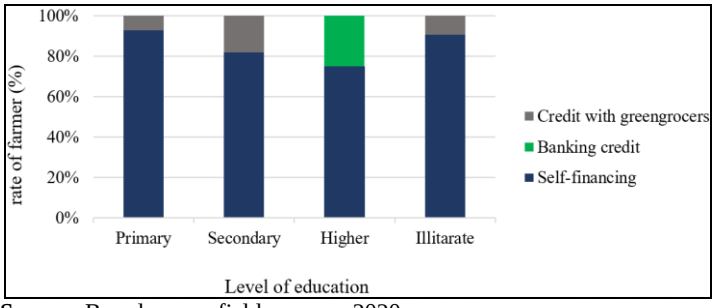


Fig 3

Source of finan cing

Bank credits are used by the farmers witch have a higher level of education (6% of producers) for they have a better understanding of the banking systems (Graph 3).



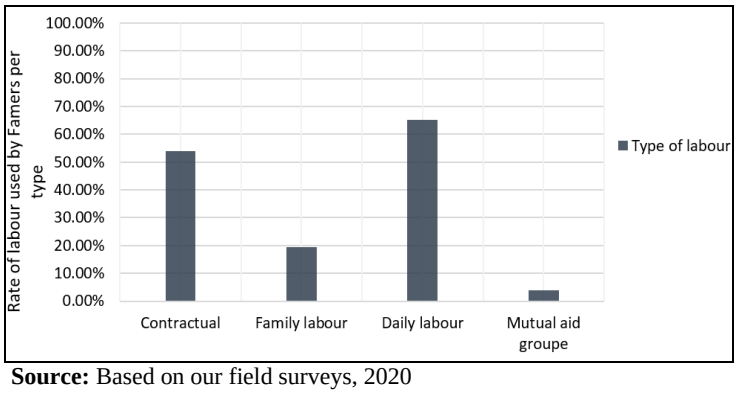
Source: Based on our field surveys, 2020

Graph 3: Comparative distribution of the sources of the producer's invested capital according to their level of education

The conditions required by the banks and microfinance are still far from the expectations of the farmers and again remain foreign to the banking system.

Labor costs

Agriculture remains traditional. And the labor force is divided into four (4) types (Graph n°4).



Source: Based on our field surveys, 2020

Graph 4: Comparison of the level of use of labor by type

The daily labor force is the most used (65%), because it is retail, therefore cheaper for the producer, since it has mostly small farms not exceeding 0.5 ha. Contract labor is used for larger plots beyond 1 square (0.25 hectare). On the other hand, the use of family labor is declining because offspring are increasingly enrolled in school with a rate of 74%. However, it must be recognized that farmers use these different types of labor concomitantly. This use depends on the agricultural area the task to be carried out, the cultivated space and its cost (Table n°1).

Table 1: Cost of labor per means of production

Means of production	Mode	acreage	Cost (F)
Hand-held	Half a day	0	1500
	Whole day	0	2000
	1 yam mound	0.25 ha = 500 mounds	15 x 500 = 7500
	1 cassava mound	0.25 ha = 700 mounds	10 x 700 = 7000
	Forest clearing	0.25 ha	7000 - 8000
yoke	yoking	0.25 ha	7000 - 10000

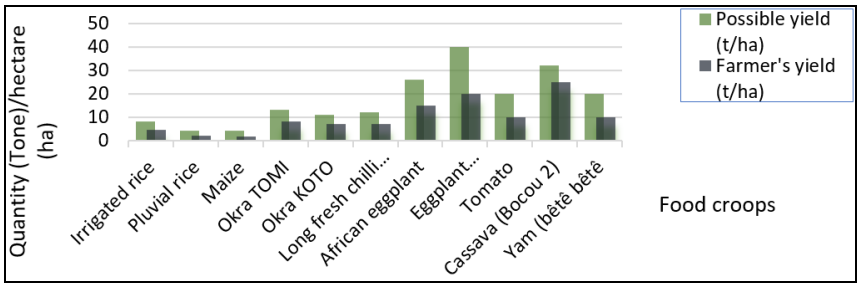
Source: Based on our field surveys, 2020

Labor costs vary according to the difficulty of the work, the economic importance of the crop, and the farm space. All these parameters contribute to low production.

Peasant yields

The agriculture practiced by farmers is not oriented towards entrepreneurial agriculture, it is rather traditional and family-based with a lack of coaching of 96% of producers by agricultural structures (ANADER, CNRA).

So they struggle to produce half of the possible yields per hectare (maximum yield) of the varieties cultivated (Graph 5).



Source: CNRA, 2016

Graph 5: Comparison of maximum possible average yields to average farmer yields

Transportation costs

As shown by the work relating to the supply of the city of Bouaké with food products by Tapé S. and al. (2020), which is, the production areas serve many market as shown on the map below (Map 2).

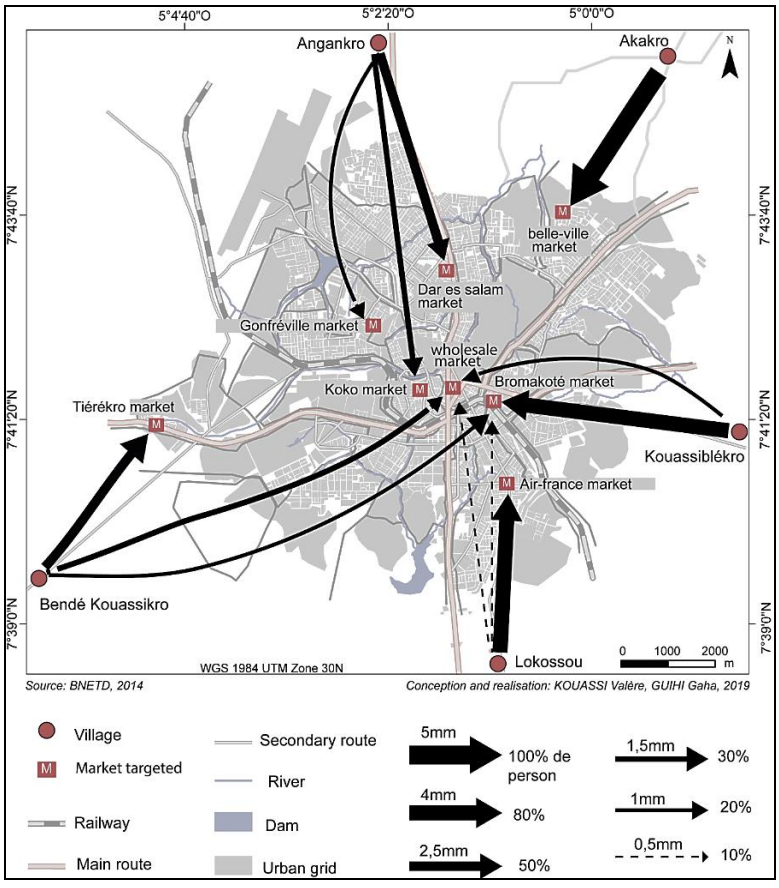


Fig 4: Flow of food crops toward the different market of the city of Bouaké

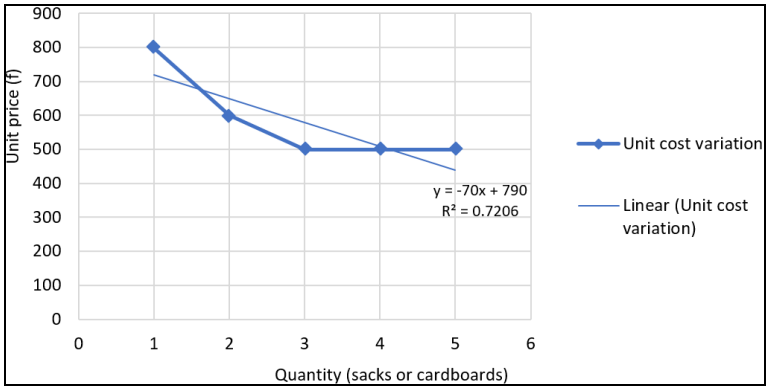
The means of transport used by producers to refuel these commercial centers are tricycles (Three (3) wheels motorcycle) (80%), covered vehicles (12%) and motorcycles (69%) (See plate) below shows the transport price of the products marketed using the two most commonly used modes of transport.

Table 2: Cost of transport of peasant food crops

Food croops	Tool used for food crops transport per unit	Transport cost by the tool used (F)	Maximal charge per machine		Cost of the maximal charge per machine (F)	
			Three wheels motorcycle	Motorcycle	Three wheels motorcycle	Motorcycle
Tomato	1 cardboard (50kg)	500	30 cardboards	5 cardboards	15 000	2 500
	1 cardboard (100kg)	1000	15 cardboards	2 cardboards	15 000	2 000
Eggplant, Fresh chilli pepper, Okra	1 sack (50kg)	500	25 sacks	5 sacs	12 500	2 500
Cabbage, cucomber, courgette	1 sack (50kg)	500	25 sacks	5 sacks	12 500	2 500
	1 sack (100kg)	1000	15 sacks	3 sacks	15 000	3 000
Cassava, Sweet potato	1sack (50kg)	500	25 sacks	5 sacks	12 500	2 500
	1 sack (100kg)	1000	12 sacks	2 sacks	12 000	2 000

Source: Based on our field surveys, 2020

Transport costs have a fixed base of 500 F, but vary (Graph n°6) according to the distance, the supply circuit and the quantity of product to be transported depending on the measuring tool used (sack and cardboard).



Source: Based on our field surveys, 2020

Graph 6: Variation of transport costs according to the unit of measurement used

Changes in transport costs affect the land rent of the farmer. The analysis of the graph above shows two (2) types of supplying circuit: the short circuit (short distance village-to-market) and the long circuit (long distance Village-market).

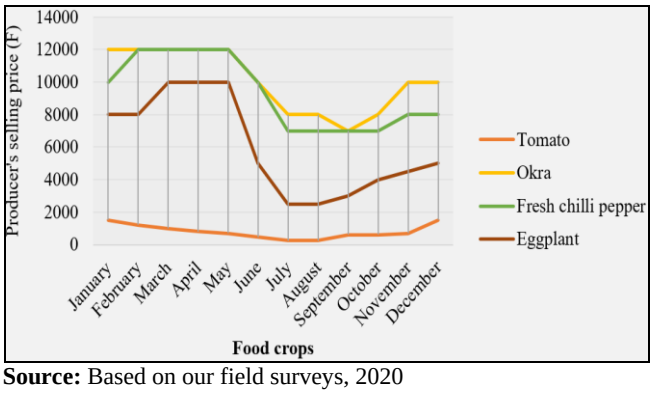
-In the short supplying circuit, when the quantity of product to be transported is important ($q \geq 3$), the cost of transport remains constant; 500 F per unit with an invariable land rent. And when the quantity of product to be transported is small ($q \leq 2$), the cost of transport per unit remains constant; 500 F per unit, hence an invariable land rent.

- In the long supplying circuit when the quantity of product to be transported is low ($q \leq 2$), the transport cost increases by 50% (from 500 F to 1000 F) which is not favorable to land rent. And when the quantity of product to be transported is large ($q \geq 3$), the cost of transport remains constant; 500 F per unit (according to the unit of measurement), which is therefore favorable to land rent.

Since fuel use is proportional to distance, the cost of transport remains constant when the number of bags or cardboards (q) to be transported is important. The greater the quantity to be transported, the greater the gain for the transporter.

Variation of the producer's selling price

The variation in the producer selling prices depends on the different production seasons. The prices are more favorable to the producer in the off-season (period from December to May) where selling prices can go up like shown on the graph bellow (Graph n°7).



Source: Based on our field surveys, 2020

Graph 7: The producers selling price variation over a year

Producers who do not have the means of production to produce in the off-season are always subject to the lowest selling prices in the region. However, the first rains start in March. Harvests are expected to last an average of three (3) months. The availability of their merchandise is therefore between the months of June and July, which is the production season (Table No. 3).

Land rent

The cost of transport depend on the quantity of products according to the measuring tool (number of saks or boxes); we note it "q". By substituting the d (the distance) of Von Thünen's model by "q" (quantity according to the measuring

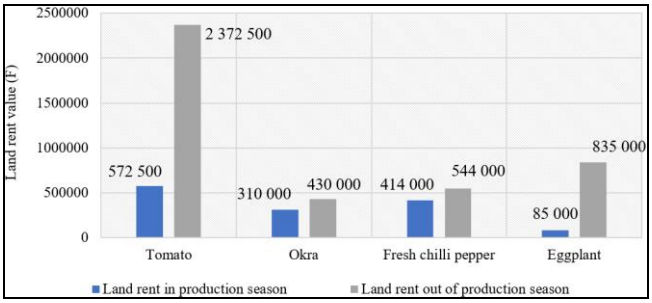
tool (cardboard or sack), T= a × q, the land rent becomes: R = (P - C) - (a × q).

Table 3: Land rents according to average farmer yields and transport costs

Food croops	Q: quantity (t) for 0,25ha	C: production cost (F)	T: transport cost a=500 F	Transport cost plus production cost (F)	Selling Unit price (F)	P: Total selling price (F)	Land rent (F)
Tomato	3t= 3 000kg	150000	27500	177500	1kg=250	750 000	572 500
Okra	2t= 60 sacs	140000	30000	170000	1sack= 8 000	480 000	310 000
Fresh chilli pepper	2t= 62 sacs	170000	30000	200000	1sack= 7 000	434 000	414 000
Eggplant	4t = 100 sacs	120000	45000	165000	1sack= 2 500	250 000	85 000

Source: Based on our field surveys, 2020

Note that these calculated profits are for one (1) production on an area of 0.25 ha if the farmer sells all his production. The incomes are still far from the possible income. If the producers were followed by the management structures (ANADER, CNRA...), and even tripled if the productions were made in off-season (Graph n°8).



Source: Based on our field surveys, 2020

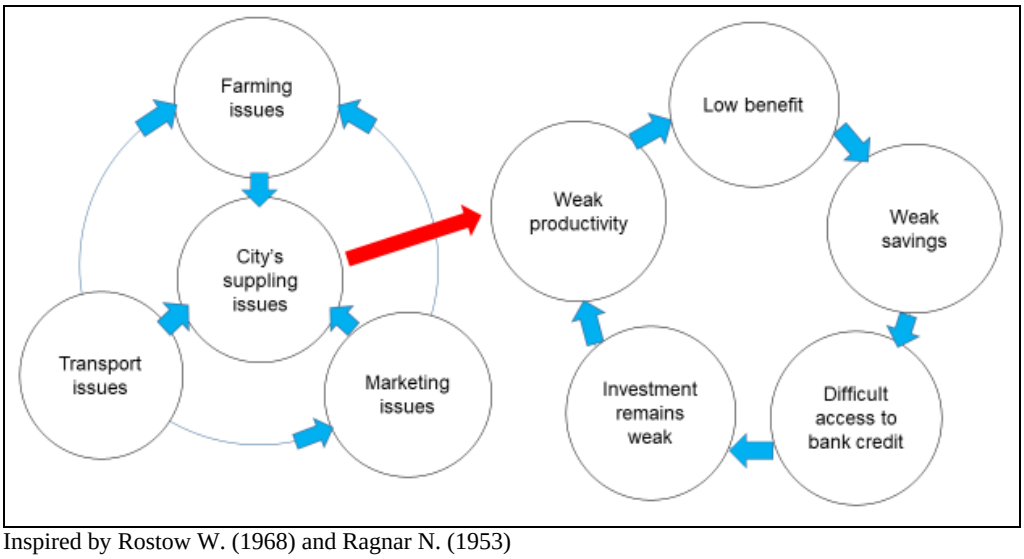
Graph 8: Comparison of farmers' incomes by production season

Discussion

According to A. Babo, (2006 p 279), agricultural incomes in this central region of Côte d'Ivoire are very low compared to those derived from perennial crops practiced by Baoulé peasants who have migrated to the forested areas of western and south-western Côte d'Ivoire. For J. Pierre (2008 p11) a farmer, enriched by the sale of yams, will have to face a significant revaluation of the social demand for consumption (ceremonies, schooling, health…) which will imply a reduction in his investment capacity and the part devoted to certain food purchases.

In the same vein, our study shows that rural production areas are still characterized by a traditional agriculture, with the use of archaic and rudimentary tools on small family farms (not exceeding 0.5 hectares). Producers do not have access to bank financing credit for their activities. These characteristics correspond to the first stage of economic growth established by W. Rostow in 1960 (p 52) in "The Stages of economic growth", where he alludes to traditional societies, to characterize the first stage of the essentially agricultural rural economy as presented by our results. As agriculture is traditional, practiced on small family areas, incomes can only be low, which does not allow them to save.

Thus, the producer remains in conditions where he cannot accumulate capital, which does not allow him to increase his productivity as well as his income. This situation drives the farmer into an environment of low productivity with perpetually low income, as described by the logic of N. Ragnar vicious cycle of poverty model (1953), repeated by H. Bass (2008 p 4).



Inspired by Rostow W. (1968) and Ragnar N. (1953)

Fig 5

Conclusion

Definitely, this study shows that the main commercial food crops grown by farmers in rural Bouaké are tomato, cassava, pepper, eggplant, okra and groundnut. However, these farmers encounter several difficulties in farming, transporting, and especially selling their products. These constraints tend to reduce the willingness of the farmer to develop his agricultural activity or to make it an entrepreneurial activity, thus forcing him to remain in a vicious circle of low agricultural productivity (see diagram inspired by Rostow W. (1968) and Ragnar N. (1953). In short, farmers supply the city of Bouaké through direct and indirect channels, with transport costs depending mainly on the quantity of product to be transported. Off-season

production, or even a fair setting of the selling price throughout the year, would be one of the possible prospects for improving the incomes of the farmer. One should note that the best conditions for the farmers to have access to bank credit have yet to be reinvented. This could be achieved by improving the relationship between traders and farmers.

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