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Exploring beyond the conjunctural rhetoric: sociocultural drivers for the "cassava crisis" in Côte d'Ivoire

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Abstract

Despite considerable improvement of food security in low- and middle-income countries over the last decades, food shortages remain persistent in sub-Saharan Africa. The driving forces are often related not only to climate change and other environmental hazards but also to socioeconomic and political factors. In Africa, food security has also assumed a strong urban dimension, raising new issues of physical and financial access to food. However, beyond the conjunctural rhetoric around unregulated food policies, social unrest, socio-economic difficulties, and environmental stresses, an emphasis should be put on socio-cultural aspects of food security. This would be possible through an analysis of "connectivities" between various stages and actors, i.e., food exchange practices between various socio-ecological spaces, and governance coordination in food security strategies. Based on a study on cassava shortage in Cote d'Ivoire in 2015-2016, this paper explores socio-cultural factors associated with food shortage in urban settings. Findings from a qualitative research approach comprising key-informant interviews and focus group discussion with various stakeholders in the cassava value chain revealed that food shortage cannot always be explained by supply/demand narratives. The study shows that cassava supply mechanisms in the Abidjan area are not sustainable as the main producers of cassava for sale are migrant workers employed in rubber plantations and whose stability in the region depends on prices of this cash crop on the international market. Regions at the vicinity of Abidjan are supplying the city with cassava but the offer does not meet the requirements of cassava-based food processors who need specific types of the product. Moreover, strategies from the municipal and government authorities to circumvent the shortage often face resistance of populations if local norms and values are not considered. In food strategies, sociocultural dynamics should be considered alongside the complex socioeconomic and environmental factors shaping the social geography of food supply in African cities.

Keywords: Cassava crisis, Food shortage, Migrant producers, Sociocultural driver, Connectivity, Abidjan, Côte d'Ivoire

Background

Overall, food security in low- and middle-income countries has considerably improved over the last decades. In sub-Saharan Africa, however, food shortages remain persistent with a rate of undernourishment of nearly 30% (Popp et al. 2019). Food crises in Africa are often related not only to climate change and other environmental hazards but also to socio-economic and political factors. The emergence of a "New Food Equation," marked by food price hikes, decreasing natural resources, land grabbing, social unrest, and climate change (Morgan and Sonnino 2010), shows the multidimensional aspect of food security in the world. Hendriks (2015) found a close interconnection between various economic, social, environmental, and political systems related to food. Eliminating one cause of food insecurity may therefore bring to light a more deeply rooted cause of which the original insecurity may have been a symptom.

Since the 1970s, the debate on food security has traditionally been polarized around two main narratives. The first one is the "productivist" discourse focusing on the supply side of the food chain and on the efficiency of the production process. The second one labeled as the "livelihood security" model, tackles the complexity of demand strategies employed by vulnerable people (Maxwell 1999). Today, the literature is promoting a new approach bridging the gap between supply- and demand-led narratives and between macro- and micro-perspectives on food insecurity (Sonnino 2016). This approach suggests to move away from the conventional focus on individual components of the food system (supply and demand) and to address the complex relationships between its different stages and actors more holistically (Sonnino et al. 2014).

At a time when most of the world's population lives in cities, food security has also assumed a strong urban dimension, raising new issues of physical and financial access to food. African cities are regularly facing food shortages as consequences of unregulated food policies, social unrest, socio-economic difficulties, and environmental stresses. Availability, access, utilization, and stability are all elements of food security. These elements are complex issues that encompass a wide range of interrelated economic, social, and political factors, internal and external, which challenge Africa's ability to address food security (Clover 2003). However, beyond the opposition between conjunctural and structural, environmental and non-environmental causes of food shortage in African cities, the sociocultural dimension that is often missing in various studies needs more exploration. A "cultural economy" dimension is important to address the complex question of food crises in African cities in a more holistic way, between various stages and actors. This involves not only focusing on social units such as individuals, households, and ethnic and social groups but also caring about the friction and "unit alliances" among them (Shipton 1990). This may be possible through a close analysis of "connectivities" (Sonnino 2016), involving food exchange nodes, governance coordination in the design and implementation of more effective food security strategies, and exchange of practices and values between culturally or geographically different groups.

The "cassava crisis" in Côte d'Ivoire in 2015-2016 offers a good example to analyze the multidimensional aspect of connectivity in urban African food security. Cassava and cassava-based foods play a major role in the population's diet in sub-Saharan Africa and contribute to food security. Cassava is an important source of energy in the diet of several African countries, including Côte d'Ivoire. It is a recognized food reserve to

prevent famine in large areas of the continent. In Côte d'Ivoire, cassava is the second most important staple food crop after yam with an annual output of 4.2 million tons in 2014 (FAO 2016). Cassava production occupies ~ 80% of the national territory (N'Zué et al. 2004). The widespread cultivation is linked to the high adaptability of this root to drought and poor soil fertility, its resistance to diseases and pests, and the ability to use a basic cropping technique during field production (Ceballos et al. 2006). Cassava is used in various forms by populations of Côte d'Ivoire, especially ethnic groups living in the southern part of the country, around Abidjan—the economic capital—and its satellite towns (Bouatenin et al. 2012). In that area where populations derive their main source of income from the cultivation of oil palm, rubber, cocoa, and pineapple, cassava farmers provided 34% of the national production in 2012. It is worth noting that the boom of rubber (white gold), providing economic advantages, and led in recent years to an unprecedented land rush in southern Côte d'Ivoire, including the Abidjan area. Local farmers usually grow cassava as a subsistence crop.

In Côte d'Ivoire, there are about 20 cassava-based products. Cassava roots can be transformed into food products such as *attiéké*[1], *placali*[2], *foutou*[3], *atoukpou*[4], cassava flour, cake, and bread. Among those products, the most widely consumed is attiéké (Kakou 2000). Attiéké is steamed cassava semolina of agglomerated appearance obtained from fresh cassava roots. The Abidjan region is the area of origin of attiéké and is the main area of its production and consumption. It is the second most-consumed food in urban areas after rice. It represents 20.5% of the calories in the food intake of Abidjan urban dwellers (Krabi et al. 2015). Nowadays, the production and consumption of attiéké has exceeded the limits of its original socio-geographical space. This cassava-based product has become one of the staple foods of various populations living in Côte d'Ivoire, especially city dwellers. With a poverty rate of 46.3%, many households are dependent on attiéké consumption because of its affordability and accessibility. The production know how of attiéké is being increasingly diffused to other parts of Côte d'Ivoire and to neighboring countries. Nevertheless, it was originally produced by lagoon ethnic groups such as Adjoukrou, Ebrié, Alladjan, Avikam, and Aizi [the term lagoon ethnic groups used several times in this paper will always refer to those ethnic groups]. The most appreciated cassava variety by producers is the traditional and bitter variety named "yacé"[5](Assanvo et al. 2006, 2000)

Originally produced for household consumption, attiéké has taken an economic importance with the ever-increasing urban demand. Today, its production as a commercial activity seems to be taking precedence over family production (Diop 1992; Mendez Del Villar et al. 2017). The high demand for attiéké in urban areas is explained by the fact that it is a fast food that can be consumed hot or cold with several

[1]Attiéké: steamed cassava semolina of agglomerated appearance obtained from fresh cassava roots according to the following manufacturing process: peeling, crushing or cutting, washing with water, grating or grinding, fermentation, spinning, shaking, pre-drying, flotation/sieving, winnowing, and steam cooking (CODINORM 2013).
[2]Placali: It is the fermented cassava pastry (rapport d'étude, Chambre de commerce et d'industrie en Côte d'Ivoire 2014).
[3]Foutou: It is the result of the grinding of tubers cooked with water (rapport d'étude, Chambre de commerce et d'industrie en Côte d'Ivoire 2014).
[4]Atoupkou: It is a variant of the attiéké (rapport d'étude, Chambre de commerce et d'industrie en Côte d'Ivoire 2014).
[5]Yacé: It is the local name for a traditional cassava variety.

accompaniments. Even if several semi-industrial production units have stepped into the business, the production of attiéké is still dominated by artisanal know how. The activity is mainly led by women among whom two-thirds are working in the informal sector living from the production and sale of attiéké (Bouabre 2012). Attiéké represents 50% of the basic foods of the populations living in the Abidjan District, 47% of them consuming it at least once a day (Anoh 2016). It has become part of the identity of Côte d'Ivoire and large quantities are exported to neighboring countries (e.g., Burkina-Faso, Mali, Guinea) and in Europe (e.g., France, Belgium, Germany) (Yobouet et al. 2016). Exports of fresh attiéké rose from 1741 tons in 2009 to 363,548 tons in 2013 (Chambre de Commerce et d'Industrie de Côte d'Ivoire 2014).

With this growing demand for attiéké and the rapid growth of urban populations, several measures have been taken in the agricultural sector in Côte d'Ivoire, by policy-makers and researchers, to ensure the availability and accessibility of cassava and cassava-based foods. Research has, for instance, resulted in the selection of new varieties of cassava that are more efficient in terms of yield, disease resistance, harvest time, and nutritional qualities, such as Yavo, Bocou 1, 2, and 3, and TMS4 (Bakayoko et al. 2012; Champagne 2010; Ebah-Djedji et al. 2013; Kouadio et al. 2011). Studies on the technical itineraries of cassava have therefore contributed to the optimization of productivity and to increase the opportunities for the production and marketing of cassava. In addition, studies have shown that fresh cassava, soaked in water heated to 65 °C for 15 to 30 min, can be stored in pits or sawdust boxes for about 14 days, which helps to minimize post-harvest losses (Akely et al. 2016). Scientific findings have contributed to an increase in national cassava production in Cote d'Ivoire with 4.2 million tons in 2014 and 5.1 million tons in 2015 (FAO 2016).

In spite of all these efforts, a shortage of cassava and cassava based-foods has been observed on the Ivoirian markets since 2015, particularly in the Abidjan region. This resulted in a dramatic and sustained increase of cassava prices and cassava based-foods around February 2016 (Mendez Del Villar et al. 2017). Indeed, prices rose to a level never reached before in the country, restricting possibilities of poor households to buy those foods for their daily needs. The price of one ton of cassava rose from 68.60 € in December 2015, to 106.71 € in April 2016 representing an increase of 55.6% within 4 months. This surge in cassava price is reflected in the price of cassava-based foods. The price of a basket of attiéké (corresponding to 15-20 kg) and that of a garba[6] ball (corresponding to 45-50 kg), for instance, doubled respectively from 4.57 € and 7.62 € in December 2015 to 9.15 € and 12.20 € in April 2016. Similarly, the retail price of 1.5 kg of attiéké, rose from 0.38 € to 0.76 € and a portion of garba increased from 0.08 € to 0.15 € (Anoh 2016; Kouadio 2016). The cassava crisis caused a lack of basic food for the local population and for consumers of cassava-based food in the Abidjan area. Several explanations have been provided by different stakeholders for the causes of the sustained cassava crisis despite increased production in recent years with new technologies. In his 2016 Labor Day address, the Head of State of Côte d'Ivoire, for instance, named multiple explanatory factors for this phenomenon. These factors are the severe

[6]Garba: It is a type of attiéké whose production excludes certain processes of manufacturing attiéké (fermentation, sowing, winnowing). Its production is aimed at the masses of relatively unattractive masses (pupils/students, adolescents, unemployed) and is marketed in numerous make-shift outlets throughout the city of Abidjan (Krabi et al. 2015).

drought that occurred in the country; speculation through sales beyond homologated market prices; and the new land rush with the increased cash crop cultivation resulting in the replacement of cassava farms by rubber plantations. This statement at the government level was framed by analyses and conclusions of administrative authorities, including those from the Abidjan District (municipality). The major solution suggested by those authorities was to subsidize producers in central Côte d'Ivoire to increase cassava production. The government aimed to contribute to a better supply of the attiéké production units in the south (interview with Abidjan District Communication Officer 2016). External assessments of development actors, media, and non-governmental organizations (NGOs), have reported climate change, intrusion of new players into speculation and market distortion, lack of manpower, and high international demand to be among the causes of the shortage. All contributions and analyzes revolve around natural hazards and the intrusion of new actors into the sector as well as scarcity of arable land.

Elsewhere in Africa, research has identified several similar factors explaining food shortages in various contexts. Those factors include climate change, natural disasters, rising food prices (e.g., for rice and wheat), and armed conflicts. For example, the Sahelian food crisis in 2008 was linked to several factors such as natural hazards (drought, pest, and locust attacks), the sharp rise in Asian rice prices, and the spatial and economic competition between crops (Janin 2010). Similarly, the food crisis in Niger between 2004 and 2005 was related to the scarcity of arable land, the disappearance of fallows, and the depletion of cultivated land combined with the rapid population growth. Moreover, the crisis was attributed to the dysfunction of the sub-regional cereal market, particularly between Niger and Nigeria (Olivier de Sardan 2007). Apart from environmental hazards and economic conditions, some authors also noted that food crises affecting Africa are increasingly explained by the escalation of armed conflicts (OXFAM 2006; Doka et al. 2014).

The factors behind the crisis can only be partially explained by environmental, economic, and sociopolitical factors. There is a need to explore beyond the conjunctural or cyclical factors that are no longer sufficient to explain food shortage in the African context. Socio-cultural aspects not only in terms of practices and values of people but also in terms of frictions and "unit alliances" (Shipton 1990) among various actors of food value chain have not been deeply analyzed, so far. Concerning the cassava crisis in Côte d'Ivoire, it is critically important to analyze connectivities between places, markets, policies, and people. Firstly, using the geographical perspective (places), to assess the mobility of goods and manpower as well as availability of land. Secondly, as for the markets, rural/urban, and local/global nexuses should be considered. Thirdly, analyzing connectivities in food policies take into account governance coordination in the design and implementation of more effective food security strategies. Finally, cultural aspects such as people's interactions and alliances, values, and identities are critically important. Based on the assumption that cassava production and cassava-based foods in Côte d'Ivoire and especially in the Abidjan area is deeply linked to the socio-cultural context of indigenous peoples, this paper aims to explore the socio-cultural causes underlying the shortage of cassava and cassava-based food. This will consist to question the following:

- The place of cassava production and cassava-based food in the social system of communities.
- The role played by migrants in cassava production in southern Côte d'Ivoire and especially in the vicinity of Abidjan.
- The social perceptions associated by cassava processors (women) in the Abidjan area to cassava varieties.

Methods

Study site and justification

The study took place in two main areas in Côte d'Ivoire, the coastal region south of Abidjan, and the savannah woodland in central Côte d'Ivoire. These two agro-climatic areas are characterized by differences in terms of the objectives of cassava production. In the South, surveys were conducted in the Abidjan District and in satellite towns like Dabou, Alépé, and Bonoua. In this document, the whole southern area is referred to as "Abidjan area." As for the center, the survey was conducted around the city of Bouaké and Toumodi town. Those two localities will be referred to in the paper as "Centre" (see Fig. 1).

The choice of the Abidjan District is mainly justified not only by its position in the market of cassava and cassava-based products but also as one of the major cassava production areas (Krabi et al. 2015). Most of the cassava processing units are located in the Abidjan area. The central region is currently perceived as a new cassava production area. Farmers in this area have been recently encouraged and supported through the creation of producer cooperatives to produce cassava in large quantity mainly to supply the southern market. Based on the estimates of the RONGEAD report in 2015 cited by Mendez Del Villar et al. (2017), the Abidjan area and the central zone are the two main production regions of cassava in Côte d'Ivoire. Even though other regions are

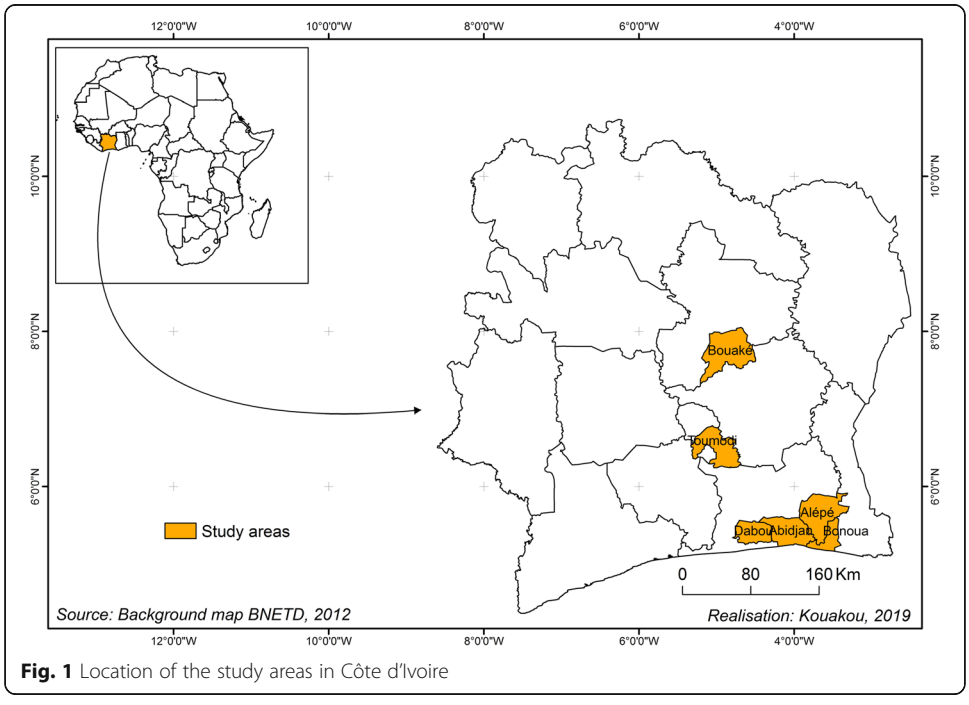

Fig. 1 Location of the study areas in Côte d'Ivoire

increasing their production, those two zones represented until recently about 50% of the national production: 33.97% for the coastal area around Abidjan and 18.05% for the Bouake zone.

Data collection processes

The fieldwork for this research took place in both zones in July and August 2016. The data collection process was based on a qualitative approach including focus group discussions (FGDs) and key informant interviews (KIIs). Informants were sampled based on their characteristics and representativeness in the cassava value chain. The entire sample was selected using the snowball technique, informants being asked to connect the researchers to other persons with the same characteristic (Loubet Del Bayle 2000; Mongeau 2008). After the oral consent of each selected informant to participate in the study, the interview was conducted with the help of an interview guide and recorded on a digital voice recorder, accompanied with notetaking. For KIIs, one-on-one discussions were engaged with individual informants to gather information on perception, opinion, and attitudes regarding production and marketing constraints of cassava. For this study, 22 face-to-face interviews were conducted with cassava producers and cassava-based food processors.

The FGDs consisted of a group discussion gathering together people from similar backgrounds or experiences to discuss on the place of cassava production and cassava-based food in the social system. The role of migrants in cassava production in southern Côte d'Ivoire and the social perceptions attached to different cassava varieties were also explored in the discussion. A total of 16 FGDs were organized with cassava producers and cassava-based food producers in both the Abidjan area and the central zone.

The selection of informants respected gender differences in both areas and involved various actors of the cassava commodity chain (see Table 1 for the summary of data collection techniques and categories of informants).

After the fieldwork, all the discussions were systematically transcribed in Microsoft Word 2013 to keep a verbatim record of the discussion. Various transcripts were then imported and coded on MAXQDA 10, a qualitative data processing software. The coded data from the transcripts were analyzed to find repetitive patterns of action. Those patterns helped to summarise various categories emerging from the data. Based on a thematic content analysis, four main themes emerged, constituting the baseline of the following results:

- Location of cassava production among populations in the Abidjan area
- Non-adoption of cassava cultivation as an economic activity by the people of the Abidjan area
- Role of migrants in cassava production in the Abidjan area
- Non-adoption of improved varieties of cassava in the Abidjan area to produce attiéké

Results

Cassava production in the Abidjan area characterized as an activity for women

In the Abidjan area, cassava production is a social activity, structured around local values and norms. The production is intended for household self-consumption. The

Table 1 Summary of techniques and categories of interviewees in this study

Study site	Data collection technique	Informant characteristics	Number
Abidjan City: Abidjan District	FGD	Attiéké production cooperative society	**2**
		Cassava traders' association	**2**
		Cooperative society of women traders attiéké and placali	**2**
	KII	Attiéké producer	**5**
		Attiéké and placali trader	**5**
		Cassava trader	**5**
Abidjan area: satellite towns (Dabou, Alépé, Bonoua)	FGD	Cooperative of cassava producers	**6**
	KII	Cassava carriers and distributors	**2**
Central zone: Toumodi and Bouaké	FGD	Cassava producers	**4**
	KII	Cassava producers	**5**
Total number of interviews			**38**

FGD focus group discussion; *KII* key informant interview

social division of the labor in the region ascribes the production of foodstuffs to women while men invest their time on activities related to cash crops production. Among native people, cassava fields are mainly cultivated by women to cover the food needs of their households. The plots are generally of small size and do not exceed 1 ha. Growers prefer traditional varieties that they inherited from their mother or grandmother. This is justified by the fact that the cassava they produce is used to make attiéké, which is their staple food. Those traditional varieties of cassava are characterized by their bitterness and can only be consumed after the transformation process. Cassava production is therefore linked to social status in the Abidjan area. Men usually possess a field of rubber trees, oil palms, etc., to satisfy the financial needs of the household. For women, the possession of a cassava farm will ensure the availability of food in the household throughout the year. Among lagoon peoples, cassava production and processing have a more social than economic value. The social recognition of a woman is related to her ability to own a cassava field, while the status of a man increases with the extension of his rubber or cocoa farm. This antagonist form of social mobility within the household explains why native people do not produce cassava for trade despite a high urban demand. They are more inclined to invest on cash crops at the expense of cassava that has no social value for them. For lagoon people, "a man cannot say that he has got money producing cassava because he will be perceived as someone who is unable to compete with men and therefore comparable to women (…). He will lose his social position because cassava's work is for women. We will say that he is a woman and he will no longer be able to speak in a men's assembly" (FGD, attiéké producers in Dabou July 27, 2016).

In this regard, local ideologies and worldviews constitute a major constraint in cassava production in the Abidjan area. With the rapid urbanization of Abidjan, rural and urban areas are well connected in terms of food exchanges. With this "connectivity" between these social spaces, cassava production and processing has become a real economic activity. This context offers numerous economic opportunities to farmers in the vicinity of Abidjan to produce cassava and cassava-based products to satisfy urban demand. Individually or in groups, women are increasingly involved in the commercial

production of cassava and attiéké in the Abidjan area. The local government has supported several initiatives by empowering cassava producers and processors through financial and technical assistance. However, those efforts are hampered by social considerations and land issues. In spite of the urbanization process, populations from local ethnic groups remain committed to the social values underlying the production and consumption in their community. As cassava production is linked to social status, men reluctantly engage in this activity. Women involved in cassava production are not entitled to land. Even when they desire to increase parcels of cassava for sales, they are constrained by limited access to land. Men who detain the quasi-exclusive right on traditional rural lands, prefer to invest in cash crops or to lease land to migrants for gardening or food crops production for direct cash.

The current food policies are not yet well connected to local social realities. As informants recognized, efforts from the local government to improve the productivity by organizing producers and subsidizing farmers and processors do not take into account various aspects of the social organization. The uncontrolled land rush for rubber production and difficult access to land for food crops production are key driving factors to food shortage. The social division of the labor is not yet accompanied with a subsequent land entitlement for women. The power games concerning the management of natural resources (land) are still largely in favor of men and many opportunities are left to migrants.

Migrant workers in cassava production in the Abidjan area

Contrary to the native people of the Abidjan area, cassava production is perceived by migrant producers as an economic opportunity. Since the beginning of the twentieth century and more precisely after the independence in 1960, the whole of southern Côte d'Ivoire registered the immigration of thousands of migrants from hinterland countries like Mali and Burkina Faso. They were recruited for enhancing manpower in cash crop plantations. In the Abidjan area, most of those migrants were hired to work in rubber plantations, the dominant cash crop plant. They are remunerated either per semester or after each harvest season. In order to satisfy daily economic needs of their families, they request or rent plots from their landlords for cassava cultivation. The harvest is sold on the ever-growing Abidjan market, benefiting landowners for several reasons. First, the salary of the workers is often compensated in kind by the rental arrangements on the plot leased for cassava cultivation. The advantage in this transaction is that the landlord is sure to keep his workers for a longer term, at least until the harvest of cassava is completed. Secondly, in some cases, leasing agreements take the form of "plant and share" arrangements where harvest is shared between the landlord and the tenant. Native people described those arrangements as a win-win process: "we give the land to our workers for other activities during their free time (...), they usually grow cassava there, and after harvesting they give us our share and sell their own share. Doing that, they have some money on them while waiting for their salaries (...) in any case, it suits everyone and everyone wins" (FGD, attiéké production group, Alépé, July 24, 2016).

Thus, an exchange of practices and values has been created between migrant producers and native people. They rent the land to migrants who produce cassava because there is no negative social perception attached to this activity in their culture. Through the arrangements with migrants, native people are able to benefit from the economic advantages of cassava production without farming their own plots. Migrants generally sell their harvest in the Abidjan market where prices are higher. In the Abidjan District, they have a monopoly in the sale and distribution of cassava. The privileged relationships between landlords and migrant workers have contributed to a substantial increase in the number of cassava fields around Abidjan. Open spaces close to rubber plantations are systematically covered by cassava.

It is worth noting that in the close vicinity of Abidjan, even if migrant growers have the possibility to plant improved cultivars, they surprisingly stick to traditional varieties used by native peoples. This choice is explained by the necessity to produce varieties that match the demand of the attiéké market, new improved varieties being not suitable for this sub-product. The increase of areas cultivated with cassava around Abidjan is mainly the result of the inclusion of men in this type of farming. Due to the profitability of the production of this food crop, it is no longer only a woman's task as prescribed by the social division of the labor in the area. Migrants are not part of the sociocultural system of local ethnic groups, and men have no problem producing cassava for sale. Their social position is not affected by their new activity and the whole family is involved in the production of cassava for the market. The arrangements between people from those two culturally different social groups have contributed in recent years to increase the offer of cassava roots in the Abidjan market, even though the supply was still limited.

However, with the drop in rubber prices in recent years, many migrant workers have left the area as the result of difficulties of plantation owners to pay salaries. The crisis was so hard that leasing arrangements on the plots for cassava cultivation could no longer be an incentive to avoid the resignation of workers. Their expertise was no longer required on old unproductive rubber farms, especially in an area where the creation of new rubber plantations has become difficult due to the scarcity of arable land and lack of investment. In search of new contracts, many employees relocated to areas like Aboisso, Alépé, or Bonoua. In those localities, rubber plantation is combined with kola, cocoa, and pineapple cultivation. Those who remained in the vicinity of Abidjan have moved into other economic activities. This outmigration of workers was more pronounced in Dabou, where the main cash crop is rubber. Native attiéké producers in the area confess that "today, we do no longer have cassava herebecause the Burkinabe [migrant workers from Burkina Faso] left. They were the ones who produced more cassava here, they had the largest cassava fields and it was since they left that we started feeling the lack of cassava" (FGD, attiéké producers in Abidjan area, Dabou July 27, 2016).

The rubber crisis on the international market indirectly affected the production of cassava in the Abidjan region. It resulted in the outmigration of workers who constituted the main suppliers of the Abidjan market. The collaboration between migrants and indigenous people that promoted the availability of cassava no longer exists in this area. As consequence, the supply is decreasing in the Abidjan market. The remaining

cassava fields are mainly owned by native people whose supply cannot meet the market demand.

Non-adoption of improved cassava varieties by attiéké women producers in the Abidjan area

The crisis in cassava and cassava-based foods can also be explained by the level of acceptability of certain cassava varieties by attiéké producers. In the Abidjan area, most of the female producers of attiéké are from lagoon ethnic groups. Those women prefer to produce attiéké with traditional varieties of cassava. They perceive improved cassava varieties as not suitable to produce good quality attiéké. The production of attiéké is a social activity, structured by endogenous norms and practices. This local knowledge and know how are passed on from generation to generation. The idea that attiéké of good quality can only be made with traditional varieties is still persistent in the collective consciousness of the producers, therefore they reluctantly use improved varieties of cassava in attiéké production. An attiéké producer in the Abidjan District justifies the use of cassava varieties saying that "In our village, we usually know Yacé [a local cassava variety]. It makes the best attiéké, and we use this cassava as have our parents before us done, and it makes the best attiéké. For example, when you use an improved variety of cassava to make attiéké, it spoils quickly. The taste and color are not the same as of attiéké produced with cassava from Yacé variety" (FGD, attiéké producer, Abobo-Doumé, July 25, 2016). There is therefore a selective use of cassava varieties by attiéké producers in the Abidjan District. This attitude is opposed to food security strategies for cassava self-sufficiency in Côte d'Ivoire that encourage the adoption of improved varieties for their adaptability and productivity.

The non-adoption of improved varieties by cassava-based food producers shows that the availability of cassava does not guarantee its use. Under the impulse of migrant workers and local populations, several areas such as Bonoua and Alépé have become the main cassava production areas supplying the Abidjan market. Those zones have gradually been transformed into areas for the production of improved varieties of cassava. The choice of improved varieties in those zones is justified by land pressure and the high productivity. In the context of high demand in land for cash crop cultivation, there is increased land speculation and landlords reluctantly accept long-term leases. Migrant farmers opt for improved new cultivars with short cycles. They are able to use their plots twice a year, which allows them to maximize their economic benefits. Informants from Bonoua indicated that the number of plots dedicated to the production of traditional varieties of cassava mainly used for attiéké in Abidjan is drastically decreasing. Landless cassava producers complain as "Often, when we grow a traditional variety of cassava, after a few months the owner of the land comes to ask us to remove the cassava because he needs his land. We are then obliged to plant new varieties of cassava that have a short production cycle" (FGD, migrant cassava producer group Bonoua, July 29, 2016). Thus, the adoption of new cassava cultivars by producers will increase the offer in the Abidjan market, but the absorption by local food processing groups is not guaranteed as the quality does not meet their requirements. There is no link between the quality of the supply from cassava producers and the needs of attiéké producers in the Abidjan District.

The discrepancy between the quality of supply and demand is also observed with cassava produced in the central area of Côte d'Ivoire. In areas like Toumodi and Bouaké where the staple food of the population is yam, cassava is cultivated for commercial purposes. Under the impulse of the government, farmers have been encouraged to invest in this activity to ensure the supply of the Abidjan market. Agricultural extension workers encouraged farmers to adopt improved varieties because, in addition to their short cycle and high productivity, they are more resistant to adverse climatic conditions and diseases than traditional varieties. In this area, contrary to the coastal regions of the south, cassava cultivation is not linked to social status; everyone can be involved in the activity, irrespective of age and gender. During the period of cassava shortage in Abidjan (2015-2016), some policymakers were further encouraging cassava production in the area to increase their offer, in order to quickly address the shortage in the south. However, the quality of supply did not meet the standards of southern cassava food-based producers (attiéké). Despite the strong demand in Abidjan, the production from the central zones was not absorbed and selling prices remained lower than those of traditional varieties. As one cassava trader recognizes, "when it was announced on the TV that cassava was expensive, the price of a car load (a pick-up, i.e. about 3 to 3.5 tons) of yacé [local variety] had reached 260'000 CFA Franc (396.4 €). Meanwhile, the same quantity for chikaya[7] [improved variety] was 150'000 CFA Franc (228.7 €) only (...) but nobody even wanted to take that cassava" (Interview cassava trader, Abidjan, July 26, 2016). Despite the availability of cassava in the center (Toumodi, Bouaké), this did not alleviate the shortage of cassava in Abidjan. This situation is explained by the social differentiation of cassava varieties by the main cassava users and the inadequacy between public food security policy and cassava food production practices in the South.

Discussion

Findings generated in this study question the dynamics of the urban foodscape in sub-Saharan Africa understood not only as urban food environments but also institutional arrangements, cultural spaces, and discourses that mediate the relationship with food. Beyond cultural values and policies governing food production and distribution, discussions should revolve around the concept of "connectivities" comprising the role of food exchange channels between connected spaces and the governance coordination in the design and implementation of more effective food security strategies (Sonnino 2016: 190). Analysis of narratives embedded in the findings on the cassava shortage in Côte d'Ivoire suggests two main directions for further discussions: the renewal of the social geography of food supply and new urban food governance.

Renewal of the social geography of food supply

The cassava crisis in Côte d'Ivoire can be explained by factors such as local ideologies and worldviews around the social distribution of tasks following the gender divide and acceptability of varieties of cassava. Findings revealed that cassava production among native communities around Abidjan is mainly a female activity, men investing more in cash crops. This observation is confirmed by Perrin (2015) who explains in a study on cassava commodity chain in Côte d'Ivoire that cassava production is essentially a

[7]Chikaya: It is the name that local people have given to an improved cassava variety.

female activity, each woman cultivating an individual plot for her household. Even if the areas devoted to cassava cultivation generally vary between 0.01 ha and 4.0 ha in the country (Djaha et al. 2018), farms in the vicinity of Abidjan are of small size, and women are often organized into work self-help groups (Perrin 2015). However, the results contrast with the findings of Djaha et al. (2018) on the analysis of the population structure of cassava growers. Based on a survey in various agro-ecological zones of Côte d'Ivoire, they concluded that a significant proportion of growers are men in the North, South, East, and West, except for the center where the proportion of women is higher (Djaha et al. 2018). This contrast is explained by the increasing "intrusion" of men in the production of cassava roots throughout the country. Even though recent reports mention the domination of women in the whole cassava commodity chain, representing 80% of actors (Mendez del Villar et al. 2017), men from regions where there is no social perception attached to food crops production, contrary to the lagoon people, are actively taking market shares from women.

One of the major drivers of the cassava shortage on the Abidjan market is the low connection between innovative practices and local context and know how. Findings revealed that the shortage on the urban market is often due to the quality of the supply than the quantity. There is no correlation between food security strategies and local norms of attiéké production. Indeed, the strategies promote improved varieties with higher yield while local norms of attiéké production are in accordance with the use of traditional varieties. Yet, the major part of cassava produced is transformed into attiéké and the main actors of this activity prefer to use traditional varieties. In the lagoon region around Abidjan, the production of those varieties is transmitted from generation to generation in accordance with socially anchored cultivation techniques. Their use for the production of cassava-based food has been instilled during their socialization process. One of the traditional varieties mostly used in the region of Abidjan to produce attiéké is the "yacé" variety. Thus, when producers find cassava varieties on the market that do not meet their requirements, they do not use them.

There are social values attached to the production and use of a specific variety of cassava in accordance with the perceptions, ideological conceptions, and the level of knowledge of population. As recognized by Lida et al. (2016), the choice of varieties to cultivate is determined by its means and production objectives. As far as the choice of new varieties of cassava is concerned, social distance, incompatibility with existing norms, values, and practices are ideological productions that explain the relationship of cassava producers to innovation (Lida et al. 2016). In the same line, Brootcorne (2011) demonstrates that rejection of the introduction of news agricultural practice in the Wallonia region (Belgium) such as agroforestry was justified by the perception that it is incompatible with their production mode and found that the administrative constraints related to this innovation were too heavy. For Blazy, banana growers in the West Indies did not adopt the use of rotating service plants as improved technique because of the lack of technical expertise required to manage this innovation. Other reasons concerned the small size of the plots and the lack of land ownership (Blazy 2011). Kaliba et al. (2018) pointed out similar reasons in Tanzania concerning innovation in sorghum cultivation. They showed that some farmers have not adopted certain improved sorghum varieties due to a lack of basic resources such as land and capital as well as a lack of assurance on the performance of improved varieties (Kaliba et al. 2018).

However, other studies have shown more encouraging outcomes. A study on improved varieties of yam in Côte d'Ivoire demonstrated a high level of acceptability of innovation (Soro et al. 2010). The adoption of new varieties was conditioned by two main criteria: quality culminating aptitude, taste and color of the flesh of the varieties, and their compatibility with the local dishes. In addition, Pérez et al. (2018) showed that in Guatemala, consumers preferred improved iron-fortified bean varieties to local varieties to which consumers were accustomed, although minor differences were found in some of the organoleptic characteristics. This acceptance was explained by repeating the information provided, the order of distribution of varieties, and the type of message provided according to the characteristics of the recipients of the message (Pérez et al. 2018).

In sum, urban food strategies do not target or take into account local specificities. In addressing the food shortage through a diversified offer, there is a need to redefine the social geography of food supply. Findings from this study suggest paying more attention to the extent of urban food strategies developed by authorities, in reconfiguring the relationships between urban and rural areas and between different food system actors. The narratives on urban food strategies show the emergence of a more integrated vision of a local space where urban and rural areas and actors are connected in a web of synergistic relationships (Sonnino 2016). For the case of cassava in Cote d'Ivoire, "connecting devices" of the supply chain such as platforms for food exchanges between rural and urban, southern and central contexts still have weak connectivity. There is then a need to establish a spatial, economic, environmental, and social continuum between different actors, interests, and policies. This connection involves a redefinition of access to land for food crops, especially for women. One should avoid mistakes of the past giving priority to wealthy and male members of the community as well as cash crops over food crops (Moseley et al. 2010). Additionally, an emphasis should be put on the social values attached to the connection of two culturally different geographical spaces. Also, important is the role attributed to re-localization of the production in relation to food security and sustainability concerns. A diversified offer of cassava from the production zones could contribute to food security if strategies contribute to a reconfiguration of the relationships between food system actors, spaces, and governance scales (Morgan and Sonnino 2010; Sonnino 2016)

Food security and the new urban food governance

Urban food supply is increasingly a major policy concern in sub-Saharan Africa. Food shortages and rising food prices are problematic for populations, especially for poor urban households who spend a disproportionate amount of their income on food stuffs. The rise in food prices in 2007 and 2008 revealed that when food is not available and accessible in urban contexts, the situation can quickly escalate into food riots and social unrest (Moseley et al. 2010). Governments are increasingly paying better attention to the governance coordination in the design and implementation of more effective food security strategies. In this process, the role of municipal authorities is often instrumental. During the cassava crisis of 2015-2016 in Côte d'Ivoire, the Abidjan District (municipality) has been at the forefront of the fight, working in finding sustainable strategies

to circumvent the crisis. Additionally, various actors (public/private, formal/informal) are increasingly engaged in strategies for a better urban food supply.

Findings of this study revealed an inadequacy between food security policy and local practices. Urban food strategies are designed with little consideration for the connections and disconnections between different alternative food networks and their combined potential for wider regional development (Sonnino 2016). Support provided to producers in rural areas is mainly to solve a one-time food problem, and not to address a more structural supply problem. According to Perrin (2015) and Djaha et al. (2018), cassava growers acquire cassava cuttings from the National Agency for Rural Development (ANADER) and reproduce the planting material that can then be sold or donated to other producers. The objective of initiating this strategy was to ensure the availability of cassava in all markets in Côte d'Ivoire, but mainly in areas of high demand for fresh cassava such as the Abidjan area. However, this strategy has not been able to stop the cassava crisis for two main reasons. The quality of cassava produced in the center does not match those of the main cassava-based food producers in the Abidjan area. In Abidjan, indigenous women are the main producers of cassava-based food. It is an activity that contributes to the social reproduction in their communities and is structured by local social norms and values. The current producers have acquired this know how through their socialization process. According to them, in order to remain faithful to the quality of the original attiéké, they prefer the traditional varieties that their parents used. For them, the improved varieties are not suitable for the good attiéké. Therefore, the strategy aiming at connecting the southern and central geographical spaces, rural and urban linkages, did not achieve the expected objectives since these two areas are incompatible from the point of view of the cassava varieties produced and used. The ideologies associated with cassava production in these two areas are different. In the central zone, cassava growers produce improved varieties for the economic benefits they offer. In the Abidjan area, urban processors prefer traditional varieties adapted to their local and cultural practices. Without this social categorization of cassava varieties, the production would have met the demand and stopped the shortage.

The factor that could ensure the availability of cassava in the Abidjan area is the high presence of migrants. With an agricultural development strategy that encouraged the recruitment of an external workforce, the plantation economy relies on migrants mainly from Burkina Faso and Mali. Many of those people settled in the lagoon region, in the vicinity of Abidjan where they constituted the main labor force in rubber plantations (Ira 2016; Zah Bi 2015). Nevertheless, with the drop in rubber prices, most migrants have left the rubber farms. The price of a kilogram dropped from 1.52 € to 0.42 € in 2016. Many rubber producers were no longer able to support production costs and could no longer pay workers who were forced to relocate to more attractive regions. However, during their presence in the Abidjan area, they have tremendously contributed in cassava production for the urban population.

Many studies have demonstrated that the association of cash and food crops is possible. N'zué et al. (2013) proved that any plant can be associated with rubber trees and can even promote their growth. According to them, the development of the rubber plantation could lead to an unexpected increase in food production. The presence of migrants in rubber production and its consequence on food production was

corroborated by the study of Coulibaly (2015). His findings revealed that 60% of the rubber producers who account for 88% of the region's total production are migrants. In addition, through their presence in perennial crops, those migrants also participate in the production of food crops such as cassava for the urban market. This means that the collapse of the rubber economy could be a risk factor for the cassava sector (Coulibaly 2015).

The narratives around the "ebb and flow" of migrants in the Abidjan area, uncover an international dimension of the local foodscape. Investment on cassava production is often determined by fluctuation of prices of cash crops at the international market. The cassava shortage coincided with the drop of rubber prices and subsequently the outmigration of migrant workers. As result, many rubber-growing areas have reverted to the production of cassava for household consumption. There were no longer any migrants to produce cassava for sale and the supply of cassava on the Abidjan market has declined. Local populations link the cassava crisis to this relocation of migrant producers and not to the lack of arable land for food crops due to rubber plantations as defended by several studies (Akmel 2016, 2018; Kam 2016; Kouame 2014; Kouassi 2017). The availability of land and manpower is determined by the prices of rubber on the international market (Akmel 2018). However, the findings of this study rather contradict the hypothesis that rubber tree cultivation is the basis of cassava production drop or the scarcity of cassava in coastal regions of Côte d'Ivoire (Kam 2016).

With the aim to ensure food security for all, food policies in African countries have been largely driven by nationally based actors: governments, farmers, processors, and manufacturers. However, cities play a key role in responding to the global challenge of sustainable food security (Sonnino et al. 2014). Debates on the reframing of urban foodscape signal the rapid emergence of urban food policy, driven by new players representing city governments and local civil society organizations. Their aim is to contribute to put in place a more holistic sustainable urban foodscape in which consumption, public health, ecological integrity, and social justice are interconnected (Moragues-Faus and Morgan 2015). This approach of food policy involving urban municipalities with civil society at the grass-root level is yet to harvest expected results in the Ivorian case discussed in this paper. Two main reasons can explain this failure. Firstly, the urban food initiatives are not connected to a national strategy of agricultural production and food security, bringing together various sectors in a holistic way. Secondly, sociocultural issues of food security are not properly addressed. Food crises are not always driven by conjunctural factors such as climate change, increased demand and speculations, or land grabbing for industrial farming. In food security debate, the main focus is mostly on the two ends of the food system, while a range of intermediary actors and activities like processing, distribution, and packaging are overlooked. This could be critically important for creating, consolidating, or constraining the relationships between food producers and consumers (Sonnino 2016). Factors such as social norms, cultural identities, and values people attach to land and food should also be considered. In developing their strategies, policymakers should consider the sociocultural dynamics alongside the complex socio-economic and environmental factors that are shaping the social geography of food supply in African cities.

Conclusion

This study on sociocultural drivers of the "cassava crisis" in Côte d'Ivoire questioned the dynamics of the urban foodscape in sub-Saharan Africa. This includes food environments, institutional arrangements, and cultural spaces. The aim was to discuss the forms of justification and the relational framework as well as the stakes underpinning cassava production in two locations in the country. Inspired by the new geography of food security, this paper proposes to explore beyond the conjunctural rhetoric around unregulated food policies, social unrest, socio-economic difficulties, and environmental stresses to explain food shortage in the African context. Here, it transpired that an emphasis should have been put on socio-cultural drivers. This became apparent through an analysis of "connectivities" between various stages and actors, i.e., food exchange practices and channels between various socio-ecological spaces, and governance coordination in food security strategies.

The cassava crisis in Côte d'Ivoire can be explained by factors such as local ideologies and worldviews around the social distribution of tasks following the gender divide and acceptability of varieties of cassava. Additionally, the rubber crisis on the international market indirectly affected the production of cassava in the Abidjan region. It resulted in the outmigration of workers who constituted the main suppliers of the Abidjan market. Moreover, food shortage can also be attributed to the low "connectivity" between innovative practices and local context and know how. The non-adoption of improved varieties by cassava-based food producers shows that the availability of cassava does not guarantee its use. The shortage of cassava on the urban market is then due to quality and not quantity.

Recent debates have revolved around the question of strategies developed by African governments after the food crises of 2007 and 2008 to move forward. The strategies should be at various levels, from local to regional interactions. Continent-wide initiatives and decisions such as Malabo Declaration[8] in 2014 offer a unique framework to African governments for accelerating agricultural growth and transformation for shared prosperity and improved livelihoods. However, as the Ivorian example shows, initiatives are increasingly coming from below. With the involvement of local governments (urban municipalities) in the design and implementation of urban food policies, it appears clearly that concerted action of authorities and organized citizens at the local level builds more inclusive and locally harmonized sustainability framings necessary for a holistic transformative urban food system. Additionally, a controversial rise of agribusiness companies has been noted in recent years in several countries, constituting a new wave of agricultural investors not only in cash crops but also in food crops. Those new players bring not only many opportunities but also fears on the urban food production.

The coordinating role of local governments could be instrumental in designing and implementing a sustainable food policy if the process is conducted in a more integrative way: connecting places, markets, policies, and peoples. In the era of

[8]The Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods during the African Union Summit of Heads of State and Government in Malabo, Equatorial Guinea in June 26-27, 2014.

decentralization, municipalities will increasingly have an influence in (re-)framing the ways in which food is viewed and valued in the city. However, strategies should be connected to a national strategy of agricultural production and food security involving various sectors in a holistic way. Factors such as social norms, cultural identities, and values people attach to land and food should also be considered. In developing their strategies, policymakers should consider the multifunctional potential of food in relation to public health, community development, environmental integrity, and sustainable land use that are shaping the social geography of food supply in African cities.

Abbreviations

ANADER: National Agency for Rural Development; FAO: Food and Agriculture Organization; FGD: Focus group discussion; KII: Key informant interview; MAXQDA: Qualitative Data Analysis Software; NGO: Non-governmental Organization; OXFAM: Oxford Committee for Famine Relief

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Authors' contributions

Each author made an essential contribution to the elaboration of this article. AJM and GF worked closely and made essential contribution in the design, data analysis, draft writing, and discussion of the paper. SA, KPK, BKK, and NAAA participated in data collection, literature review, and editing of the manuscript. DD and BB reviewed and finalized the manuscript. The authors read and approved the final manuscript.

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The author declares no competing interest.

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