

The use of mobile phones as a panacea to facilitate quick food trade rollout between markets and countrysides: A study of Ayaou-Sran

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ABSTRACT

With an average capacity of 600,000 tonnes, the Bouaké Wholesale Market (BWM) provides opportunities for the countrysides. Unfortunately, the location was a constraint for Ayaou-Sran countrysides. Located more than 90 km from Bouaké, the sub-prefecture seems to have found an answer through the mobile phone. Through the telephone, partners are also in touch with other buyers in the sub-region. They also get in touch with traders in order to talk about time and products' selling conditions. This strategic partnership enables improved communication and decision-making as regard to both peasants and buyers. Thus, farmers manage to sell the bulk of their products very quickly, which products were formerly sold by individual purchasers in the city. The integration of mobile phones today reduces the scope of these individual purchasers and favours the increase of farmers' incomes. This paper summarizes practical experiments in Côte d'Ivoire as part of the testing of e-agriculture with some cooperatives.

Keywords: Mobile phone, distance, communication, e-agriculture.

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INTRODUCTION

Agriculture remains the backbone of the Ivorian economy. It represents 30% of national Gross Domestic Product (GDP), 70% of the export earnings and provides 50% of employment (CNRA, 2008; FIDA, 2009). But agriculture is tormented by marketing difficulties. In fact, as they sometimes happen to be remote or inaccessible, villages encounter difficulties when selling their products each year. As they do not have the right information for the sale, agricultural cooperatives are forced to spend huge amounts to reach the markets after long distance travels. As our society is reported to be an information society (Quéré, 2000), the producers' quest for information requires both financial and colossal resources without forgetting time constraint. But increasingly, some of these producers are using modern means of communication to improve their products sale. The peasants are actually taking advantage of the use of mobile phones, which not only facilitates their access to information, but also reduces their displacements expenses.

Mobile phone is placed at the service of the Ivorian

agriculture in a context where most producers have easy access to it. With this tool, they now have access to information as opined by Quéré (2000), "an objective commodity" which every society needs for its development. For Pasquati (2011), information should be considered as an input for agriculture. This is even more conspicuous that information allows a better control of space (Guillaume, 2000). Mobile phone makes it possible "to lower costs and access to a large number of markets for traders" (Pasquati, 2011). The villages of Ayaou-Sran are a typical illustration of the use of Information and Communication Technology (ICT) to facilitate the revenue generation and sales on their agricultural produce. The site is located in the region of GBEKE including Bouaké (the capital city). These villages have managed to improve the flow of their food crops including corn, with the use of mobile telephony. To analyze the co-ordination between agriculture and the use of mobile telephone in Ayaou-Sran, our research is based on three observations.

Observation 1: The introduction of mobile telephony in agricultural marketing space.

The use of wireless communication systems rapidly spread to the Ivorian countrysides. The peasants have quickly adopted the use of mobile telephony for their commercial transactions. This has increased the number of mobile phone subscribers among the producers and has enhanced quick distribution of their products. Hence the following question: how is mobile phone a facilitator to food sale?

Observation 2: Loss of individual buyers in favour of cooperatives.

Since the cooperative law of 1998, the peasantry was encouraged to get organized. The creation of Ayaou-Sran cooperatives has led this territory in a competition between individual buyers and farmers' organizations. The current report shows an increase of activities of cooperatives in the distribution of corn. From this point, a question emerges: how did the introduction of mobile telephony in the marketing system strengthen the power of cooperatives vis-à-vis individual buyers?

Observation 3: Strengthening farmers' incomes.

One thing emerges from the repositioning of cooperatives in the distribution of food products. Prices increase in a context where cooperatives are witnessing a reduction of marketing expenses through the use of mobile telephone. The following question arises: what opportunities does the mobile phone offer to farmers through the new marketing system adopted by cooperatives?

Based on these observations, the main question that will guide our research is stated as follows: how did mobile telephony contribute to the improvement of agricultural products' sale in this sub-prefecture? In other words: how do producers manage to make mobile phone serve agriculture marketing? How does this new tool allow them to hold the traditional competition with private buyers? What are the impacts of ICT on the Ayaou-Sran's population?

Theoretical framework and assumptions

On a theoretical level, this research was built around the analysis of the sociology of uses in order to understand the phenomena of communication, especially in rural setting. In her article "the development of the sociology of uses hinged on the expansion of ICT", Jouët (2000) highlights the contributions of the sociology of uses in communication. Indeed, the idea being that "the use of tools is not limited to the forms prescribed by the technique" as indicated, one should understand the changes that occur between the prescribed form and

uses. The sociology of uses allows "to question the relationship between technological innovation and changes in society; it also examines how ICT rearticulate relations between private space and public space". It therefore becomes necessary to understand how the rural population has taken hold of mobile phone and its use for agricultural distribution. As a result, the following assumptions were made:

1. The formation of a network of communication between urban and rural populations has facilitated the exchange of information among the different actors involved in the current system of food marketing;
2. The fact that cooperatives use mobile phone help them reduce expenses and make them competitive vis-à-vis their competitors;
3. The cooperatives' capacity reinforcement allows them to buy peasants products at better prices.

MATERIALS AND METHODS

The current system of food marketing by cooperatives involves several categories of stakeholders that were subject to a questionnaire. The two investigated villages are Assamabo and Ayaou-Sokpa. The cooperatives at stake are respectively Toutia and Coopéka. In each of the cooperatives, 30 corn producers were surveyed by a questionnaire. As for cooperative leaders (President, Chief Executive Officer) and collectors, they were subject to interviews. This was done even at Bouaké, with the president of the wholesale merchants, 10 traders and 4 carriers involved in the transportation of the products in the two cooperatives. Finally, the testimony of two students who transferred information via Short Message Service (SMS) to farmers was a significant contribution. The data collected from Bouaké Wholesale Market (BWM) during the months of December, January and February were necessary for the writing of this paper. Our collected data was supplemented by those of the Non-governmental Organization (NGO) called Chigata which provides with emails as well as the weekly corn prices at the national level.

RESULTS

The wireless phone, a new communication tool has allowed rural populations to establish a close link between the sub-prefecture of Ayaou Sran (the area of production) and Bouaké Wholesale Market (the big area of products marketing). Wireless phone, which is very used, has introduced changes in the behavior of farmers particularly in trade commodity. The change is all the more remarkable that we have moved from the informal system, dominated by the proliferation of private buyers to the current system marked by a new marketing organization. This organization is marked by the presence of local cooperatives that now enjoy the benefits of modern telephony.

Phone communication strategies are marked by messaging (SMS) and calls for lower costs (fleet that enables networks of people to communicate for free, after paying a monthly fee). We also witness the entrance of

new actors settled in the city of Bouaké. Interacting with rural people, the latter ones take part in the distribution of products.

Establishment of communication networks

We are in the context of the spread of the use of mobile phones in our country. The cost of the phone is relatively low so that everyone can afford it. It facilitates communication and the flow of information on the distribution of food products. Farmers have adopted this new tool that helps in the corn trade from a communication network made of urban and rural actors.

Functioning of the exchanges network between the countryside and the BWM

The communication network provides better information dissemination. The information is conveyed by two students working in collaboration with Assamabo's people. The students' work entails in collecting information about food prices in BWM. The information is communicated to producers through the text messages they receive daily. This allows them to take the best decisions for the sale of their products. In the functioning, the peasants of secondary education level have been identified and they respond to messages indicating the prices offered by different categories of buyers at the village level. These exchanges are all the more facilitated by the fact that peasants just have to make a 2,500 FCAF¹ monthly consumption to benefit from more than 5,000 possibilities to send messages. One should also subscribe 100 FCAF to get at least 500 text messages for the day for interlocutors of the same mobile operator. As these exchanges reveal cheaper, they are all taking hold of this communication technique that is written. This distribution of information is reinforced by another opportunity offered to the actors. This is what is commonly called "communication fleet." In this communication system based on network, each individual at stake is compelled to have a monthly consumption of 3,000 FCAF. Once the condition of 3,000 FCAF monthly consumption is met for each member, they can call toll, from 00 am to 06 pm, every day of the month. The purpose of registration in such a project of communication is to offer members a wide possibility of dissemination of information. In addition, the actors can broadcast messages from 400 to 1,000 people per day. This avoids the possibility of withholding information that the lack of financial means could induce. Thus, purchasers of "network fleet" are given an opportunity to describe in detail the business environment both in the countryside and in the city. This allowed cooperative officials to directly discuss with traders from the

wholesale market. One could say that the marketing team ended up making information technology its allies. A similar approach is found in the partnership between the wholesalers and the sub-regional traders.

Exchange of information between Bouaké wholesalers and sub-regional retailers

Another line of communication with the wireless phone was created between BWM traders and other West African traders. Indeed, the BWM radiation extends to all the countries of the sub region. For BWM traders, sub-regional markets remain more beneficial for the exercise of their activity. These markets also influence the price of products at a local level. To better manage the distribution of products, BWM merchants fetch information on other markets (Figure 1).

Several capital cities of the sub-region are supplied with corn by the BWM. The decisions are taken through partnerships forged with other traders. The process is practically the same as that described above. Communication is made by phone calls. Unlike SMS, calls are more expensive. But traders prefer calls for the time being; according to them, calls can help build trust among them. In addition, according to them, text messages hinder understanding because they do not provide all the details. "No honest negotiation can be done remotely, without appeal," announced one of the presidents of the wholesale merchants. May the communication be established by a Short Message Service (SMS) or a call, today, mobile phone contributes to the improvement of food products sale. In all cases, it mobilizes a little less time and resources than traditional forms of communication. The distribution is made possible using trucks which serve the cities of Côte d'Ivoire and of the inner-area (Figure 2).

At Bouaké Wholesale Market, the corn is dried again and conditioned before being sold on the other markets. But, the task of the tradesmen and the producers is rendered easy by the activities of one NGO.

Support of the NGO Chigata

In its functioning, the NGO regularly collect data on changes in corn prices nationwide. The city Communication Team receives the stock of the NGO each week-end (Table 1).

This table is followed by the comments of the NGO. These reports are relayed to rural people by Bouaké's team. This helps farmers to better track corn prices and to take the best marketing decisions.

Contributions of mobile phone in food distribution system

Before the advent of mobile telephony, cooperative

¹1 Euro amounts to 655 FCAF

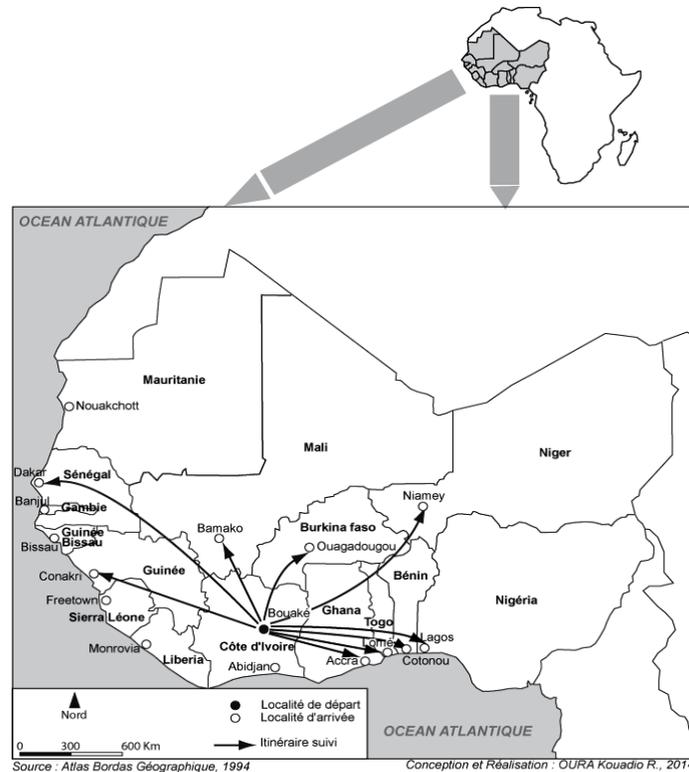


Figure 1. Ivoirians' partners countries.



Figure 2. Loading a truck of corn at Bouaké Wholesale Market. Source: Our survey (2015).

leaders were forced to move to the city in search of information and markets. Mobile telephony has changed the cooperatives' sale system as regard to their products.

Reduction of transportation expenses

Formerly, the producers were compelled to move in order to get information and to find markets. These

displacements require huge financial resources. "Sometimes we could travel without the required information being obtained. Who shall we get in touch with? Where can we find the most advantageous market? And we went into town without finding answers. It was then unnecessary expenses. Today, the phone is helping us all." This testimony of the President of Toutia exemplifies the cooperatives' difficulties of functioning before the advent of mobile phones. The transportation

Table 1. News of agricultural prices-Newsletter of maize market in Ivory Coast.

Areas of consumption	Farm-gate prices	Wholesale prices	Detail prices
Denguélé	85 - 90	120 - 125	150
Lakes	88 - 100	100 - 108	200 - 300
Savannahs	75 - 80	87.5 - 90	100 - 115
Woroba	75 - 80	85 - 95	100
Valley of Bandama	75 - 90	100 - 110	150
Zanzan	90 - 100	120 - 150	150 - 170
Sassandra-Marahoué	85 - 90	110 - 115	200 - 225
Low Sassandra	-	125 - 150	200 - 250
Lagoons	-	120 - 140	200 - 250

Source: OCPV, January 29, 2014. www.ocpv.info.

fee from the sub-prefecture to Bouaké is estimated at 7,000 FCAF for the round trip. To the transportation fees, we must sometimes add catering fees and in some cases, accommodation fees.

Transactions by transfer of money: an answer to the insecurity

The telephone enables to settle one's debts and to solve the problem of the insecurity in the trade of the products as opined by the manager of Coopéka:

"Beforehand, one travelled with fear because one could be robbed of his money on the way. Today, all the transactions are performed by transfer of money. One does not travel any more with the money in the pocket. I think that it is one of the main advantages of technology. You put the money in your account or in that of your partner and you travel quietly".

All these fees are a loss for cooperatives that now avoid a number of movements. Thanks to mobile phones.

Attractive prices and farmers' incomes increase

Mobile telephony reduces cooperatives' expenses. This maximizes their profit. As the members of the cooperatives mean to better enjoy the fruits of their labour, the consequences of the use of mobile phones are noticeable at various levels.

Comparative analysis of prices offered by cooperatives and individual buyers

Individual buyers have long had the monopoly of the purchase of food production in the sub-prefecture. However, they used to impose prices that were less beneficial for producers. In this case, they vary prices at

their own pace. But during these recent years, price changes in the context of the open competition between individual buyers and the cooperatives are quite revealing (Figure 3).

In the two investigated villages, the price has considerably changed since the cooperatives have been created. In the village of Ayaou-Sopka where cocoa is abundantly produced, Coopéka does not consider corn as its product of sale. Thus, the trend of the prices of corn is mainly influenced by toutia's activities. At the beginning (before the cooperative was set up), the price was very low. Toutia was created in 1999 when the price of corn had never exceeded 80 FCAF. And after its creation, the price has quickly increased. Thus, even in the absence² of the cooperative, after the war, the old prices of corn were maintained as an achievement of the cooperative's first activities. The resumption of its activities in 2013 and 2014 increased the prices again. In this competition, the individual buyers spend weeks without buying corn when corn products are diverted to cooperatives that offer better prices to farmers. However, breaks at the cooperative level can be explained by the lack of funds for the purchase. Normally, this would not have been a problem since the cooperative is a products collection business and is not a purchasing business. However, suffice it that cooperatives are out of funds that farmers are turning to private buyers, even when they propose cheaper prices. That is the reason why some unions are now setting themselves as purchasing companies. They also offer relatively high and stable prices.

Prospects for increasing farmers' income

Considering the period the cooperatives are functioning and using mobile telephony for their commercial interactions, it would be pretentious to say that this tool allows an improvement in farmers' incomes. Nevertheless, our results provided evidence of the

² Because of the war of the year 2002, Toutia stopped its activities for a very long time.

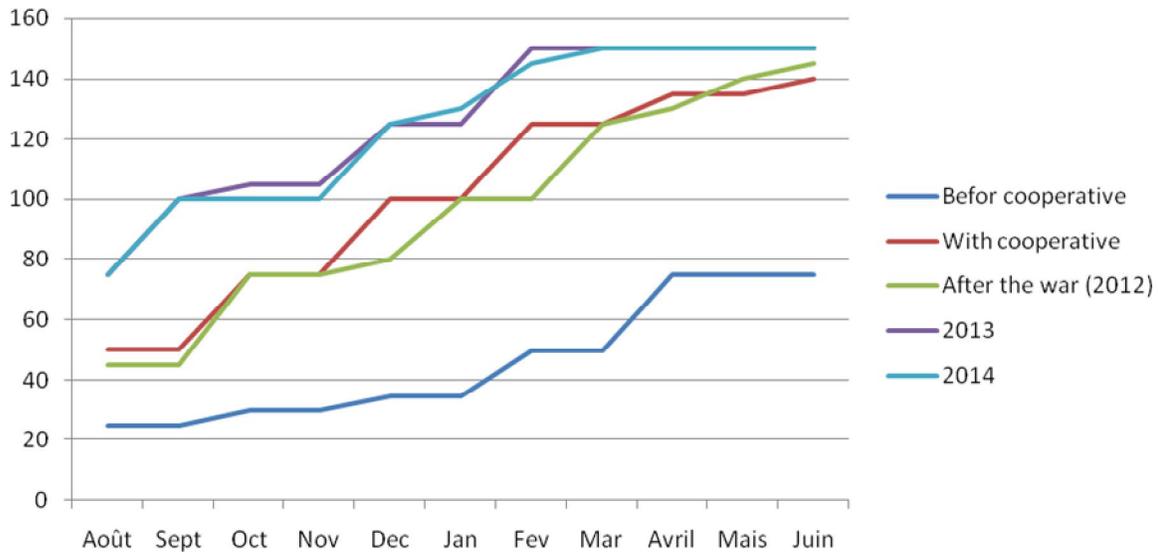


Figure 3. Annual trend of the prices of corn in the countryside. Source: Our survey (2015).

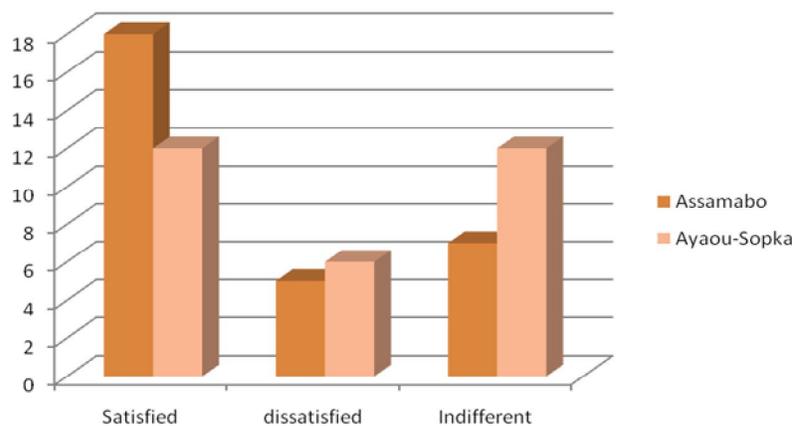


Figure 4. Distribution of the peasants according to the level of satisfaction. Source: Our survey (2015).

ongoing changes. Had it not been the involvement of cooperatives in the current process of products marketing, farm-gate prices would not have experienced such an increase. Through cooperatives that have kept the price per kilogram of corn at 100 FCAF, farmers have seen their earnings increase this season. In this respect, it is quite sure that this will enable farmers to generate more revenue during the coming years.

Satisfaction survey in the villages of Assamabo and Ayaou-Sopka regarding the cooperatives

After having conducted a satisfaction survey within the two investigated villages concerning the cooperatives, it stood out that the influence of the cooperatives on the peasantry's life is differently viewed. In fact, while the

peasants of Assamabo are mainly satisfied with the presence of Toutia in the system of marketing of corn, the respondents of Ayaou-Sopka are lukewarm (Figure 4).

In the village of Assamabo, 60 per cent of the surveyed people are satisfied with the activities of the cooperative and feel that Toutia helps improve the conditions of sale of their products, namely corn. A peasant conveys his satisfaction using as follows: "we never saw similar price of corn here. This happens thanks to the newly created cooperative. The cooperative can't rob us. However, Dioula³ people's intention is to rob us". This opinion is not shared by 16.67% of the guarantors. According to the latter ones, the members of the cooperative work for their own interest, and not for the sake of the village. They also claim that the cooperative can jeopardize the future

³ Trader community

of the village as it does not possess enough means. The cooperative does not have enough money to undertake its activities. "During the months that the cooperative can't buy the product, Dioula buyers refuse to come to our premises. And under such conditions how can we sell our products during this time?", asked one of them. As for the 23.33% others, they are indifferent to both Dioula people and the cooperative. For the latter ones, the introduction of the cooperative into the system of marketing cannot account for price increase. According to them, rise in prices is rather due to the strong demand on the markets.

The rate of indifference is higher among the populations of Ayaou-Sopka (40%). For the manager of Coopéka, the fact that their cooperative invests less in the purchase of corn -as opposed to Toutia- is the major reason underlying this high rate of indifference.

DISCUSSION

This study revealed rural population's access to information through mobile telephony. The countryside's access to mobile telephony was confirmed by many other authors (Sanga et al., 2013; Mahrukh, 2012; Baye et al., 2005). In fact, for Hosseini and Niknami (2009) "Information and Communications Technologies (ICT) have the potential to improve the living conditions of rural population". This helped them have an overall knowledge on the corn market as Quéré (2000) opined: "To inform somebody is to make him aware of something, to let him know an event, a situation or a given state of affairs." As for Aker (2011), he opined that "the rapid spread of Information and Communication Technologies (ICT) in developing countries offers a unique opportunity to transfer knowledge via private and public information systems". In sub-Saharan Africa, 60 percent of the population were reported to have a mobile phone in 2008 (Aker and Mbiti, 2010). With this new communication tool whose use is facilitated by its lower cost, the peasants sell their products under better conditions. "Mobile phones significantly reduce the rural poor's communication and information costs" as opined by Aker (2011). Like in Ayaou-Sran, the use of Short Message Service (SMS) is also exposed by the author. Indeed, the distance is overcome with new means of communication (Guillaume, 2000; Hosseini and Niknami, 2009). Those who make good use of ICT's profit from them (Massit-Folléa, 2002).

Aker (2010) analyzed the impact of mobile phones on agricultural price scattering in Niger. The author came to the conclusion that "the introduction of mobile phone service between 2001 and 2006 accounts for about 10 to 16 percent of the reduction of grain prices catering".

With the advantage of reducing communication costs especially in transportation, cooperatives are now able to offer competitive prices. Without their involvement in the marketing system, the farm gate price would have even

been lower in 2013 and 2014. At the same time, the price would have been 70 FCAF per kilogram. Being currently 100 FCAF, this is a shortfall of 30 FCAF which characterizes the current competitiveness of cooperatives through the mobile phone. This is what led Pasquati (2011) to state that "the potential of ICTs for rural development in developing countries becomes obvious if we observe on one hand, the importance of information for the development of agriculture and, on the other hand, the shortage of resources and infrastructure that characterizes the majority of farms in our country". These are probably the reasons why the State of Côte d'Ivoire intends to "reduce the cost of telecommunications to help a greater number of people to have access to services" (IMF, 2012).

Conclusion

The high cost of land transport and the inadequacy of road infrastructures have long been a hindrance to agricultural development, especially in food production. Foods reach large areas of consumption that are urban markets with difficulty. Between production areas and these markets, foods are rotting without farmers taking advantage of their products. The use of mobile phones has modified the product distribution patterns. This was possible thanks to the use of this communication tool by producers who were able to develop a partnership with city dwellers who regularly provide them information. The benefits of such an organization of the agricultural system from ICT are real: the power of cooperatives vis-à-vis private buyers contributes to raising farmers' incomes from the best price offered by the cooperatives. In this case, mobile phone is actually being displayed as an undeniable input of agriculture in our area of study. Taking account all these reasons, the development of ICT is a major stake for the Ivorian State. ICT are one of the major pillars of the economic emergence desired by Côte d'Ivoire (IMF, 2012).

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