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Review

Linking small-scale farmers to markets in Benin: a failure of ICT-based initiatives? Evidence from case studies

Anselme Bienvenu Adegbidi

Department of Economics, Socio-Anthropology and Communication, Faculty of Agricultural Sciences, University of Abomey-Calavi
E-mail:ansadegbidi@yahoo.fr

Abstract

This paper addressed how the organizations that promote the use of ICTs by farmers and traders in Benin approached the issue of linking smallholder farmers to markets and if they succeeded in their interventions. The main result was that farmers were not the main targets of the ICT-based market initiatives, nor were they intended to be the direct beneficiaries of the projects. Hence, the ICT impact on improving market linkages could be questionable. Nonetheless, there was hope that farmers would benefit through greater market transparency and greater access to highly rewarding value chains for traders.

Keywords: Benin, ICT, market access, market information services, farmers.

INTRODUCTION

Market access is one of the most important factors influencing the performance of smallholder agriculture in developing countries, and in particular the least developed countries. Access to new and more rewarding markets for agricultural products is vital in enhancing and diversifying the livelihoods of poor subsistence or semi-subsistence farmers. Such markets can be local (including village markets), catering for the local populations, regional markets serving regional consumers in counties/districts/provinces within one country or between countries, and international/export markets in both developed and developing countries.

Smallholder producers form the majority of both the total and rural poor in many developing countries, especially Africa. Most smallholder farmers are engaged in subsistence and semi-subsistence agriculture with low productivity, low marketable surplus (hence returns) and low investment, a situation described as low equilibrium poverty trap (Barrett and Swallow, 2006; Barrett, 2008). Enhancing returns from agricultural production through improved access to markets can therefore be a vital element of poverty alleviation strategy and livelihood improvement. Improved market access results in commercialization of agriculture, which has short, medium, and long-term benefits to farmers. In the short term, market access can result in the production of marketable surplus and hence gains in income from agriculture. In the medium to long run, the surplus from improved market access can result in higher revenues, savings and hence investment in productivity enhancing technologies. The effect of market access for smallholder farmers is even greater for high-value commodities (i.e., non-traditional, non-staple crops such as high-value fruits and vegetables and organic products). There is evidence that access to such markets have benefits to smallholder producers (Okello and Swinton, 2007). Such benefits include direct income for smallholder producers and the indirect impacts at both the household and community levels in terms of employment. And, it is recognized that information and communication technologies can drive market access to reach those benefits.

Information and Communication Technology (ICT) is a generic term used to express the convergence of technologies and information services in telecommunications, information management, broadcasting; and the use of such technologies in the delivery of social and economic products and services at all levels of society Tamukong (2007). In other words, it is ICT for Development (ICT4D) – where technology is integrated in the national development and poverty

reduction agenda. This justifies applying ICTs in agriculture as an economic sector.

In Benin, ICT-based market interventions were undertaken by various external organizations in support of a few farmers and traders organizations in rural and urban areas, with the aim of improving farmers' access to markets of agricultural produce through reliable and up-to-date market information, namely for major food crops and new cash crops. The latter emerged out of the government's policy of diversification of agriculture for improved food security and poverty reduction. Among the organizations that took ICT initiatives, MISTOWA (Market Information Systems and Traders' Organizations in West Africa) played the most prominent role. The MISTOWA project aims to increase regional agricultural trade and food security by improving and linking the existing regional efforts to generate, disseminate, and make commercial use of market information. Effective Market Information Services (MIS) and traders' organizations (TO) will also heighten farmer awareness of opportunities and technologies to increase production, and will facilitate the demand drive for higher value and quality agricultural products. This project was submitted to USAID by the Center for Soil Fertility and Agricultural Development (IFDC) in 2004. To improve the access to agricultural business information in West Africa, the MISTOWA project supports on the one hand the existing public Market Information Systems, in particular through their regional network (RESIMAO: "Réseau des Systèmes d'Information sur les Marchés de l'Afrique de l'Ouest"). In Benin, ONASA ("Office National pour la Sécurité Alimentaire") is the focal point of RESIMAO. In addition, MISTOWA encourages the installation of Agribusiness Information Points (ABIP and PICA in French language).

How do these organizations that promote the use of ICTs by farmers and traders in Benin approach the issue of linking smallholder farmers to markets? Do they succeed? That is what is investigated in this paper. The rest of the article is structured as follows. In section two, the theory behind the role of agricultural information in reducing market failure is contextualized in Africa. Thereafter, the context of farming constraints to markets and market policies in Benin is presented. In section three, the methodology of the paper is summarized. In section four, the cases of ICT-based market initiatives are described according to their objectives, their conduct, the contextual problems they faced and the outcomes obtained. Success (or failure) of an intervention is assessed in terms of: sustainability of the program (long lasting), its appropriation by farmers, increased diversification of production, improved market access and efficiency, and number of farmers reached. These are assimilated to program outcomes. In section five, a synthesis of the cases is exposed along with a comparison on the basis of the salient elements (target groups, approaches/methodologies and main outcomes). In section six, the paper ends with the lessons learned from the cases and some policy implications.

Literature review and background

Role of agricultural information in resolving market failure

The literature suggests that smallholder farmers' access to markets is constrained by, among others, i) lack or asymmetry of information, ii) lack of access to productive technologies: While lack of access to productive technologies can constrain commercialization, we focus here only on poor technology access due to lack of information, iii) poor access to public and private goods (Barrett, 2008). Lack of information on the quantity and quality of produce traded, commodity and input prices, and credit sources results in opportunistic behavior by traders, input dealers and moneylenders. In the absence of information, smallholder producers face problems of information asymmetry (such as moral hazard) that limit the performance of agricultural commodity and input markets, and in turn the participation of small producers in these markets. Studies in Africa indicate that under such circumstances, input and output markets are thin thus small quantities are traded and exchange is based on visual inspection (Fafchamps and Hill, 2005; Fafchamps and Gabre-Madhin, 2006). The high transaction costs of such exchange process impede access to better-paying markets and entrench poverty (Barrett, 2008). In addition, poor investment in public and private goods especially roads and telecommunication further increase the transaction costs and risks (Poulton et al., 2006). As a result smallholder farmers, especially those in remote areas, are poorly connected to efficient and competitive marketing channels. Therefore smallholder farmers, when and if they participate in markets, are often obliged to accept low prices for their produce (Shiferaw et al., 2007). Furthermore, processors and traders are constrained by low quality undifferentiated products, high cleaning costs and inadequate and unreliable supplies whereas market intermediaries in the supply chain face high assembly costs, high market risks and cash flow problems (Shiferaw et al., 2008). Lack of market information therefore reduces smallholder farmers' ability to produce high value differentiated products with desirable market traits in addition to their inability to penetrate high value niche markets. It exacerbates the problem of low-level equilibrium poverty trap that locks smallholder producers into subsistence production and imperfect markets where they typically trade in low volumes. Trading small quantities of produce denies smallholder producers an opportunity to exploit economies of scale and the bargaining power to negotiate prices, thereby reducing their ability to compete with well-established producers.

Lack of information is compounded by the incentive structure facing the farmers and their capacity to gainfully use market information. Farmers may thus be unwilling to diversify out of “low value” staples into higher value crops if staples markets are too high cost or high risk to rely on for food purchase (Fafchamps 1992, Jayne 1994). Additionally, limited productive assets (land, animals, credit for inputs) may reduce marketable surplus and hence farmers’ ability to participate in the market, even if they know that opportunities to do so are available. The small and irregular surpluses also discourage the development of efficient private markets implying that the causality between market access and supply capability could be two-way.

Availability of agricultural information and effective use in imperfect markets can be considered as a merit good. It will make market segments more contestable and it will make farmers more eager to develop commercial activities if the information is adapted to their needs. The existence, and timely use of reliable information on prices, quality, supply and market demand conditions contribute to ensuring a better market environment and to balance the capacities of the various actors.

Each market transaction is to some extent unique because each party faced barriers of time and distance between alternative exchange parties. Each party comes to the exchange with different knowledge about the characteristics of the underlying market forces for the item to be exchanged. Arrow (1982) argues that the party with relatively greater knowledge actually sets the initial price. The other party then decides whether to accept or reject the offered price. If little competition exists, there will be little pressure to set the posted price close to the actual costs of offering the product in that time, place and form. Heavy competition, however, improves the other party’s knowledge of market conditions, and it forces an adjustment in posted price by either direct negotiation or the patronizing of alternative dealers. In such a framework of price formation, market knowledge is market power. One of the most important steps governments can take to improve the fairness of market price formation, so that it discriminates less against the small farmer at one end and the consumer at the other, is to provide these individuals with timely and accurate information about actual market conditions. In this respect, it is interesting to stress that an aspect of contestability must be the insignificance of ‘shifting costs’ (Siamwalla, 1978). This author defines these as the costs a farmer would bear by shifting his dealings to an alternative trader (financial ties or other inter-linkages that may be interpreted as ‘exit’ barriers). He considers them one of the major factors determining a market structure.

Agriculture and market policies in Benin

The Republic of Benin belongs to sub-Saharan Africa, and its economy is essentially based on agriculture. The agricultural sector employs almost 70% of the work force in Benin, and contributes 80% to the country’s export earnings and 15% to the public revenue (MAEP, 2007). Agriculture is an important source of income and food security for rural households. Farmers in Benin are generally smallholders. The agricultural sector is dwelled by approximately 450,000 agricultural producers, and is characterized by small-scale farming where average cultivated areas range from 0.50 ha in the southern part of the country and 2 ha in the north. Actually, the structure of agricultural land holding is largely skewed and land concentration can be observed: 34% of farm households have less than 1 ha; and only 5% of farm households in the South and 20% in the Northern part of the country have more than 5 ha. They are geographically dispersed but they contribute the bulk of total agricultural production. They produce most of food and cash crops. Most of them produce small marketable surpluses. They sell and purchase commodities (inputs and outputs) in rural markets that are typically thin and characterized by fragmented supply chains with many intermediaries. Presently, food security can't be achieved in Benin without smallholders. Farmers' organizations (FO) are also increasingly gaining voice about their members’ needs in various fora on policy-making and service provision orientation. They are solicited by the private sector to enhance chain development, including for new markets, and they play a role in local development planning. Farmers' organizations are more than ever, actively involved in agricultural development, which requires institutional, organizational and technological innovation in order to be successful. But, farmers are passively involved in commercial activities in the marketing channels. Indeed, farmers’ organizations are not active in the food market and, therefore, only a minority of large-scale farmers is able to develop more profitable commercial strategies (Lutz, 1994).

The constraints to market participation of smallholder farmers are numerous in Benin. Farmers often lack information on demand and supply, prices, and quality of agricultural inputs and outputs. The lack of market information encourages opportunistic behavior among traders. Therefore, most smallholders face low prices for their produce and high prices for inputs. Weakness of farmers’ organizations coupled with lack of information on supply and demand conditions cause farmers to sell their produce at farm gate or local markets that offer low prices. The low output prices and the high input prices dampen incentives to commercialize production. There also are weak or inadequate rural transport infrastructure and non-competitive/high cost transport services, weak or inadequate storage infrastructure and weak or limited availability of technical advisory services. In addition, there are crucial lack of access to competitive financial services and lack of standard units and techniques of measurement. Besides, traders’ organizations (TO) set

some compulsory trading rules in local markets which act at the expense of farmers. The above problems inflate the costs of market transaction and inhibit smallholder participation in higher value supply chains. Agricultural productivity remains low, farmers are very poor and agriculture remains underdeveloped. The rural poverty index rose from 25.2% in 1990 to 33% in 2000 in Benin (Adegbidi & al., 2000).

In the agricultural sector, reforms were implemented in food marketing, cotton marketing, input distribution, rural finance, and agricultural services. These reforms were defined in the 1991's document entitled "Lettre de Déclaration de Politique de Développement Rural (LPDR)". This policy document was revised in 1999 and became "Déclaration de Politique de Développement Rural" or Declaration of Rural Development Policy adopted in June 2000. This revision of the LPDR was accompanied by a strategy document, the "Schéma Directeur du Secteur de Développement Agricole et Rural", which was prepared in April 2000. But, the Operational Strategic Plan which translated the overall strategy into action plan was done in August 2000. The reforms in the food market involved the official liberalization of marketing activities, the restructuring of the cereal marketing board (Office National d'Appui à la Sécurité Alimentaire, ONASA – former Office National des Céréales, ONC), and the establishment of a market information system (Badiane, 2000). This policy was expected to make the market more transparent, to strengthen competition, and to improve market integration. The "Centres d'Action Régionale pour le Développement Rural" (CARDERs) were also relieved of all commercial activities. These organizations were restructured recently as "Centres Régionaux pour la Promotion Agricole" (CeRPA), in order to promote agricultural production in the communes of Benin by providing extension services to farmers and fostering private market-oriented farming, although food security still remain a national sovereignty issue.

Setting up a market information system in West Africa is a regional initiative of the RESIMAO (Réseau des Systèmes d'Information sur les Marchés), a network that covers that sub-region. It aims to improve access to sound information in agricultural trade in West Africa. MISTOWA supports existing market information systems in West Africa. In Benin, MISTOWA's support is firstly directed to ONASA, the national representative of RESIMAO. ONASA is the semi-public office in charge of solving the problem of smallholders' poor access to information, with the focus on promoting information transfer through a public market information system comprising Radio and billboards in the spot markets. As mentioned earlier, MISTOWA also encourages the establishment of "Agribusiness Information Points (ABIP/PICA) at the workstations of groups of economic operators that are partners of the project: merchants groups and associations (MA/OC), farmers groups and associations (FA/OP), inter-professional and other marketing support organizations (Chamber of Agriculture and Chamber of Commerce, information centers). Here, the project's beneficiaries are suppliers, transporters and users of adequate information for decision making on commercial transactions. They are at the local, national or regional levels in a specific agricultural sub-sector or not. The Platform for Agricultural Trade in West Africa (www.tradenet.biz / www.wa-agritrade.biz) compiles most of this information on the Internet.

METHODOLOGY

Case studies are common research strategies in social sciences, but very delicate. The choice of a case study approach is justified for our research because according to Yin (2003), case studies represent the appropriate research strategy for "how" and "why" questions about contemporary real-life phenomenon for which the researcher cannot manipulate the relevant behaviors. In addition, he points out that case studies suffer from generalization to populations or universes like experiments, but they are expandable to theoretical propositions.

The description of cases made in this article encompasses the results of the documentation of ICT-based market interventions in Benin from secondary sources/reports, discussions with program leaders and focus group discussions with farmers in the field (market interventions areas). It is done on a case-by-case basis, highlighting the main features of the conduct, contextual problems faced, and outcomes of the interventions. As indicated earlier, outcomes (successes or failures) will be assessed in terms of: sustainability of the program (long lasting), its appropriation by farmers, increase/diversification of production, improved market access and efficiency, and number of farmers reached.

The general objective of all the interventions studied is to improve traders and/or farmers' access to markets via ICT-based market information systems. Most of these interventions are hosted by a regional/country-level organizations and/or sub-regional/local organizations at district/communal level. Depending on the existence/non-existence of a previous market information system and the scope of the intervention (area coverage), the approach used by the external ICT-based MIS promoting organization would differ in terms of origin, hosting, conduct, information dissemination and follow-up mechanisms. Prior to these factors, interventions would also differ according to their target groups.

Therefore, in order to facilitate the comparison exercise, the interventions will be classified simply according to the following three main criteria: geographical coverage (local/national/regional/international), MIS type

(new/upgraded), types of participants (public/private/smallholders). In relation to the descriptions of various cases, the comparison will focus mostly on the methodology/approach of intervention, the outcomes and lessons learned.

Overview of the cases

The PICA initiative in the Central Region (Zou-Collines) through the IFDC/MISTOWA Project

This intervention was financed by the MISTOWA (Market Information Systems for Traders' Organizations in West Africa) project of IFDC (International Center for Soil Fertility and Agricultural Development). It consists of market information distribution to traders and producers through agricultural trade information points (PICAs) based in selected sub-regions of the country. In Benin, there was one PICA in Glazoué for the central region (Zou-Collines departments), another in Savè (Zou-Collines) for cashew nuts producers, one in Banikoara and Gogounou for the northern region and one in Malanville for the upper north. The case study reported here is the MISTOWA/PICA of the central region (Dassa-Glazoué) where we conducted focus group discussions to elicit information in preparation of the household survey.

Objectives and target groups/beneficiaries

The objectives of the MISTOWA/PICA were: (i) to create a network for developing produce markets and enable profit making by the actors in the market chains; (ii) to position the country in the sub-regional market of agricultural products. The intervention was targeted mainly to traders and farmers via their organizations. In the Zou-Collines region, there are farmers' organizations mainly for cotton, maize, rice; cashew nuts and vegetables but the direct beneficiaries of the MISTOWA project in that region were rice and cashew farmers. Other beneficiaries include the city council (and related local government services) through taxes collected on agricultural products.

APPROACH/METHODOLOGY

A PICA is a regional market information dissemination center managed here by the leaders of rice farmers' organizations. The market information includes past and current prices, quantities available, periods of marketing (procurement /purchase and sale), etc.

The means/tools used to disseminate this information include:

(a) A computer, located at the headquarters of the regional rice farmers' association, for storing and disseminating market information to project members through e-mails and mostly via a specific website (www.tradenet.biz).

(b) Direct Sms (mobile-to-mobile) and/or interactive SMS (computer-to-mobile phone) of prices collected on local markets.

(c) Billboards on the spot markets.

(d) Mobile phone calls.

The website is updated at the IFDC country office in Cotonou where West African and international market information is processed and sent to the PICAs. At the regional level a technical team assists farmers' leaders in the management of the PICA by also collecting, processing, storing and disseminating local market information, namely a market price list that is also posted on billboards in the marketplaces for use by traders and farmers. This work was supposed to be on a regular basis (market days). These raw local and regional market data are then sent to Cotonou for further processing and dispatching to the PICAs via the website. The process/system is designed to be interactive and continuous.

The zone of intervention dealt about here is the Central region of Benin. Its economy relies on a smallholder and food crop-dominated agriculture where about 300,000 ha – of which 2/3 for food crops – are cultivated each year by about 117,500 farm households. Average maize and cotton yields are about 950 kg/ha. In the past, the region registered the interventions of many donor-funded agricultural projects that enhanced farmers' capacities for the use of improved farm technologies.

The agricultural products that were concerned by the PICA include rice (local and imported), cashew nuts, yams, soya beans, and fertilizers. The scope of the intervention was both local (price billboards) in local markets of the Zou-Collines, and regional (internet/email) including Cotonou, Burkina Faso, Togo, etc. Through their leaders, training was provided to project members on the use of computer and internet, as well as the use of mobile phones for sending Sms.

Contextual problems of implementation and solutions used

Problems faced pertained to the general setting of agricultural trade in Benin and technical constraints related to the PICA itself.

Regarding the general setting of agricultural trade, local production of rice had to face the massive importation of rice and rice food aid. Rice commercialization was also hampered by the Government who practiced pan-territorial or pan-regional prices without any possibility of price negotiations by the farmers, whereas prices were subjected to fluctuations in the open/free market. The initial gains farmers obtained from market access through increased access to market

information were wiped out by irrelevant ad hoc government policies. Finally the market information could not be used by farmers and traders to inform timely marketing decisions, and many of them faced losses. On

another hand, some traders resisted to PICA intervention simply because they could not apply arbitrary prices anymore. However, they did not influence the intervention that much.

Regarding the PICA intervention itself, its success was constrained by poor technical and financial management. There was a leadership crisis among local branches of the rice farmers' organization that led to an inadequate installation of the PICA computer and a permanent disruption in the internet/e-mail service provision just a couple of weeks after the installation. As a result, market information dissemination via that medium was delayed and the same price information could not be delivered to different localities.

Outcomes

The IFDC/MISTOWA project lasted about 3 years in the Central region but its financing covered only 2 years. However, farmers showed an obvious interest to the PICA as it allowed them more availability of, and greater access to market information. As members of the project, beneficiaries had free access to market information.

Sustainability: The regional rice farmers' organization (UNIRIZ-C) that hosted the PICA has some sub-regional branches (UCR: "Union Communale de Riziculteurs"). Today, the project activities continue only at the local level (i.e. UCR level). Market information dissemination via internet has stopped and region-wide Sms services are drastically reduced due to resource limitation. Some farmers think sustainability will be gained through collection by their local organization (UNIRIZ-C) of payment from beneficiaries for the services they receive. Others believed that the transmission of market information from the regional to the local level was uniform in all localities and that the effectiveness of the PICA depends on the level of appropriation at the local level in terms of prompt dissemination to members.

Meanwhile, the management of the organization's resources and decision-making are kept at the regional level while awaiting the capacity building of UCRs before those responsibilities would be transferred to them. Actually, there is still a debate on whether or not to operate this transfer.

Other members were rather radical, as they believed the project did not achieve anything: attendance to the PICA (local computer) was minimal and people in charge of operating it were not adequately trained. As a result, the PICA did not function well.

It appears obvious that the PICA is mainly concerned by new crops as cashew nuts and rice. Cotton which was the main cash crop in the area is now less cultivated and it was estimated that the acreage is reduced by 40% (rapport annuel CeCPA Zou/Collines). The low price of cotton and mismanagement in the cotton sector induced the shift of these new crops.

PICA as we have mentioned it is implemented with the participation of farmers' organization confronted with market access problems. The initiative has not been successful so it is not surprising to notice that farmers keep complaining about the outlets of their produce, mainly rice for more than 3,000 tons of rice.

IFDC/MISTOWA support to cashew producers in the central region (PICA URPAZ-C) Collines department through RESIMAO (West African Market Information System Network)

Objectives / Target Groups

Savè is another town of the central region where a PICA has been implemented. Cashew nut is a tree cash crop which is becoming the second important export crop in the country. IFDC/MISTOWA is backing cashew nuts producers to sell their produce and by the way RESIMAO at the sub-region level. RESIMAO aims to link different actors of the market chains throughout West Africa by improving their access to price and other market information. Its beneficiaries include producers and farmers; principal/active actors are traders. They share information on quantities demanded, product quality, places of demand, and agricultural input procurement channels.

Approach / methodology

RESIMAO disseminate price information via Sms for all agricultural products in the region: maize, rice, gari, yams, soya bean, etc. Its area of action is the West Africa region, with regional focal points in Burkina Faso and Nigeria, and two local points in the Collines department of Benin where cashew nuts and rice are produced.

IFDC provided RESIMAO with a technical support in this endeavor through the PICAs of the MISTOWA project (see previous case). The Chairman of the central region's Cashew nut Producers' Union (Dassa-Zoumé and Glazoué) was responsible for the price dissemination to members using the PICA computer.

Contextual problems of implementation and solutions used

According to the local URPAZ-C members, there was no problem. The environment was favorable to the network's activities. Benin cashew nuts are the best worldwide and

this attracts a lot of external exporters, mainly hindo-pakistanese who are very powerful financially. Cashew nut producers need then to benefit market information for their crop in order to help them in their transactions with these kinds of clients.

Outcomes

The intervention was focused on information exchange via Sms. It lasted one year, but the PICA computer functioned only one week. The costs of services for beneficiaries included only airtime in mobile phones. The main achievements of the intervention include the increased aptitude given to beneficiaries to better market their agricultural products. Thanks to the PICA, producers and farmers could compare market information across markets worldwide and achieve greater sales and incomes.

The sustainability of the initiative will depend on availability of funds to collect process and disseminate market information. Some members think it would be too expensive to decentralize the system at the local level and would prefer that a central PICA be kept.

IFDC/MISTOWA support to the CORVO market information system (inspired by a model from farmers' organization in Nigeria) through a PICA

Objectives / target groups

Like other towns in Benin, Malanville, a town located in the upper north of the country, has an association for its development. This association has created an organization for the promotion of agricultural products. This organization is named "Onion Reception and Sale Committee of Malanville Council" (CORVO). The beneficiaries are traders, producers and the city council (taxes revenues). This initiative is inspired from a similar one in Nigeria.

The objectives of this initiative were to reduce or eliminate traders' trickery on farmers and help the latter sell their products while removing production and marketing bottlenecks through the access to market information and agricultural inputs. Beneficiaries include producers and traders.

Approach / methodology

For awareness-raising among themselves, the association uses rotating meetings across the different localities of the council and micro phones and wide speakers for information dissemination.

The intervention used a PICA and relied on an existing market information system. Communication via phone calls was the medium of information dissemination. Market information was collected in some markets of a few West African countries (Benin, Togo, Ghana, Nigeria) and disseminated within the community. A website was also used but it is no longer functional. In Benin, the initiative had a local scope, markets surveyed are those of Malanville and Karimama, and the target products included onions and fertilizers (to a lesser extent). For fertilizers procurement, the initiative partnered with the CeRPA.

Market information included current prices and available quantities. No other service was associated with market information service apart from the support for storage/warehouse management.

Contextual problems of implementation and solutions used/developed

The city council helped the association to overcome its numerous problems. Among these are problems of confidence among the association's members and the one of trust vis-à-vis partners. The local state agricultural service provider (CeCPA) is also helpful in contributing to awareness rising.

There was political interference in the activities of the farmers' organization (CORVO) which led to its split into two wings. As a matter of fact, the internet service provision did not last long and was finally stopped as violence accompanied the attempt of one wing to take away the computer.

The city council is still trying to solve the problem, something which is not easy as Benin is moving closer to presidential and parliamentary elections.

Outcomes

Information diffusion points have been increased as local communities have been contributing. The financial costs of running the system consist of the costs of electricity (60,000 CFA/month), costs of watchman (15,000 CFA/month) and phone call costs (60,000 CFA). Globally the total costs amounted to about one million six hundreds twenty thousands (1,620,000) CFA a year. The association's revenues come from taxes perceived on agricultural produces (100 CFA/bag sold). Twenty percent (20%) of this tax go to the association, fifty percent (50%) to the council, fifteen percent (15%) to the producers' village and fifteen percent (15%) to the village committee.

The initiative generates enough revenues to make it financially sustainable. All beneficiaries have access to the information facilities free of charge till the clash between CORVO members.

However, some members of the project think that the project did not achieve anything in the area. They believe traders and farmers' attendance to the PICA was poor,

which witness a poor functioning of the PICA. Actually, staff in charge of managing the PICA was poorly trained.

Sustainability: The project partners/members think that the model as it was conceived is viable. CORVO should prepare to take over when the external funding will end, with the view to strengthening the capacities of the staff.

IFDC/MISTOWA support to ACOODER (Banikoara farmers' organization) market information system through a PICA

Objectives and target groups

Banikoara is the biggest cotton production commune in Benin with a very powerful farmers'organization (ACOODER). This organization is funded by revenues from cotton production and develops many initiatives among which the Banikoara community radio. Its objective is mainly to provide its rural population with proximity services, as Banikoara was a remote area till recently. The nearest big town Kandi is 85 km far away and the road was then very bad.

The community radio provides a multimedia centre (Centre Multimédia Communautaire de Banikoara, "CMC Banikoara") which hosts a PICA (agricultural market information point "Point d'Information sur le Commerce Agricole"). The latter disseminates market prices of main food crops (sorgum, maize, yam, etc.) to agricultural commodity traders and honey producers. Banikoara is in fact a big honey-producing area as it's close to the National Park of Pendjari. Banikoara's PICA is funded by MISTOWA (Market Information System for Traders' Organization in West Africa) Program run by IFDC (International Centre For soil Fertility and agricultural Development). The support includes, among others, the donation of a computer with all accessories). PICA is a core element of the MISTOWA program (see previous case) initiative. As described earlier, it is a physical facility which is installed close to agricultural producers, but in Banikoara it has collapsed due to the sudden end of the program.

It is worth remembering that the National Office for food Security ONASA ("Office National pour la Sécurité Alimentaire"), which has the mandate to collect price information nationwide for agricultural products, is in practice limited to markets in southern Benin because of funds shortage. ONASA (www.onasa.org) is the focal institution/point of RESIMAO (West African Market Information System Network). RESIMAO includes about twelve countries, namely: Benin, Burkina Faso, Côte d'Ivoire, Guinée Conakry, Mali, Mauritanie, Niger, Nigeria and Senegal and Togo. This network has a web site (www.resimao.org) where price information from West African markets is stored. Each country of the network has a focal institution, responsible of price data collection and dissemination through the web site. (RESIMAO jointly with the participating countries determined approach to price determination, product choice, time length, etc.).

Approach/methodology

IFDC/MISTOWA program in Benin relies on the government local agricultural extension service (CeCPA) namely the field technician ("T Commercialisation") for price data collection on local markets. Prices are collected on market days, three times a day at different moments by the field technician. He has direct access to the community radio for price information dissemination through the radio and price posting on billboards in the markets (almost canceled nowadays), then he sends the data to IFDC headquarter for processing and storage on the web site in Cotonou.

Maize, rice, bean, millet, sorghum, yam, cassava and cotton are the agricultural products concerned with price collection. Price is consumer price and the markets are those in the areas of Alibori, Banikoara, Goumori and Malanville.

Banikoara's PICA also provides computer training and surfing to the population mainly the youth of the community.

Contextual problems of implementation and solutions used

The initiative is built on a private one which is based on local cotton producers' organization. As the area is a remote one, the radio initiative tries to remove this constraint by providing information to the population, something that attracted the IFDC/MISTOWA program. It's then easy to understand why the sudden withdraw of the program has no apparent significant effect on the initiative, as the radio diffusion of price continues. But price data processing and storage by IFDC stopped as well as training and surfing.

Outcomes

The PICA initiative offers price information and computer training, surfing, data entry and photocopy. These services were demanded by the rural population among which the youth. Most of them have benefited these trainings and got their capacities enhanced as well. All these services are free of charge apart from surfing. The local field technician receives remuneration for data collection. Apart from providing a computer as well as its accessories, IFDC trained the local field technician many times. All this lasted six months. Now it's no longer possible to get Banikoara's markets price information on the web site.

IFDC/MISTOWA support to UDOPER B/A (Borgou/Alibori shepherds) market information system through a PICA

Objectives and target groups

Gogounou is another rural town of the northern Benin cotton belt with large herds of cattle and sheep. Cotton production has developed the use of oxen-driven plough, which suits the advantage of cattle production. With the responsibility of the Provincial Professional Shepherds (cattle and sheep) Union of Borgou and Alibori (UDOPER B/A), Gogounou hosts one of the biggest cattle markets of the region which extends to Nigeria in the East. The MISTOWA program of IFDC took this opportunity to implement a PICA for cattle and sheep. The objective is to collect and disseminate price data on crops and cattle and sheep for animal traders via a web site.

Approach/methodology

Prices are collected using the services of the local CeCPA field technician ("T Production Animale"). These prices are disseminated just after their collection via SMS and web site. The products concerned are cattle, sheep and goats. Information on organization (making sure that all members are informed about what is going on in the organization) is collected as well and animal traders are regularly trained through training of trainers (here the shepherd organization coordinator) in the use of Sms.

Contextual problems of implementation and solutions used

This private initiative of provincial professional shepherds in the use of SMS to get information they are looking for has benefited the opening of GSM market to new comers as GLO and MTN which resulted in the relative downward trend of mobile phone price and SMS unit cost.

The approach consisted in storing the information at Gogounou before their diffusion. It happened that this has not been so effective because some failed to provide the information on time.

Outcomes

Actually this PICA, by providing needed information (price data and organization life) to beneficiaries, enhances shepherds' confidence and participation to their organization UDOPER. The costs of running the new communication facility include the price of prepaid airtime ("Télé PLUS" cards) for putting the information on line and sending an SMS. These costs depend on the gsm provider and are charged to beneficiaries. Beneficiaries have nothing to pay to UDOPER.

The initiative was backed two years by MISTOWA/IFDC but it is now running on its own resources, which proves its sustainability.

Private exporters market information system initiative (ADEX)

Objectives and target groups

Private export actors have initiated an association named ADEX (Export Development Association) based in Cotonou, the sea port town of Benin republic. Their objective is to share information related to export of cash crops for their promotion. The actors are: transporters, private enterprises, public administration and embassies.

Approach/methodology

Internet, phone call and email are the means used to share information within the association. And the products concerned are: cashew apple, cashew nuts, pine apple, shrimps and mushrooms (mainly export crops). Information shared is about decision making, technical issues, statistics on quantities exported, etc. Additional services provided to members include training on itineraries, ISO norms, good hygienic practices and processing.

Contextual problems of implementation and solutions used

The national agricultural policy of promoting export is a good environment. But free riders are everywhere, which calls for caution in evaluating the initiative. One has to know its real beneficiaries. Apart from that, tedious procedure, long waiting time before getting funds and the necessity of approval are among others problems encountered.

Outcomes

Trainings and information-sharing are still ongoing. Beneficiaries get services free of charge. The embassies and government (World Bank, European Union, etc.) were those providing the funding, so trying to estimate the costs of the intervention might lead to wrong figures. Furthermore, there is also an internal financing which still is going on. The approach seems sustainable.

ONASA market information system

Objectives and target groups

The National Office/Board for Food Security (ONASA) already engaged in MIS and received funds from

AGRIBUSINESS (internet, SMS) and GTZ (market days calendar) to expand the number of markets and products covered. The objective is the diffusion of actual price (producer, wholesale and consumer) information nationwide to all kind of actors – traders, producers, students and researchers, NGOs, etc.

Approach/methodology

Price information is collected each market day on actually 28 markets (the number fluctuates according to the funds received). Local public extension service agents ("T Commercialisation") are those who collect the data; sometimes they are assisted by occasionally recruited agents, depending on the means/funds devoted. Three times a day, they collect data that are centralized at ONASA headquarters in Cotonou, processed and put online on the web site, and disseminated through about 17 radios among which 5 regularly. Presently, SMS and internet add to the means of market information dissemination. About 29 products are concerned, including imported and processed food crops. The prices disseminated are 14-day round average prices.

In addition to prices, other market information disseminated includes market days, products' flows and market opportunities. Each year, a regional workshop is held with the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS: "Comité Permanent Inter-Etats pour la Lutte contre la Sécheresse au Sahel") to exchange on demand and supply at this supra-national level.

Contextual problems of implementation and solutions used

ONASA uses various means of communication: bulletin, internet, web site, SMS, radio, price posting board in market and phone calls. Price posting on billboards in markets is not easy to handle and its scope is limited. The bulletin is also limited to literate people only, and only a few who enjoy reading were aware of it. Internet and website as well are not yet easily accessible.

Radio is the only mean with large access. But because of the fluctuation of MIS budget, the number of radios that disseminate information declined from 17 to 5 whereas the number of markets surveyed dropped from 64 to 28. In fact ONASA does not cover any market in the northern part of the country due to fund shortage.

Outcomes

The global budget of the ONASA MIS service is evaluated to the amount of 100,000, 000 CFA a year. Each radio is budgeted 500,000 CFA a year for price and market information diffusion. The price and market information collection scheme costs around 60,000,000 CFA a year for 65 markets (ONASA running costs excluded). Although the number of markets as well as radios fluctuates according to the funds received, price as well as market days information for some important markets are still available. The MISTOWA program has helped to build a regional network that facilitates products flows in the sub region. Markets are in the way getting integrated but the national objective of food security sometime impedes it. Public funds are still lacking and there is no indication that agricultural producers' livelihood is improving as the result of this market information system.

Summary of the cases and comparative analysis

ICT based initiatives in Benin date back to many decades. Since 1965, the Office of Agricultural Products Trade of Dahomey (OCAD), a public parastatal, has been providing market information to traders and farmers through radio and billboards and bulletins for researchers. OCAD has changed name many times and finally became ONASA which is today the focal institution of RESIMAO in the country. ONASA has another important objective which is to guarantee national food security by managing a strategic food security buffer stock.

Due to the limited national coverage of ONASA, the IFDC/MISTOWA program backed some local initiatives through farmers' organizations (onion, staple crops, tree cash crop and cattle, sheep and goats). These initiatives focused on PICAs as the main means of market information dissemination, and it is not a surprise that all the PICAs are located in areas that are not covered by ONASA. Their real intention is to inform traders about the existing surplus, meaning that MISTOWA is really biased towards traders. All the PICAs are local; most of them are multi-commodity oriented whereas one is single commodity (cashew nuts in Savè in the centre of the country). As a public institution, ONASA has the mandate of a national coverage, although it couldn't cover the northern part of the country. Nonetheless it is multi-commodity oriented. On the contrary, the PICAs of IFDC/MISTOWA are private. The IFDC/MISTOWA program provides trainings for the use of all these means of new ICTs (Cell phone, SMS, internet and web site). Surely it's not sufficient, and unfortunately the program has been stopped before term.

The ADEX initiative focused mainly on private export actors/institutions. The initiative is backed by the World Bank and other Benin financial partners, as well as the government. Here the issue of quality is of big concern and is included among market information provided. However, the initiative doesn't target farmers and rather focuses on traders, transporters, etc. It is multi-

Table 1. Comparative analysis of the cases

Cases	Geographical scope	New vs upgraded existing MIS	Type of promoters/initiators	Source of funding
PICA Malanville	Local	Single commodity	External	Private
PICA Banikoara	Local	Multi-commodity	External	Private
PICA Gogounou	Local	Multi-commodity	External	Private
PICA Savè	Local	Single commodity	External	Private
PICA Dassa/glazoué	Local	Single commodity	External	Private
ONASA	National/international	Multi-commodity	Public	Public and external donors
ADEX	International	Multi-commodity	Public/Private	External donors

commodity oriented and national. The means of communication have improved while billboards seem old-fashioned and difficult to manage. Cell phone, SMS, internet and web site are now used.

Finally all the initiatives are trying to survive as none is really functioning well. There is no evidence that farmers' livelihoods improved and it seems that traders are those who are benefiting.

Table 1 compares the cases studies and allows for drawing seven lessons. First, the scope (geographical coverage and MIS type) of the interventions depends greatly on financial resources available. Financing, management as well as type of product are crucial for sustainability. But products with active value chains such as cattle can overcome the financing issue. Second, all the interventions relied mostly or totally on external (non-public) funding, which carries the risk of donors' short-term perspectives. However, Government support is crucial for sustainability. Third, all the interventions relied on existing farmers and/or traders' organizations in the interventions areas, thereby carrying forward the strengths and weaknesses of those organizations, but rather their weaknesses – lack of training on MIS/new ICTs, leadership conflicts and funds' diversion hidden agenda of the leaders. In particular, political interference can be harmful. Fourth, the MISTOWA/PICA intervention was unique as it brought its own approach (the PICA (computer-based local relay for market information processing and dissemination) in public support-orphaned regions, with a strong focus on new ICTs (mobile phones/SMS and internet). But there was little training of managers, i.e. a lack of qualified personnel all over the country to induce a timely use of the PICA facility by the targeted beneficiaries. Fifth, a single commodity is not an opportunity to justify a PICA whereas a multi-commodity-based PICA was also difficult to handle. The most important aspect is the activeness of the value chain that would fuel the search and use of market information via an ICT-based information centre. In particular, export crops offer great advantages in that respect. That's the reason why private as well as public-private initiatives in ICT-based information sharing proved to be real and useful in some of the cases examined. Sixth, all the interventions lacked a monitoring and evaluation system as far as resource use efficiency is concerned, and they proved to be non sustainable as there was no strategy for internal cost recovery from the users. Lastly, all the initiatives are trying to survive as none is really functioning well. The value chain perspective lacked (in terms of providing each group of chain actors with the most needed market information) and there is no evidence that farmers' livelihoods improved as a result of these initiatives.

CONCLUSION

This study has compiled and analyzed various cases of ICT interventions in Benin, with the aim of highlighting the main features of their conduct, the contextual problems they faced, and their outcomes. The latter were assessed in terms of program sustainability, appropriation by farmers, increase/diversification of production, improved market access and efficiency, and number of farmers reached. The most important intervention, regarding innovativeness and multiple partnership building, was the MISTOWA project. It was implemented by IFDC with USAID funds to strengthen and complement the ONASA/RESIMAO market information system using the PICA approach in several regions and with various types of organizations to enhance traders' access and use of market information. Farmers were not the main targets, nor were they intended to be the direct beneficiaries of the project. Nonetheless, there was hope that they would also benefit through greater market transparency and greater access to highly rewarding value chains for traders.

The MISTOWA/PICA intervention was unique and

improved access to market information in public support-orphaned regions, with a strong focus on new ICTs (mobile phones/ SMS and internet), but it did not performed very well. Four key lessons for policy and practice are drawn. First, t*he scope* (geographical coverage, MIS type, number of commodities) depended on the *financial resources available. Second, a*ll the interventions relied mostly or totally on *external (non-public) funding,* which carries the risk of donors' short-term perspectives. Third, most of the interventions relied on *existing farmers and/or traders' organizations* characterized by lack of education/training on MIS/new ICTs, leadership conflicts and funds' diversion to hidden agendas. Fourth, the PICA concept was good in its implementation but was poorly monitored, and as a result it did not last more than six months in many locations. The computer-based equipment that is the heart of the system was poorly handled and none of the initiatives really functioned for two reasons. The *value chain perspective* lacked in the intervention's approach (only a few and not necessarily relevant chain actors were targeted, the most needed MI was not timely available). In addition, all the interventions lacked a *monitoring and evaluation system* (not enough benefits to main target groups, poor resource use efficiency) and *sustainability perspective* (quite no strategy of internal cost recovery from the users).

The policy implications of the cases studied in this report are three-fold. The first is that interventions that rely on city-based intermediary beneficiaries will likely fail to reach farmers because of divergence in motivations and inequalities in power relations and resource endowments. Therefore, efforts should be made to target directly farmers' organizations on the ground with appropriate participatory approaches. The second is that the knowledge, training and equipment gaps of external technology interventions in rural Sub-Saharan Africa should be properly assessed and fulfilled before implementing ICT-based market information systems. The last is that attention should be paid to avoiding the spread of scarce donor funds on national/umbrella organizations that have not actually won enough recognition from all stakeholders regarding their capacities, connection to highly rewarding value chains, management transparency and leadership trust. ICT-based interventions aiming at pulling farmers out of poverty through greater access to market information will be very sensitive to the structure of its design on the field, especially its monitoring and evaluation system.

REFERENCES

Adégbidi A (2000). Profile of inequality and Poverty in Benin.Cahier de recherche CREFA, No.00-02 University Laval,Quebec;Canada.

Arrow K (1982). Review of 'Poverty and Famines' by A.K. Sen. The New York Review of Books, 29:24-26.

Badiane O (2000). The effects of liberalization on food markets in Africa, Chapter 7. In A. van Tilburg, HAJ. Moll and A. Kuyvenhoven: Agricultural Markets beyond Liberalization, Boston: Kluwer Academic publishers:147-158.

Barrett C (2008). Smallholder market participation: Concepts and evidence from eastern and southern Africa", in Food Policy 33 (2008)299-317

Barrett C, Swallow B (2006). Fractal Poverty Traps. World Development, 34(1)1-15.

Fafchamps M (1992). Solidarity Networks in Preindustrial Societies: Rational Peasants with a Moral Economy, Economic Development and Cultural Change, 41(1):147-74.

Fafchamps M, Gabre-Madhin E (2006). Agricultural markets in Benin and Malawi, Afri. J. Agric.Res. Econom., African Association of Agricultural Economists,1(1).

Fafchamps M, Vargas Hill R (2005). Selling at the Farmgate or Traveling to Market, Am. J. Agric. Econom., American Agricultural Economics Association, 87(3):717-734, 08.

Jayne TS (1994). Do High Food Marketing Costs Constrain Cash Crop Production? Economic Development and Cultural Change, 42(2):387-402.

Lutz C (1994). The Functioning of the Maize Market in Benin: Spatial and Temporal Arbitrage on the Market of a Staple Food Crop. Amsterdam: University of Amsterdam, Departement of Regional Economics.

MAEP (2007). Plan Stratégique de Relance du Secteur Agricole au Bénin: Orientations stratégiques et Plan d'action. MAEP, Cotonou, Bénin.

Okello JJ, Swinton SM (2007). Compliance with international food safety standards in Kenya's green bean industry: a paired case study of small and large family farms. Review of Agricultural Economics, 29.

Plateforme pour le Commerce Agricole en Afrique de l'Ouest : www.tradenet.biz - www.wa-agritrade.net (1 er juin 2006)

Poulton C, Kydd J, Dorward A (2006). Overcoming market constraints on pro-poor agricultural growth in sub-Saharan Africa, Dev. Policy Rev.:24.

Shiferaw B, Teklewold H (2007).Structure and functioning of chickpea markets in Ethiopia: Evidence based on analyses of value chains linking smallholders and markets. Int. Livestock Res. Institute (ILRI), Addis Ababa, Ethiopia.

Shiferaw BA, Tewodros AK, You L (2008). Technology adoption under seed access constraints and the economic impacts of improved pigeonpea varieties in Tanzania. Agricultural Economics 39:1–15.

Siamwalla A (1978). Farmers and Middleman: Aspects of agricultural marketing in Thailand. Economic Bulletin for Asia and the Pacific, 15(1).

Tamukong J (2007). Analysis of Information and Communication Technology Policies in Africa. PanAfrican Research Agenda on the Pedagogical Integration of ICT

Yin RK (2003). Case Study Research Design and Methods, 3rd Edition, Appl. Soc. Res. methods Series, 5.