Review of agricultural market information systems in sub-Saharan Africa

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List of abbreviations and acronyms

AMIC	Zambia Agricultural Market Information Centre
ANOPACI	National Association of Professional Agricultural Organizations
CIF	Cost, Insurance and Freight
CIRAD	Agricultural Research for Development
CTA	Technical Centre for Agricultural and Rural Cooperation
EAGC	Eastern Africa Grain Council
ECX	Ethiopia Commodity Exchange
FAO	The Food and Agriculture Organization of the United Nations
FOB	Free On Board
ICRAF	World Agroforestry Centre
ICT	Information and Communication Technology
IFAD	International Fund for Agricultural Development
INRA	The National Institute for Research in Agronomy
IVR	Interactive Voice Response
KACE	Kenya Agricultural Commodity Exchange
MACE	Malawi Agricultural Commodity Exchange
MIS	Market Information Systems
MSU	Michigan State University
NGO	Non-Governmental Organization
OdR	The Rice Observatory
OMA	Malian Agricultural Markets Observatory

RATES	Regional Agricultural Trade Expansion Support
RATIN	Regional Agricultural Trade Intelligence Network
SCP	Structure-Conduct-Performance
SIEL	Madagascar Vegetable Market Information Service
SIF	Système d'Information des Filières
SIMA	Mozambique's Information System for Agricultural Markets
SMS	Short Message Service
SSA	Sub-Saharan Africa
TV	Television
UN	United Nations
USA	United States of America
USAID	United States Agency for International Development
WB	World Bank
ZNFU	Zambia National Farmers' Union

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Abstract

Agricultural market information systems (MIS) have been promoted to facilitate efficiency in the marketing of agricultural products and provide information for food security monitoring and policy formulations. This study sought to explore the functioning of MIS and to document lessons learned. Fourteen MIS representing different models were selected and reviewed using the Structure-Conduct-Performance model. Findings indicate that the main goal of these systems is to reduce information asymmetries among actors. Information provided is mostly limited to price and dissemination is through the use of different forms of media.

1. Introduction

Poverty and hunger remain a major concern in sub-Saharan Africa which has the highest incidence of rural poverty in the world. Agricultural development is regarded as one of the most important tools in accomplishing the goals of sustainable growth and substantial poverty reduction in developing countries. According to Schneider and Gugerty (2011), increases in agricultural productivity can reduce poverty through real income changes, employment generation, and rural non-farm multiplier effects. However, marketing of agricultural products remains a major challenge for farmers in sub-Saharan Africa. Some marketing constraints they encounter when attempting to sell their products are usually related to lack of access to market information, information asymmetry between producers and sellers, and poorly organized input markets.

From an economic standpoint, the performance of markets depends primarily on the quality of information circulating among the various actors. However, economic agents often have incomplete and sometimes false information (Svensson and Yanagizawa 2009). Moreover, information asymmetries are frequent: traders on their part have better access to information while producers are often isolated, dispersed and are generally poorly informed. This difference in the access to information leads to inequitable price formation, which is often to the disadvantage of the producers (CTA 2008).

It is because of these and other reasons that organizations involved in the development of agricultural marketing advocate for the establishment of market information systems as a means of increasing the efficiency of marketing systems and promoting improved price formation. The need for such systems became most evident after liberalization of agricultural markets in the 1980s as part of the economic structural adjustment programmes (Tollens, 2006). The government no longer had monopoly over information as it was now in the hands of actors involved in the marketing of agricultural products.

MIS thus evolved in the 1980s as accompanying measures to economic liberalization when governments stopped intervening directly in major export and domestic food crop markets (Tollens, 2006). Today, in an attempt to link farmers to more profitable market opportunities and foster greater regional trade, many and sometimes competing models of agricultural MIS

co-exist in sub-Saharan Africa. Despite the co-existence of these different MIS models, little is known about their scope, context in which they occur, level of variability, determinants of successes and failures. Against this background, the study aims to review typologies of agricultural MIS in sub-Saharan Africa and document lessons learnt from past experiences. This review will enable better understanding of gaps in existing systems, and enable donors, governments and other private organizations to better understand important key points in the set-up and management of sustainable systems. Farmers, traders and other stakeholders will better understand the importance and roles of these systems.

2. Theoretical framework

The structure-conduct-performance model

The structure-conduct-performance (SCP) is the theoretical approach adopted for this review. This model is one of the most popular approaches to market analyses. Several studies in agricultural marketing based on the assessment of the free-market system have been conducted using this approach. Amongst other authors, it has been used by Kizito (2011) to analyse agricultural MIS in Africa and Tiku et al (2012) to analyse palm oil marketing in Nigeria.

SCP is used as an analytical framework to make relations amongst market structure, market conduct and market performance. The model is based on the neoclassical economic theory and stipulates that there is a causal relationship between the structure of an industry, the behaviour of firms, and ultimately the performance of that behaviour (Finlay 2007).

According to Kizito (2008) the various features of the SCP model include the following:

- Structure refers to the characteristics of market organizations, such as, the number of consumers and the degree of market power. Some examples of the elements of structure include the number of buyers and sellers in the market, barriers to entry and exit and the vertical coordination mechanisms.
- Conduct is related to the firms' product strategies, innovation and advertising. It includes the patterns of behaviour that market participants adopt to affect or adjust to the markets in which they sell or buy goods and services. Examples of conduct include price-setting behaviour and buying and selling practices.
- Performance is associated with market structure and strategies (behaviour). It refers to how well the market fulfills certain social and private objectives such as price levels and price stability in the long- and short-term, profit levels, costs, efficiency, quantities and quality of food commodities sold.

Features of the SCP model have been modified (Kizito 2011) to suit market information systems as indicated in figure 1 below.

(Source: adapted from Kizito 2011)

Figure 1: Structure-Conduct-Performance model

3. Methods

In order to select different systems included in this study, purposive sampling was conducted. This was done so as to have a broad picture of MIS in SSA and also to represent the various models of MIS as described by Kizito (2011). The intention was to include both first and second generation MIS.

First generation MIS

The first generation MIS (1980-1990) were almost all based on a similar model (CTA 2008):

- Each system was focused on a particular country and a group of products (cereals, cattle, etc.);
- The information was related primarily to prices;
- Information was collected based on a sample of markets before being centralized, selected and then disseminated on a national scale through radio and other media;
- The information was provided free of charge to the actors;
- The MIS were centrally managed by public services (government) or projects (financed by development aid).

These systems, also known as public MIS, are mostly housed in government ministries, departments, or semi-autonomous bodies. Their mandate was to help attain efficient and “fairer” markets, and to provide information for the design of better policy and monitoring market performance (Kizito 2011).

The first generation models had mitigated results; a major study on 120 first generation MIS in developing countries carried out by FAO in 1996, revealed that only 53 of them fulfilled the minimum operations criteria (CTA 2008). Even though they succeeded in providing information to institutional decision makers on the evolution of agricultural product prices, their impact was relatively weak on the market structures and the behaviour of agricultural producers. They did not meet specific information requirements, especially those of the producers, in a timely manner.

Second generation MIS

Second generation MIS emerged towards the end of the 1990s. These rely heavily on information and communication technologies (ICTs) to collate and disseminate information, through the Internet and mobile phone networks. Before, transmission of price data from the collection point to the central unit, would take several days. But with the second generation MIS, “real time” information can be delivered within a few hours. In addition, the systems have extended their reach, beyond providing simple market prices to offering information on a host of issues, from individual offers and demands (virtual market place) to advice on crops, pests and inputs. Another fundamental change is the possibility of interactivity, enabling a two-way connection, for example, between farmers and markets or extension agents (David-Benz et al 2012a).

Second generation MIS are further divided into three main types (Kizito 2011). These are:

- Farmer organization-based MIS: they are managed by farmer organizations. Examples include: Malian Agricultural Markets Observatory (OMA); Zambia National Farmers’ Union SMS MIS (ZNFU 4455); Madagascar Vegetable Market Information Service (SIEL); and the National Association of Professional Agricultural Organizations (ANOPACI).
- Private MIS: these are private entities that provide information but are not involved in trade of agricultural commodities. Examples include Esoko in Ghana and Infotrade in Uganda, and those attached to emerging commodity exchanges such as the Kenya Agricultural Commodity Exchange (KACE) and Malawi Agricultural Commodity Exchange (MACE).
- Trader and NGO-based MIS: these are run by trader organizations or associations such as the Regional Agricultural Trade Intelligence Network (RATIN), housed in a trader organization (Eastern Africa Grain Council); and the Rice Observatory (OdR), a consortium of rice value chain actors in Madagascar.

Sampling method

Through the collaboration of the National Institute for Research in Agronomy (INRA), International Cooperation Centre in Agronomic Research for Development (CIRAD), Michigan State University (MSU) and other partners, a total of 85 MIS were identified in 2009, out of which 53 were based in sub-Saharan Africa (David-Benz et al 2012b). This list may not be exhaustive, but is a true reflection of existing MIS in the region. The 14 MIS which were purposively selected for this study were drawn from the 53.

Four private, four public, four farmer-based organizations and two trader-NGO MIS were reviewed. In order to ensure that every type of MIS was well represented, preliminary information regarding the system was researched from the Internet. The final selection comprised those with sufficient information regarding structure, conduct and performance.

Table 1 presents the different systems that were reviewed. Information was obtained from journal articles, reports and dissertations including Kizito et al (2012); Gabre-Madhin (2012); David-Benz et al (2012a); David-West (2011); and USAID/COMPETE (2012).

Table 1: Market information systems reviewed

MIS type	MIS name	Country
Public MIS	Cocoa and Coffee Market Information System (“Système d’information des Filières Cacao et Café”, SIF)	Cameroon
	The Mozambique Information System for Agricultural Markets (SIMA)	Mozambique
	The Zambia Agricultural Market Information Centre (AMIC)	Zambia
	The Ethiopia Commodity Exchange (ECX) Market Information Section	Ethiopia
Farmer-based organization MIS	Agricultural Markets Observatory (“Observatoire du Marché Agricole”, OMA)	Mali
	Zambia National Farmers’ Union SMS MIS (ZNFU 4455)	Zambia
	Vegetable market information service (“Service d’information Economique des Legumes”, SIEL)	Madagascar
	National Association of Professional Agricultural Organizations (ANOPACI)	Cote d'Ivoire
Private MIS	Kenya Agricultural Commodity Exchange (KACE)	Kenya
	Esoko	Ghana

MIS type	MIS name	Country
	Malawi Agricultural Commodity Exchange (MACE)	Malawi
	Infotrade	Uganda
Trader- and NGO-based MIS	The Rice Observatory (“Observatoire du Riz”, OdR)	Madagascar
	Regional Agricultural Trade Intelligence Network (RATIN)	Kenya and East Africa

Source: Compiled by author

Information used for this study was obtained exclusively from the Internet. The search was performed using the MIS name in combination with other key words (motivation/objectives management, funding, etc.) through Google, Google Scholar and Scirus. Information was from published and unpublished sources (conference/workshop and seminar presentations, theses/dissertations, project reports/documents, policy briefs, working papers and journal articles).

During the review process, focus was on the following elements of the SCP paradigm:

a. Structure

- The mandate of the MIS: what are the main objectives of the MIS and which groups make up the clientele served?
- Institutional home, organization and coordination: is the MIS public, private, farmer-, trader- or/and NGO-based?
- What is the geographical coverage and nature of commodities covered by the MIS?
- What is the ownership and management structure?

b. Conduct

- What are the methods used to collect market information?
- What type of information is disseminated by the MIS (prices, availability, product flow)?
- Means of information dissemination: traditional ICTs such as radio and newspapers or modern ICTs such as SMS and Internet?
- Funding strategies: does the MIS completely rely on donors for support, collect service fees from users or engage in other income-generating activities?
- The type of products covered.

c. Performance

- Accessibility to different clientele: do the dissemination methods allow the MIS to reach the maximum number of clientele?
- Sustainability of the MIS: are different funding strategies employed geared to guarantee viability of the MIS in the long run?

4. Findings

Public MIS

Structure

Public MIS, also known as first generation MIS, were generally set up in the 1990s by governments after the liberalization policies to reduce information asymmetries between farmers and traders. These MIS are mostly managed by government departments and ministries, with the exception of ECX in Ethiopia which is a public-private partnership co-managed by the government, traders and shareholders.

Apart from ECX set up in 2008, the other public MIS reviewed (SIMA, AMIC and SIF) were set up in the early 1990s in order to: help attain efficient and fairer markets, provide information for the design of better policy and complement liberalization policies. The MIS were designed to have a national coverage, collecting market information from markets in different regions in the country. SIF in Cameroon is an exception because it is product-specific (cocoa and coffee) and thus collects information only in the southern regions of the country where these products are produced.

Conduct

The main means of data collection by public market information systems is through interviews at market level and also through observation. ECX gets its information through various transactions on the exchange. The key information disseminated through these MIS is price, which are sometimes complemented with exchange rates, quantities and transport costs. The most recurrent means of information dissemination used by public MIS is the radio. Other means commonly used are news bulletins and the Internet.

An important means of information dissemination for ECX is text messages which are sent to subscribers. Among the MIS reviewed under this section, ECX and SIF have websites that are frequently updated. That of Mozambique's SIMA is not functional as it was last updated in January 2010 while AMIC does not have a website. Apart from ECX which obtains part of

its funding from members' contributions, these MIS depend entirely on funding from their governments and donors.

Private MIS

Structure

Private systems reviewed include KACE, Esoko, MACE and Infotrade. MACE and KACE are in private-sector based commodity exchanges while Infotrade and Esoko evolved from donor-financed project-based systems to independent commercial standalone systems. These systems are private sector MIS firms and operate as fully independent business entities. They are mainly profit-oriented and aim at better linking farmers to traders at national and even regional levels. All these systems have national coverage and collect information on a wide variety of agricultural commodities including animal products, cereals, fish, fruits, poultry products and pulses.

Conduct

Private MIS mainly use market-level interviews and observation by reporters to collect information which it disseminates to users. Information collected is mainly price related, but some such as Esoko and MACE also provide information on bids, offers and quantities. They are the most advanced systems in terms of use of modern ICT – Internet and SMS.

Private MIS collect information from a wide variety of commodities ranging from fertilizers, livestock, cereals, vegetables, etc., with Esoko collecting and disseminating data for up to 60 commodities.

Private MIS get their funding from shareholders, subscription fees from members, proceeds from their activities, franchises, governments and other donors.

Farmer-based organization MIS

Structure

Farmer-based organization MIS (OMA, ZNFU, SIEL and ANOPACI) were set up by farmers' organizations with the help of donors. Contrary to the others, OMA started as the national MIS in Mali and was later restructured and moved from the Grain Board to the Permanent Assembly of the Chambers of Agriculture of Mali so as to better serve the information needs of producers, traders and processors. Their main objective was to promote sustainable economic development amongst members and smallholder farmers by increasing

their bargaining power to negotiate for better prices, and to link them up with traders. These MIS are owned and managed by the respective farmers' unions. The MIS in this category have national coverage, collecting information from different markets in all parts of their respective countries.

Conduct

Farmer-based organization MIS use either physical or telephone interviews to gather information in various markets across the country. The key information collected is price of products which is complemented in some cases, with quantities and quality (SIEL and ANOPACI). Notice boards, bulletins, television, radio and websites are used in disseminating information collected, with ZNFU being the only one that uses SMS. The commodities on which market information is collected range from cereals, vegetables, fruits and livestock.

The main source of funding for these MIS include users' subscription fees, NGOs and other donors, governments and proceeds from other income-generating activities.

Trader- and NGO-based market information system

Structure

The Regional Agricultural Trade Intelligence Network (RATIN) is housed by the Eastern Africa Grain Council (EAGC), a trader organization, while the Rice Observatory (OdR) is a consortium of the rice value chain actors in Madagascar. OdR was created in 2004 in response to a crisis (that was due to an inadequate assessment of supply and a lack of coordination between state agencies and private actors) that strongly destabilized rice prices on the domestic market in Madagascar which resulted in a domestic price increase of rice of up to 150%.

In 2007, EAGC was launched under the RATES (Regional Agricultural Trade Expansion Support) programme and from then on, started running the RATIN MIS. RATIN provides information on maize, beans, sorghum, rice, wheat and millet. OdR, on its part, provides information on rice, sugar, flour and kerosene. RATIN has a regional coverage (East Africa) while OdR is national.

Conduct

The main means of information collection by these MIS is through interviews and observation by reporters. OdR offers only price information while RATIN, in addition to FOB and CIF prices, gives information on informal trade data, formal, inter-regional, cross-

border trade and wholesale market prices. Information is disseminated through bulletins, economic situation reports, SMS and email for OdR while RATIN uses the radio, television, and Internet.

The Rice Observatory obtains its funding from the government and donors, while RATIN obtains funding from the East African Grain Council, and subscription fees from members. The Rice Observatory collects information from 119 districts in Madagascar while RATIN, which is a regional system, collects information from 11 border points and 35 internal markets in East Africa (Kenya, Uganda, Tanzania, Burundi and Rwanda).

Table 2: Summary of elements of conduct of various MIS

MIS Type	MIS Name	Data collection methods	Information disseminated	ICT used	Funding strategies
Public MIS	SIF Cameroon	Interviews	CIF and FOB prices	Radio, website and bulletins	Government, donors
	SIMA Mozambique	Interviews, observation by reporters	Prices, availability, product flow, transport costs	Weekly bulletin, radio, email, website, notice boards	Government, donors
	AMIC Zambia	Interviews	Prices and exchange rates.	Radio and email	Government, donors
	ECX Ethiopia	By product of transactions on the exchange	Date, time, grade, price and volume traded	Website, radio, TV, Electronic ticker board, print media, SMS, toll-free phone	Government, donors members' contributions
Farmer organization based MIS	OMA Mali	Interviews, observation by reporters	Prices	Bulletins, television, radio, website, email.	Government, donors, proceeds from its services, grants.
	ZNFU 4455 Zambia	Telephone interviews	Price	SMS, website, magazine, radio.	Government, donors, users' subscription.
	SIEL Madagascar	Interviews, observation by reporters	Prices and quantities exchanged	Notice board, newspapers and radio	FERT, FIFATA
	ANOPACI Ivory Coast	Interviews	Prices, quality, quantity, market trends	Radio, billboards, website.	Members' contributions, donors
Private MIS	KACE Kenya	Interviews, observation by reporters	Price and availability	Market resource centres, SMS, IVR, Internet database system, radio.	Shareholders, proceeds from activities,

MIS Type	MIS Name	Data collection methods	Information disseminated	ICT used	Funding strategies
					donors
	Esoko Ghana	Interviews, observation by reporters	Price	Website and SMS	Subscription fees, donors
	MACE Malawi	Interviews	Types, quantities, quality and prices	Market information points and centres, the hub, radio, SMS, IVR, website, notice boards, email.	Government, donors, proceeds from activities
	Infotrade Uganda	Observation by reporters	Price	Website, SMS, notice boards, email, radio, Market Analysis Report.	Government, donors, subscriptions, partnerships and franchises
Trader-NGO based MIS	OdR Madagascar	Phone interviews, questionnaires mailed to market participants and other administrative sources	Price	Bulletins, consultation and discussion meetings with actors, economic situation reports, SMS, Email	Government, donors
	RATIN East Africa	Interviews, observation by reporters	Prices (FOB and CIF) informal trade data, formal trade, inter-regional trade and cross border trade wholesale market prices	Bulletin, TV, radio, telephone, newspaper, website	EAGC, subscription fees, donors

Performance

Accessibility to different clientele

Initially, first generation models relied on the radio, print media and notice boards for dissemination of market information. By the early 2000s, new models of MIS evolved mainly as a result of the emergence of ICTs. Modern ICTs now offer unprecedented potential to deliver information to poor rural communities and link them to remunerative markets. In fact, apart from SIEL, all the 14 systems reviewed use Internet and/or SMS for information dissemination.

However, the use of traditional means of data dissemination, especially radio, should not be abandoned because not all remote areas have access to telephone networks or Internet connections, and even when available, some farmers have difficulties using them. Moreover,

the use of mobile phones and Internet in most cases require subscription fees which may not be affordable to smallholder farmers. Therefore, if market information systems aim to target a wider share of the rural population and enhance farmers' understanding of markets, there is need to combine different dissemination media (radio, mobile phones, Internet, notice boards, etc.) and ensure that these are affordable so that users are willing and able to pay (CTA 2008).

MIS sustainability

Funding and financial sustainability is one of the biggest challenges of MIS as they are costly to set up and operate. MIS (even those that sell most of their services) are still largely dependent on donor/government funds to survive. The main donors of MIS in SSA include USAID, CTA, Rockefeller Foundation, IFAD, WB and FAO. Some MIS reviewed started off with complete funding as projects and later, either became institutionalized such as SIMA in Mozambique, or had to develop mechanisms of sustainability such as Infotrade in Uganda.

Private-based MIS have tried to raise funds through sale of information to market operators, but self-financing remains highly marginal and financial sustainability still a major challenge, as they continue to rely on project funds or support from private foundations. Price information however, has been reported to be a public good that should be freely available to all users, otherwise it would disadvantage those unable to pay (David-Benz et al 2012a).

The need to switch towards public-private partnerships arises as an opportunity to ensure financial sustainability of MIS (like in the case of Infotrade Uganda) where free dissemination of basic information can be supported by public resources, while selling more elaborate or specific information (e.g. market analysis, quality specifications, individual advice), and providing complementary income-generating services (e.g. brokerage, warehouse receipt system, storage, information package backing contracts between agrobusinesses and farmers).

5. Discussions

Irrespective of the institutional home of market information systems, their main objective is to create transparent markets by providing information to various stakeholders in agricultural value chains. Key clientele include farmers, traders and governments.

Particular elements of conduct do not necessarily depend on the type of MIS in question, and cannot be attributed to any MIS based solely on its model. Information is mostly collected through structured questionnaires (one-on-one interviews) and observation by market reporters. Other means used by OdR to collect market information include telephone interviews, administrative sources and mailing questionnaires to market participants; while the ECX collects information as a by-product of transactions on the exchange.

Regarding the information transmitted through the MIS, majority of the systems disseminate different types of price information (FOB, CIF, farm gate, wholesale, retail). Some information systems that go beyond market prices and offer supplementary market information include SIMA, ECX, SIEL, ANOPACI and MACE (such as availability, quantities, quality and volume of commodities traded, plus transportation costs).

Regarding dissemination methods, MIS reviewed use a combination of traditional (radio, TV, print media) and modern ICT (Internet and SMS) to reach their clientele. Esoko, which is a private and typical second generation MIS, exclusively uses their website and sends text messages to subscribers. Public MIS, which were mostly first generation, have today included the use of modern ICT to help reach users more efficiently and in a timely manner.

Irrespective of the model, governments and donors are important sources of funding for these systems. Donors include USAID, UN missions, universities and other projects. For public MIS, apart from ECX, all the others get their funding exclusively from governments and donors. ECX is unique in the sense that it is a demutualized entity; the owners, members and management are separate by law. It is set up as a public-private partnership balancing the interests of its promoter (the Government of Ethiopia) with those of the private traders who are the members of the exchange and who hold permanent, exclusive and freely transferable membership seats. The establishment of ECX was funded by the Government of Ethiopia and a consortium of financing partners and the running costs are covered by members'

contributions, who indirectly pay for the information through membership seat fees, annual maintenance fees, transaction fees and warehouse fees.

In addition to government and donor support, private, farmer-based organizations and trader-NGO-based MIS obtain funding through subscription fees, shareholders and proceeds from their activities. For example, OMA obtains some of its funding from specialized market research at the request of customers such as the government and donors.

6. Conclusions and recommendations

The study revealed that information was collected mostly through one-on-one interviews by market agents, observation, and through phones. The major dissemination methods used include modern ICTs (SMS, Internet) and other traditional ICTs such as radio, notice boards and print media. Information provided is mostly price-based.

Some MIS provide information on a limited range of commodities (for example SIEL Madagascar and SIF Cameroon), while others cover a wider range of cereals, vegetables, tubers and other staple and cash crops (Esoko, Infotrade, KACE). Apart from private MIS that secure additional funding from shareholders, proceeds from activities and users' subscriptions, most of the other MIS rely on government and donor funding for survival, which raises the question of sustainability.

In some cases (private MIS) users are required to pay for the information provided, but basic price information has been considered a public good that has to be provided for free. From the examination of these types of MIS, it is clear that specific elements of structure-conduct-performance cannot be attributed to any MIS based solely on its model.

Some lessons/recommendations from the study are discussed below.

Recommendations on the information needs

Market information systems should not just be used to provide prices of commodities. They should aim to provide comprehensive and analytical information, explaining market situation determinants, price formation from farm to consumer, interactions with regional or international markets, etc. The different systems reviewed mostly provide different types of price information and to a lesser extent, quantities, availability and product flow. In order for MIS to support policy decisions, they must provide comprehensive and analytical information, explaining market situation determinants, price formation from farm to consumer and interactions with regional or international markets (CTA 2008). Some MIS succeeded in playing a major role in policy and food-security monitoring. For example, in 2007 the OdR in Madagascar carried an alert on the possibility of a sharp increase in world

food prices. This led to the importation of rice and the constitution of security stock before world prices peaked. Consequently, the country was saved from the negative impacts of the world food crisis which was experienced in 2008.

Complementary information on market trends, contacts with commercial partners, bids and offers could also be useful to farmers and traders. There is therefore need to strengthen data collection mechanisms in order to satisfy the information needs of farmers and other users of MIS.

Recommendations related to number of commodities

Regarding commodities covered by MIS, a commodity-neutral information system is of greater benefit to the majority of smallholder farmers, as the same farmers usually grow more than one crop. Before the liberalization policies, the markets of export products were long managed by the state but after liberalization, states had to abandon their market regulation role. This explains why some MIS cover just a few commodities which were the main export commodities before the liberalization era (e.g., SIF in Cameroon covers just cocoa and coffee). Additionally, some MIS emerged as project-based, targeting just the few products involved in the project (e.g., SIEL, OdR). However, after liberalization of markets some non-traditional exports such as food crops (e.g. rice), some fruits, vegetables and spices are gradually penetrating international markets.

Domestically, more commodities are finding their way into the market and there have been changes in commodities in the market in terms of volume, type and form. For instance, some commodities that were traditionally grown for subsistence in the past have become more popular and are now produced commercially. In addition, more commodities are now being processed and packed before being sold to consumers as a way of adding value to them. These MIS need to be flexible and take advantage of market opportunities.

Recommendations on the organization and operations

For public MIS, links with professional organizations such as national farmers' organizations, or chambers of agriculture can provide more incentives to meet farmers' needs and contribute to strengthening the advocacy capacity of farmers' organizations, which often have a limited voice in policy dialogue in developing countries. A good example of this kind of partnership is that of ECX in Ethiopia which is a public-private partnership, co-managed by the government and shareholders.

Additionally, it is important to place MIS in a structure where the users of its services can demand accountability and put pressure on the system to improve on performance. Management of the system must be fluid and efficient, because if the system is under heavy bureaucratic management (like the state), it will be less able to adapt to market dynamics and respond to emerging needs.

Furthermore, basic market information such as price information provision must be seen as a public good freely available to all users. There is need for MIS to switch towards public-private partnerships where free dissemination of basic information can be supported by public resources, while selling more elaborate or specific information (e.g. market analysis, quality specifications, individual advice), and providing complementary income-generating services (e.g. brokerage, warehouse receipt system, storage).

Recommendation on dissemination methods

There is need to combine different media for dissemination such as the radio, mobile phones, internet, notice boards, etc. In cases where MIS provide much more than price information, regarded as a public (free) good, supplementary information should also be sold at an affordable cost. The move towards modern ICTs is encouraged, but traditional means of dissemination (radio, print media and notice boards) should not be abandoned since a great majority of smallholder farmers have no access to, and are unable to use modern ICTs.

Recommendation on sources of funding

Funding is a major issue when it comes to MIS and these systems often face financial challenges when donor support is withdrawn. It is therefore important to build a committed base of MIS clients who value the output of the system and thus support it directly through user fees. Financial support can also be obtained through lobbying by committed clients for government/donor support. Sustainability can also be ensured by linking MIS to other market instruments (warehouse receipt systems, commodity exchanges, etc.).

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