Strengthening the impact of African agricultural MISs on policies and market efficiency

1. AMISs at a crossroads

AMISs—tools aimed at improving policies and markets

Agriculture Market Information Systems (AMISs) seek to collect, process and disseminate information on the situation and the dynamics of agricultural markets. In the 80s and the 90s, an unprecedented number of AMISs were created in developing countries, mainly spurred on by the public sector. Developed tools to support the liberalization of agricultural markets, AMISs sought to fulfill two linked objectives: improving public policies through increased awareness of market realities and increasing market transparency in order to induce a fair and efficient allocation of resources. AMISs were more specifically developed for products directly linked to food security (such as cereals).

A diversity of models

First-generation AMISs (created in the 80s and 90s) were all based on a similar model, regardless of the type of product and the country concerned; in most cases, only one type of product was covered (cereals, cattle…), with an almost exclusive focus on prices. The model also involved nation-wide coverage, radio broadcasts, partnership with public institutions (marketing boards, agricultural ministries, etc.) and project-based funding. At the end of the 90s and in the 2000s, second-generation AMISs were created, either through modification of existing AMISs or the birth of new entities. These second-generation AMISs (2GAMISs) often rely heavily on information and communication technologies (ICT) both as an internal means of communication (for transmission of information between market enumerators and the AMIS management units) as well as for disseminating information to public decision makers and private actors (through the Internet and mobile phone networks). These new technologies have brought about organizational innovations. Dissemination through SMS messaging, for example, helped develop user-paid information services, opening a new market for private companies. As a result, today there is a great diversity of AMISs models targeted at different users (public decision-makers, farmers, traders, manufacturers, etc.). This diversity is reflected in the type of products that are covered, the variables that are taken into account (average prices by locality, but also market flows, inventory levels, offers to buy and sell), geographical coverage (local, national or regional), means of dissemination (radio, TV, billboards,

bulletins, Internet, SMS messaging), institutional home of the AMIS (public structures, private companies, interprofessional organizations, chambers of agriculture, farmers' organizations) and the sources of funding (national budgets, projects funded with the help of international organizations, user fees).

Learning from past experiences

Ever since their creation, AMISs have been confronted with technical difficulties (reliability of information, dissemination speed, lack of feedback on the end use of disseminated information, lack of analysis), institutional difficulties (lack of incentives to innovate in order to better satisfy user needs, administrative rigidities) and financial difficulties (short-term project-based funding). Can technical and organizational innovations delivered by 2GAMISs help solve these problems? In order to answer this question, two research projects were set up, one by CIRAD and INRA with funding by the AFD and the CTA (www.sim2g.org), and the second by the MSU with funding by the Hewlett Foundation (http://aec.msu.edu/fs2/wamip_II/index.htm). The results of these two research studies were discussed during an international workshop held in Bamako (30 November – 2 December 2011), which brought together the representatives of thirty AMISs in Africa and other parts of the world (such as India), different AMIS networks (AMIS of the Americas, AMIS of West Africa), Africa-wide and international information systems (FEWSNET, GIEWS -- FAO), regional organizations (ECOWAS, CILSS, COMESA, United Nations Economic Commission for Africa), funders, market participants (farmers and traders) and partners involved in the field of research. Both these studies showed the benefits as well as the limits of innovations delivered by 2GAMISs (Kizito (2011); David-Benz *and al.*, 2012), and led to the formulation of a set of recommendations, which are summarized in the present note. These recommendations will be discussed in the following order: recommendations aimed at *i)* better informing public policies, *ii)* improving the functioning of markets and *iii)* improving AMISs and making them sustainable.

2. Market information for informing public policies

This has remained a prime function of AMISs ever since their founding. However, this function has been abandoned by a large number of 2GAMISs, which have specialized in the rapid dissemination of information to private actors. The recent context of increased market instability and a renewed interest in the role played by the state in developing agriculture and regulating markets have emphasized the necessity of developing market management and monitoring tools. This is particularly true for implementing price stabilization policies and emergency aid programs and, on a more general level, for all agricultural, food and trade policies. It should be noted that the recommendations of the G20 agricultural meeting stressed the urgent need to support and boost this type of market monitoring system, on both a global and a regional scale.

Developing analysis

The information currently delivered by a majority of AMISs is limited to raw data on price trends, with at best a short description of these trends. This type of information is crucial, and its 'factual

neutrality' is an asset; however it is often insufficient. In order to make informed choices, decision makers also need more in-depth analyses of market trends, and possibly memos presenting different alternative policies with their advantages and disadvantages. AMISs often lack the human resources required for carrying out these types of analyses. These limits can be overcome through training (developing skills) and developing partnerships with universities and research centers (for example, contracts could be negotiated whereby researchers could have free access to data if in return they agree to carry out the analyses required by the AMIS). However, as analyses can easily be manipulated, these two functions—price information and analysis—should remain independent.

Informing all concerned by agricultural policies

Nowadays, policies are increasingly implemented in conjunction with stakeholders (farmers' organizations, bodies representing traders and manufacturers, consumer protection organizations). This implies that the analyses carried out by AMISs should not be exclusively directed towards public-sector decision-makers, but should be made accessible to all market participants. The mission of AMISs should be extended to playing a role as a facilitator of discussions between state agencies and private entities when agricultural policies are being developed (see box below on the case of Madagascar).

Fuelling the discussion between state agencies and private entities during the development of rice policies: The Rice Observatory in Madagascar

The Rice Observatory (OdR) was created in 2004, in response to a crisis that strongly destabilized rice prices on the domestic market in Madagascar. (This crisis was due to an inadequate assessment of supply and a lack of coordination between state agencies and private actors). In addition to the OdR, a platform for joint consultation was created in order to involve the different actors in the value chain in the process of developing rice policies. This particular context explains why the mission of the OdR extends beyond the 'usual' functions of an ordinary AMIS (monitoring and disseminating commodity prices, producing analytic reports). In fact, the OdR took part in all the meetings of the consultative platform, and fuelled the debates with an updated analysis of the national and international economic context. A better anticipation of market trends and more predictable public interventions helped to prevent soaring prices on the Malagasy market when world rice prices sky-rocketed in 2008. The consultative platform has suspended its activities since 2009 (due to the political crisis), but the OdR is still invited to attend the meetings between the main private-sector participants and the state, which are periodically organized by the Prime Minister's office and the Ministry of Commerce.

3. Improving market performance

The main idea behind AMISs is that well-informed economic agents make better decisions regarding when to buy and sell (temporal arbitrage) and where to buy and sell (spatial arbitrage). This, in turn, should lead to more integrated markets and more stable prices. Furthermore, by correcting the asymmetry of information between the different market participants, the objective of AMISs is to increase the bargaining power of the smaller entities

(such as farmers and consumers), which should help reduce marketing margins.

In reality, the impact of AMISs on market performance is often limited by the inadequate balance between the supply of information and the demand for information stemming from market participants (Galtier and Egg, 2003). This inadequacy is explained by the fact that private economic actors i) rely on their own sources of information and ii) are faced with a number of constraints (transport, credit, etc.) that prevent them from being able to use the information delivered by AMISs to their own advantage. The rapid dissemination of information through mobile phone networks in African cities and agricultural regions has profoundly modified the nature of the problem: not only has it helped improve the performance of AMISs (by reducing the length of time required for centralizing and disseminating information, and by offering a new means of dissemination to market participants), but it has also increased the capacity of individuals to inform themselves. More than ever before, it is crucial for AMISs to take action in order to: *i)* adjust the supply of information to meet the needs of market participants, *ii)* improve access to information for the greatest number and *iii)* link AMISs to other market tools so as to relieve some of the constraints preventing market participants from being able to use the information that is being disseminated.

Generating feedback on the end use of disseminated information

A recurrent difficulty with AMISs is the lack of feedback on the end use of the information that has been disseminated. In order to have an impact, AMISs must disseminate useful information that market participants cannot access through other channels. In order to achieve this, AMISs must be interactive, which is to say they must be capable of generating feedback on user needs.

Many AMISs occasionally carry out surveys in order to assess the needs of market participants, their sources of information and their opinions of the information disseminated by the AMISs. However, in most cases, the results of these surveys only deliver general information, which cannot be used by AMISs to drive improvement through self-evaluation and refocusing of their activities. More recently, a number of surveys have been carried out in order to analyze the impact of AMISs on the behavior and marketing performance of farmers (see paragraph below on impact studies). These studies could potentially be very useful in helping AMISs better understand the impact of the information they disseminate. However the scope of these studies is limited: they only cover certain market participants, certain behaviors and certain regions. Furthermore, as these studies require wide-scale surveys and sophisticated econometric analyses, they cannot be carried out very often.

What AMISs need most is regular feedback on the end use of the information they disseminate. One way of facilitating this type of feedback consists of bringing AMISs closer to users by integrating them within professional organizations that represent market participants. The Agricultural Market Observatory (Mali) is an instructive example of this. The AMIS was originally based in the Malian Grain Marketing Board (OPAM). It was later transferred to the Chamber of Agriculture and its working structure was decentralized (different information is disseminated in different regions, and the content of radio

broadcasts is developed by local AMIS agents). In order to make sure this method truly generates feedback on user needs, the system must be properly organized (for example, by holding regular meetings with a sample of market participants).

ICTs offer new means of generating feedback on the end use of disseminated information. Using SMS messaging and the Web to disseminate information means that users have access to a wider range of information and can select the information that interests them the most. By tracking user-selected information (number of requests sent to the AMIS and the number of downloads), AMISs can evaluate the use that has been made of the different information made available to users. This is a potentially powerful tool in terms of driving improvement through self-evaluation, as it can be used to test new information and evaluate the amount of interest it generates among market participants. However, in practice, this type of feedback is rarely used by AMISs. Some of the AMISs that use SMS messaging to disseminate information use a 'push' system (whereby information is automatically sent out to the user's mobile phone). This type of system generates a certain amount of feedback (since users preselect the information they wish to receive), but not to the extent of that which is generated by a 'pull' system (whereby a user sends an SMS query for the information that interests him or her). Unfortunately, most AMISs using a 'pull' system do not use it as a support tool to improve their activities (sometimes the AMISs do not even have access to the data concerning queries, as these data remain with the phone provider). However, it should be noted that it is possible to generate feedback without having to rely on sophisticated technology: a radio broadcast can be just as effective, as long as it invites listeners to phone in and gives them the time to do so (see the box below on the Soko Hewani radio program in Kenya).

Radio broadcasting should not be overlooked

Over the last few years, a growing number of AMISs have started using mobile phone networks (SMS messaging and IVR Voice Recognition systems) as a means of disseminating information (relying on this as an exclusive means of communication, or as an addition to radio broadcasts). Nowadays, we have enough experience to be able to assess the advantages and the shortcomings of using mobile phone networks. A major advantage of using mobile phone networks is that they generate feedback that helps identify user needs (such as when a 'pull' system is used, whereby the user sends an SMS query for the information that interests him/her--see the previous paragraph). The main drawback of using mobile phones is that in general, the amount of information that is disseminated is considerably limited compared to that which is disseminated through radio broadcasting.

In the first place, the number of people likely to receive information sent to mobile phones is significantly lower than the number of people likely to pick it up on the radio (10 times fewer people in Kenya and 100 times fewer in Zambia). A greater issue of concern is that those who do not have access to information disseminated through SMS messaging are also likely to be the most poor, and are either unable to use a mobile phone, or live in an isolated area (not covered by mobile phone networks), or only have small quantities to sell and are therefore reluctant to pay for the cost of an SMS message. The objective of AMISs to correct the asymmetry of information (in

order to strengthen the negotiating power of the weakest), may therefore go by the wayside. These problems may be partly overcome through training and education, and will probably be solved in the long term under the effect of a generational shift.

In the second place, for most users the amount of information received by SMS or IVR is much less than that received through radio broadcasting, particularly when information is disseminated through a 'pull' system (available data show users only send a few queries a year). Certainly, mobile phone dissemination allows market participants to access the information they need when they need it. The role of AMISs, however, ought to extend beyond fulfilling the information needs of which market participants are already aware. Regular dissemination of information on various products and markets (through radio broadcasting, billboards or 'push' system SMS messaging) enables market participants to discover new opportunities and to learn how the market works. This function as a tool for 'learning how the market works' can also be achieved with interactive radio programs (see the box below on the Soko Hewani radio program).

For all these reasons, it seems advisable to combine traditional means of dissemination such as the radio with new technologies such as SMS messaging and IVR.

Soko Hewani, an interactive radio program on the agricultural market situation in Kenya

Soko Hewani (which means "supermarket on the airwaves" in Swahili) is a weekly radio program on the agricultural market situation. This program used to be broadcast on radio West FM in the Western region of Kenya and lasted 30 minutes (as opposed to the usual 3 minutes for typical AMIS radio programs). This longer length of time meant a greater diversity of information (extending beyond market prices to buying and selling bids) could be disseminated and listeners could phone in with their questions. This program quickly became very popular (the most listened to program on West FM). Since April 2011, Soko Hewani is no longer broadcast on West FM but rather on national radio (KBC). It is still broadcast once a week but, for cost reasons, the program has been shortened and now only lasts 15 minutes instead of 30 minutes.

Linking AMISs with other market tools (Warehouse Receipt Systems, Commodity Exchanges)

The information disseminated by AMISs is useful only if it points to opportunities for carrying out transactions. Since the information that is disseminated generally focuses only on average prices per product by locality, however, it is often insufficient to induce trade. In addition to the potential problems in the methodology used to collect and process data, the difference in prices from one locality to another may be misleading if, for instance, prices do not refer to similar quality products or if the volumes traded in a specific area are low. A market participant may be reluctant to buy or sell from traders he does not know if he is worried that they may not fulfill their commitments. Therefore AMISs are far more widely used when product quality is clearly determined (quality standards), when inventories are guaranteed (warehouse receipt systems) and when systems have been put in place aimed at guaranteeing that commitments are met and that commercial disputes are settled (arbitration mechanisms or compensation boards). This is the case when commodity exchanges have been set up (for instance

the Ethiopian Commodity Exchange receives tens of thousands of SMS and IVR queries every day).

Similarly, AMISs are very often a prerequisite for the development of these market tools (warehouse receipt systems, commodity exchanges, etc.). For example, one of the main advantages of warehouse receipt systems is that they facilitate access to credit, the warehouse receipt acting as a guarantee for banks and microcredit institutions. However, in order to grant loans, banks need to be able to evaluate the value of the inventory, which requires the existence of reference prices, something only AMISs can offer. Thus, the existence of AMISs can help facilitate the development of warehouse receipt systems.

Achieving this objective requires fine-tuning the synergies between AMISs and other market tools. Where warehouse receipt systems and commodity exchanges already exist, AMISs must at the very least disseminate information on prices based on the different grades and standards that are used by these market tools. A more ambitious approach consists of developing AMISs and other market tools simultaneously (see the box below on the *Eastern Africa Grain Council* experience).

The *Eastern Africa Grain Council*, an integrated approach to market modernization

The *Eastern Africa Grain Council* (EAGC) is a regional interprofessional organization that brings together the different actors in the East African cereals sector (farmers, traders and manufacturers). EAGC has developed an integrated approach aimed at market modernization based on: i) the creation of a regional AMIS – the Regional Agriculture Trade Intelligence Network – which disseminates information on a daily basis from 40 wholesale markets in four different countries (Rwanda, Uganda, Tanzania and Kenya), ii) the development of warehouse receipt systems, iii) the development of e-trading, iv) the creation of regional agricultural commodity fairs, v) the diffusion within COMESA of quality standards for basic food products developed by the East African Community; and vi) support for the development of an alternative system to the courts for resolving commercial disputes. EAGC is currently planning to develop an e-trading platform for over-the-counter transactions of warehouse receipts

4. Improving AMISs and making them sustainable

In order to perform their mission better in terms of improving agricultural policies and market performance, AMISs must rethink the way in which they are organized (institutional homes, funding and networking).

Positioning AMISs in a favorable environment

First-generation AMISs were in most cases based within a public structure (marketing boards, Ministry of Agriculture, etc.). Later on, the institutional "homes" of AMISs became strongly diversified: nowadays a number of AMISs are run by professional organizations (interprofessional organizations, chambers of commerce, chambers of agriculture), farmers' organizations or private companies. These different types of structures and their positioning each have their own advantages and disadvantages. The best option depends on local context, bearing in mind that the objective is to promote the autonomy and the neutrality of AMISs. Autonomy is essential for guaranteeing the flexibility and the adaptability of

AMISs, whereas neutrality is essential for guaranteeing the reliability and the credibility of the information. In certain cases, the independence and reliability of AMISs could be threatened if they are tied to vested interests (for example if an AMIS is housed within a farmers' organization). On the other hand, as mentioned previously, basing AMISs within professional organizations may make it easier for them to take into account the needs of private-sector actors. Furthermore, this could help strengthen the capacity of these actors to lobby for their own interests when public policies are being developed.

Evaluating the impact of AMISs

Recently, a number of studies were carried out in order to evaluate the impact of AMISs on the behavior and income of farmers (Svenson and Yanagizawa, 2009; Fafchamps and Minten, 2012 ; Subervie and Galtier, 2012). These studies involved wide-scale surveys and sophisticated econometric analyses in order to isolate the effect of AMISs from other factors likely to influence the marketing performance of farmers. It is very tempting for funding agencies to use this kind of study for deciding whether or not they are going to fund a given AMIS. Therefore, it is important to point out the shortcomings of this type of impact study. For methodological reasons, these studies cannot be applied to all AMISs in all contexts (Staatz and al. 2012). When they are, they do not analyze the impact of AMISs on public policies, and they only provide a very limited analysis of this impact on market transparency (impact on a limited range of market participants, within a limited number of regions, and based on limited performance criteria—see Subervie and Galtier, 2012). It seems preferable to use these impact studies as a support tool for helping AMISs better understand the impact of the information they disseminate, rather than as a prerequisite for funding. This implies focusing impact studies on the understanding of the causal chain by which AMISs affect individual behavior rather than using them to evaluate additional price increases and added income for certain categories of market participants.

Guaranteeing the financial sustainability of AMISs

A majority of AMISs heavily rely on funding from donors. This type of project-based funding (limited to a few years) does not guarantee the financial sustainability funding of AMISs. Nowadays, some AMISs are state-funded, but very often this type of funding is insufficient. In addition, a number of AMISs generate income by selling information and other types of services (such as studies). However, the income generated through sale of information and other types of services currently represents a very minor source of funding for AMISs (even for those that are run by private companies).

The solution seems to lie in combining different sources of funding. State funding and participation of donors is justified by the dual public service mission of AMISs: shaping public policies and improving market transparency by providing information to the greatest number of market participants. The public funding can be complemented by the sale of more specific information to users and the development of other types of revenue-generating commercial services (such as brokering).

Promoting networks and experience-sharing

A wealth of experience has been gained through the diversity of AMIS approaches in Africa. Experience-sharing among AMISs needs to be developed, which could be achieved by linking AMISs together through a network (as demonstrated by the experiences of the *Market Information Organization of the Americas and the West Africa Network of Market Information Systems--RESIMAO*). Doing so might help solve problems related to the methods used for collecting data and ensuring data quality and ensuring its reliability. It might be interesting to work on a charter or a set of guidelines of Best Practices for AMISs. Another very important objective is to build a stronger relationship with funding agencies and ICT providers. Organizing an African AMIS Trade Fair could be one way of doing this. Finally, the increasing importance of regional markets and regional policies (for example, ECOWAP, the Common Agricultural Policy of ECOWAS) calls for developing more information-sharing among AMISs.

References

David-Benz, H., Egg, J., Galtier, F., Rakotoson, J., Shen, Y., Kizoto, A. (2012), Les SIM agricoles en Afrique sub-saharienne, de la première à la deuxième génération. CIRAD, INRA, AFD, CTA, 89 p. + annexes.

Fafchamps, M. & Minten, B. (2012), Impact of SMS-Based Agricultural Information on Indian Farmers, *World Bank Economic Review* forthcoming.

Galtier, F. & Egg, G. (2003), Le « paradoxe » des systèmes d'information de marché (SIM) : une clé de lecture issue de l'économie institutionnelle et de la théorie de la communication, *Economies et Sociétés*, série F, n°41, « développement », V, 7-8/2003, pp 1227-1260.

Kizito, A. (2011), The Structure, Conduct, and Performance of Agricultural Market Information Systems in Africa. PhD Dissertation, Michigan State University.

Staatz, J., Kizito, A., Weber, M., & Dembele, N. (2012), Challenges in Measuring the Impact of Market Information Systems, *Cahiers Agricultures*, forthcoming.

Subervie, J. & Galtier, F. (2012), Systèmes d'Information de 2ème Génération en Afrique Sub-saharienne : Etudes d'impacts. CIRAD, INRA, AFD, CTA, 76 p.

Svensson, J. & Yanagizawa, D. (2009), Getting Prices Right: The Impact of the Market Information Service in Uganda, *Journal of the European Economic Association* **7**(2-3), 435-445.

April 2012

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