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Case Study E-TIC.net: Use of Technology by Farmers in West Africa

Submitted by ICVolunteers

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The E-TIC project aims at providing training tools and elements so that small **farmers, herders** and **fishermen** may sell their products better. Through the setting up of the Internet portal www.e-tic.net and of a series of training sessions destined for local intermediaries (**young people, women, community radio journalists**), the E-TIC project aims at sharing knowledge relevant for effective farm management.

The E-TIC project is an initiative involving various role-players coordinated by ICVolunteers, a non-profit organization. It has been implemented in Senegal and in Mali (Sahel region), with the support of the *Fonds Francophone des Inforoutes* and a series of other partners. The setting up of a network in the agricultural domain is also an underlying objective of the project. The intermediaries in the field play the multidisciplinary role of connectors that provide a link between small farmers and new technologies.

An extensive enquiry and case study provide information about the effective use of technologies in rural areas of West Africa (Mali and Senegal). By far, community radio and mobile phone technologies are the two means that are most effective to get messages to local populations. Given that an important percentage of the population is illiterate and/or speaks a language other than French, which is taught at school, pictograms and other visuals provide the right alternative to communication.

The work is structured according to seven points: 1) a **survey** with the help of **questionnaires**; 2) (audio and/or filmed) **interviews**, as well as exchanges by interest groups; 3) a **study** in order to place the work in a **methodological and theoretical framework**; 4) organization of **meetings** with interest groups; 5) organization of **training seminars**; 6) setting up of **collaborations** with the authorities of the two respective countries; and 7) setting up **strategic partnerships** for the SMS messaging service and the research work, which accompanies the actions in the field.

Although the project is still underway, some **observations can already be outlined** concerning the use of new technologies in the domains of agriculture, stockbreeding, and fishing in Senegal and in Mali. The exchange meetings, the first training sessions, and the field survey in connection with farmers, herders and fishermen confirm that a large majority of people in these sectors today own mobile phones. Also, Internet access is available in some remote localities and community radio journalists use the Internet as an important source of information for their programmes. Overall, farmers do not appear to be advised enough of the often dramatic consequences of conventional agricultural practices such as the use of too much fertilizer and/or pesticides. Too much of the above eventually generates soil impoverishment and a decrease in the harvests. Information concerning market prices is very useful for small farmers and breeders who often do not have the possibility of knowing the current prices of their products.



The E-TIC project focuses on the use and utility of information and communication technologies (ICTs) in the domains of agriculture, stockbreeding and fishing. Its work has shown that ICTs are only a means, but one that can empower people if used in such a way that they can help themselves. Finding the right tool needs to take into consideration the local situation and context, for example, the fact that the adult literacy rate (age 15 and above) is just 26.2 per cent for Mali and 41.9 for Senegal.¹

Apart from the farmers, herders and fishermen themselves, other stakeholders in this project include universities for data collection; community radio journalists for the dissemination of information, be it through community radio, written press or television; mobile phone operators; volunteers; government; local authorities; and NGOs, all of whom cooperate in sharing information relevant to the project.

Through the network of local professionals and volunteers, ICVolunteers carried out a field study in six regions of both Senegal and Mali. In Senegal, this involved the localities of Guédé-Chantier (Saint-Louis Region), Meckhé (Thiès Region), and Mbam (Fatick Region), and in Mali, the Timbuktu, Ségou and Sikasso Regions. In each case, particular focus was given to the role of ICTs for agriculture, stockbreeding and fishing.

ICVolunteers were interested in finding out what kind of issues farmers, herders and fishermen had, what was the role of technology, and what could technology do to address future issues such as information to obtain comparative market prices, information about sanitation, organic farming practices, health issues for plants, animal and humans, etc. The information was collected by means of a standardized questionnaire distributed to local connectors (governmental representatives, community leaders, volunteers deployed in the six above-mentioned localities, journalists). A second questionnaire was specifically developed for journalists. The questions asked related to the main activities of the respondents, products and markets, the ownership of cultivated lands, products used on the lands and the selling of product information and communication. Given that the majority of people interviewed from the first group were not fluent in written French, the questionnaire was filled out by connectors (field volunteers). These volunteers were deployed in six main localities. For Senegal, it was Guédé-Chantier in Podor, Méckhé in Tivaouane and Mbam in the Fatick Region. For Mali, the field connectors-volunteers worked in the Timbuktu, Segou and Sikasso regions.

A series of training sessions were organized, in particular, for local intermediaries (young people, women, community journalists). The training sessions included ICT training that focused on the use of the Internet for reference and research purposes, the use of mobile phones for sending and receiving SMS messages, as well as the dissemination of information through networks.

¹ UNDP, Country profile of human development indicators, <http://hdrstats.undp.org/en/countries/profiles/MLI.html> and <http://hdrstats.undp.org/en/countries/profiles/SEN.html>, consulted on April 11, 2011.

Objectives of the E-TIC.net project

General objectives

- To acquire sound knowledge of the farming sector and to understand the issues associated with it;
- To be in a position to extract relevant information for the distribution of information on the field (notably the use of information and communication technologies, or more precisely the web and mobile phone);
- To appropriate the methodological tools allowing for the analysis of problems of distribution and logistics of agricultural markets and of their functioning;
- To understand the organization and functioning of various distribution circuits for agricultural production;
- To get to know modern logistics methods in order to be capable of managing the flows and information;
- To appropriate tools adapted for the collection and gathering of data on the field.

Specific objectives

- To formulate projects in order to improve the conditions of pastoral and urban agriculture and its profit;
- To launch initiatives to ensure and diversify the diet and well-being of economically-weak populations in an accessible way;
- To integrate the notion of sustainable development through waste management;
- To make populations aware of health risks;
- To promote likely policies, technologies and work methods;
- To improve productivity, accessibility and the support of rural production systems. The productivity, accessibility and support of these production systems must take into account the economic profitability, the support of service, supervision and evaluation services, the participation and the appropriation of the activities developed by the producers, access and the institutional context.

With regards to the specific communication tools put in place for this project, one of the first was the E-TIC.net website, to be translated into multiple languages – French, English, Wolof, Fulani and Bambara, as well as a number of other work and exchange tools (wiki, distribution list, etc.) for communication between project stakeholders. The Internet platform aims to provide information regarding agricultural activities, including production, marketing and promotion techniques, market prices and other useful data, both for the farmers themselves and other stakeholders, including researchers in this domain.

As far as the use of mobile phones is concerned, research has been carried out through partnerships with mobile phone operators such as Manobi, Jokko and Trade at Hand, that can provide technical solutions to facilitate the use of mobile phones for the collection and sharing of information in order to improve the economic, financial and commercial transactions of the populations in their activities of agriculture, stockbreeding and fishing. Manobi has developed a range of mobile and web-based applications focused on improving weaknesses in value chains. T2M enables farmers to check market prices on their mobile phones via SMS, WAP, MMS, or mobile Internet—all of which are designed for low literacy. The information is updated by a team of market researchers who map and enter it into their mobile phones.

There has been a significant increase in the use of mobile phones amongst populations in Africa, as is also the case with community radio stations, another popular means of communication, especially as it does not require the users to read or write information, which is provided in the local language understood by all.

An AgriGuide is currently under development. It aims to provide all the information collected in a simple way, accessible in local languages and communicated through illustrations and simple explanations in the local languages. This guide aims to serve as a work tool and a reference document creating a link between information and communication technologies, agriculture, stockbreeding and fishing in Senegal and in Mali.



Highlights

Throughout the project, various actors were involved in seminars and meetings, coming from both Senegal and Mali, who work in the domain of rural, urban and peri-urban agriculture. For example, in Senegal, meetings took place at the Ministry of Stockbreeding of Senegal, the National Civic Service of Senegal, as well as a large communal meeting in the presence of numerous mayors of communes and villages, which were later broadcast on the RTS television channel. In Mali, a hearing took place with the Secretary-General of the Ministry of Youth and Sports of Mali and workshops took place in February 2010 in the presence of various authorities, including the Mayor of Bamako and representatives of the Ministry of Stockbreeding, Agriculture and New Information and Communication Technologies.

Several interviews were carried out with various authorities and stakeholders, including mayors, representatives of associations, farmers, herders and fishermen, in both Senegal and Mali and were recorded on film and documented.

Results

Information gathered so far through the field study indicates that both mobile phones and community radio are the best adapted means of communication currently available. Where accessible, the Internet also constitutes a significant source of information. However, while many cybercafés have sprung up in cities over the last decade, the use of the Internet in rural areas of Senegal and Mali still remains marginal. This may evolve over the next few years, with the mobile



web developing new and adapted applications (such as information about the weather, markets and animal health transmitted through a mobile phone). When ICVolunteers first started its work in Timbuktu in 2002, there was one cybercafé available, but no mobile phone coverage. Today, many of the herders out in the desert use phones and solar panels to recharge them.

A survey carried out by means of a standardized questionnaire revealed that the main activities of the

respondents are: agriculture (46.5 per cent), stockbreeding (42.6 per cent) and river fishing (14 per cent). Responses were obtained from 132 different families of farmers, herders and fishermen in Guédé-Chantier, Méckhé and Mbam (Senegal) and Timbuktu, Segou and Sikasso (Mali).

The majority of people interviewed sell their products in the local market or neighbouring villages. Of all the products sold, 28.6 per cent of the respondents sell directly to the consumer, as compared to 46.4 per cent who deal with intermediaries, and 25 per cent who do both. While the vast majority of traders get most of their information from direct discussion with other traders, many of them indicate that they also use mobile phones to share information obtained. Traders see a use in SMS services and mobile payment applications.

Of the people surveyed, 52.4 per cent said that they determine the price of at least one of their products, while 40.3 per cent of the respondents said that they work with intermediaries who determine the prices, and 12.1 per cent indicated that they refer to a cooperative or association. Ten point four per cent declared that they apply the prices proposed by fish wholesalers, or factory – or government-centralized entities such as SAED² in Northern Senegal.

Respondents point out that it would be useful to obtain weather information, market prices, animal health-related information and practical tutorials for farming.

In Senegal, approximately 70 per cent of the working population are involved in agriculture (including forestry, stockbreeding and fishing). The following languages are spoken by the population in Senegal: French (official), Balanta-Ganja, Hassaniyya, Jola-Fonyi, Mandinka, Mandjak, Mankanya, Noon, Pulaar, Serer-Sine, Soninke and Wolof. The average literacy rate in the country is 39.3 per cent (51.1 per cent for men and 29.2 per cent for women).

² Société Nationale d'Aménagement et d'Exploitation des Terres du Delta du Fleuve Sénégal

Even though Guédé-Chantier has been a member of a network of eco-villages in Senegal since 2007, the agricultural practices are mainly conventional, with the widespread use of fertilizers and pesticides. Farmers in the region do not have sufficient knowledge of organic farming practices. Often farmers sell their products and foodstuffs such as tomatoes and rice at lower prices than what could be obtained if the farmers had more complete and accurate information regarding the markets. “Sometimes we feel our village is isolated,” points out a local farmer. “We have problems selling our products. Speculation forces us to sell at very low prices.” Herders generally sell their animals on the local market, as is the case with the river fish sold by fishermen. Eighty per cent of the inhabitants of Guédé-Chantier are farmers and twenty per cent are fishermen, traders or municipal employees.



Background Information

The mobile phone is the most common means of communication; however, it is thought that the setting up of a community radio station would be very useful. There is one Internet connection in an Internet café which is not widely used. A new computer training centre was set up by EREV, a non-profit organization. The centre is managed by a local management association and is equipped with 30 computers.

As far as Meckhé is concerned, agriculture also plays an important role, with the main crops cultivated being groundnuts and cassava, mainly due to the fact that these crops do not require an enormous quantity of water, especially as the village only gets three months of annual rain. As in Guédé-Chantier, the agricultural practices are traditional. The lands have become impoverished due to overexploitation and the use of pesticides and chemical fertilizers. Many of the farmers know that pesticides are not good for their soil. They notice that each year they have to add more and more



chemicals. Thus, alternative solutions would be most welcome, but many of the farmers do not possess the required knowledge to implement change. Sharing of agricultural best practices, is thus, important for the preservation of the environment and natural habitat. Information and communication technologies can play an important role in this information sharing. An information technology training centre has been set up in the village as well as a private Internet café, but further efforts are needed to make these tools accessible to the population.

In Mbam, the groundnut represents the most widely cultivated crop despite how difficult it is to distribute. Millet is also cultivated; however, both crops are mainly cultivated for the direct use of the inhabitants themselves and only a part of the harvests is sold. Market gardening also represents an important part of the agriculture of this region. Farmers tend to use chemical fertilizers which lead to land impoverishment. Stockbreeding is also an important activity in the region; however, herders are faced with problems of animal diseases. This is partly due to the animals not being vaccinated often enough and not receiving vitamins or de-worming treatments. The most present communication tool is the mobile phone, largely used for SMS communication, much more so than for actual phone calls. As Mr Sarr, the local representative of the global Eco-Village Network (GEN) in Mbam points out, "If it is to talk to my neighbour, why waste credits on my phone? But if I have customers that are living outside the village, I may call them to let them know that my crops are ready to be sold."

With regards to Mali's economy, agriculture and stockbreeding represent essential sectors in the country. However, only the southern part of Mali is favourable for agriculture and less than 2 per cent of the country's surface area is cultivated. Mali is faced with the environmental problems of drought, deforestation, soil erosion, desertification and an insufficient supply of drinking water. The languages spoken by the population of Mali are: French (official), Bambara (Bamanankan), Bomu, Hassaniya Arabic, Maasina Fulfulde, Mamara Senoufo, Kita Maninkakan, Koyraboro Senni Songhay, Pulaard, Songo, Soninke, Syenara Senoufo, Tamasheq, Tieyaxo Bozo, Toro So Dogon and Xaasongaxango.

In the Timbuktu Region of Mali, wheat and rice (irrigated with Niger River water) are the main crops cultivated, and stockbreeding represents an important activity with almost 60 per cent of the population involved in it. The types of stockbreeding practised are transhumant, nomadic and sedentary stockbreeding. Animals are sold at the Timbuktu market, bought by merchants who then sell them further in the large animal markets held in Mauritania and Algeria. Speculation is an issue here, where local herders are paid a fraction of what animals are sold further down in the value chain. Therefore, for herders who wish to sell their animals, it would be useful to be able to obtain information in advance regarding the prices, so as to receive an equitable price at the outset. Especially as many of the herders are illiterate, the most useful means of communication for them, in this sense, would be the community radio. There is a community radio station, "Radio Boctou" as well as a regional radio and national television network. Mobile phones are also widely used and there are several points of Internet access in Timbuktu.



In the Segou Region of Mali, the population is largely made up of nomads and semi-indigenous and indigenous peoples. Segou was found to produce the largest proportion of foodstuffs in Mali. Cereals, including millet and wheat, vegetables and tubers (potatoes, sweet potatoes) are cultivated here. It was found that farmers, herders and fishermen are all in need of training in new techniques and methods in order to increase the profitability of their production. As far as communication is concerned, there is a number of Internet cafés in the region.

Significant agricultural activity takes place in the Sikasso region of Mali. It acts as a crossroads between the coastal countries (Togo, Benin, Ghana, Côte d'Ivoire) and the coastlines of Mali and Burkina Faso.

From a communication point of view, Wolof is the most commonly represented language among the targeted populations of Senegal, as is Bambara for the targeted populations of Mali. To reach these populations it is important to find means of using these languages, both on a local level, through the use of community radio stations and mobile phones and on a more global level, through the translations of the E-TIC website and Internet platform.

Mobile phones in West Africa

- In 2009, the estimated population of Senegal was 13.7 million inhabitants.³ The number of mobile phone subscriptions (for the most part prepaid cards) was 5.4 million in 2008. This means that one out of every 2.5 inhabitants approximately has a mobile phone. In a context where 42.2 per cent of the population is under 15 years, this ratio is doubled for people over 20 years.
- For Mali, this ratio is slightly lower, but remains significant. For a population estimated at 13.4 million inhabitants (2009), 3.4 million mobile phone subscriptions were counted (including prepaid cards). This means that approximately one out of every four inhabitants have a mobile phone. With 48.3 per cent of the population under 15 years, the use of mobile phones for those over 20 years is almost 50 per cent of the population.
- In Mali, there are 168 radio stations including 121 community and associative radio stations, 38 commercial radio stations and denominational radio stations (figures from the *Union des Radios et télévisions libres du Mali* – URTEL). The complete list of independent radio stations in Mali is available as an appendix of the present report.

Project at a glance

Location: Region of Timbuktu, Segou, Sikasso (Mali) and Region of Guede Chantier, Mbam Méckhé (Senegal).

Technology: Internet and mobile phone.

End users: Farmers, even if the groups remain an indispensable intermediary links to new technologies. You must press the field connectors.

Key to success: Working in groups and between groups.

Challenges: Limited access to technology today, the fact that the majority of the people concerned communicate orally with only very little writing. French-speaking context with partner languages (especially Wolof, Fulani, Bambara, Tamashek, Songhay).

³ Statistics of the ITU on the use of mobile phones: http://www.itu.int/ITU-D/icteye/Reporting/ShowReportFrame.aspx?ReportName=/WTI/CellularSubscribersPublic&ReportFormat=HTML4.0&RP_intYear=2008&RP_intLanguageID=1&RP_bitLiveData=False,

Conclusion

As shown by the case studies and the survey, ICTs have an important role to play for the populations in Senegal and Mali, but the specific applications need to be adapted to local needs and means, for example, low literacy and local languages. Given the relatively low literacy rate in most cases and a strong oral tradition with the use of local languages, the most common means of communication remains direct conversation (whether through farmers, herders, etc. meeting each other or speaking with each other by mobile phone) and community radio stations. Especially with regard to farmers, herders and fishermen being able to buy and sell products more effectively and at a better profit, the use of SMS messaging services and the Internet could be of considerable use to them. Nevertheless, the Internet is not widely used.

However, with the development of tools such as the E-TIC.net website and the “Réseau VERT” platform, and with adequate training provided, it is hoped that this technological tool will become more accessible to the local populations involved in farming, stockbreeding and fishing, especially as the information is provided in the local languages, as well as French and English. The training sessions for local intermediaries (young people, women, community radio journalists) have, therefore, been a useful step in this approach. The use of mobile phones, and in particular, SMS messaging services has been examined and encouraged through partnerships with various mobile phone operators active in both countries. As a considerable number of people own a mobile phone, it is worthwhile for them to learn how to use them for the purpose of enhancing their economic and commercial activity.

Other projects of ICVolunteers

Other projects in which ICVolunteers is involved include:

GreenVoice: This project aims to increase awareness of environmental issues through the collection and display of photos from throughout the world. In 2011, following the third call for creative photography issued by ICVolunteers, a photographic exhibition on the topic of “Water and Forest, Citizenship and Volunteering” will be organized at Quai Wilson in the heart of Geneva. For more information, see <http://www.icvolunteers.org> and <http://www.greenvoice.info>.

MigraLingua: This project aims to provide a service of linguistic accompaniment to migrants who do not master the local language. Volunteer community interpreters are deployed, in order to assist migrants in their daily tasks in areas such as education, health and administration. The programme is aimed at migrants (whether families or individuals), interpreters and institutions. For more information, see <http://www.migralingua.org>.



Maaya: ICVolunteers is a founding member of Maaya, the World Network for Linguistic Diversity, the aim of which is to enhance and promote linguistic diversity in the world, through the empowerment of language communities worldwide in developing and using their own languages, through the promotion of bilingual/multilingual education, localized software, equal access to all languages in cyberspace, and through its contribution to the creation and sharing of language resources. For more information, see <http://www.maaya.org>.