



Shortwave radio and internet are used to communicate between the rural Fabema villages and with the capital Bamako.

Improving rural livelihoods through access to knowledge

Information and communication technologies in support of the agriculture sector in Mali

Since obtaining independence from France in 1960, the people of Mali have had to contend with rebellions, droughts, one coup, and twenty-three years of military dictatorship. This combined with widespread poverty, high illiteracy levels, and a low life expectancy, has made Mali one of the least developed countries in the world.

Yet, despite these hardships, Mali has seen some positive developments in the last decade: a democratically-elected civilian government committed to decentralisation and a steady economic growth. The International Institute for Communication and Development (IICD) is working in Mali to support developments in the agriculture sector by use of information and communication technology (ICT) tools. Mali is among the poorest countries in the world, with a highly unequal distribution of income. Nearly 75% of the 12 million population is rural, about 10% is nomadic, and 72% of the people are living of less than 2 US\$ per day.

The rural population makes up for Mali's poorest

people, with the poorest living conditions (nutrition, education and health) and potential (access to land, equipment, credit and employment). Among the factors that contribute to rural poverty are inadequate and costly basic social services, rural isolation, the cost of energy and a weak information and communication network.

The county's natural resources consist of amongst others gold, phosphates, kaolin, salt, limestone, uranium and major hydropower potential, but their distribution is uneven and they are not used to full advantage or managed effectively.

Landlocked and with 65% of its land area desert or semi-desert, the Niger River functions as the main trading

and transport artery in the country.

Mali's economy is overwhelmingly agricultural; 80% of the labour force is engaged in subsistence agriculture and fishing. The main agriculture produce are cotton, millet, rice, corn, vegetables, fruits and peanuts. The main export products are cotton and gold, making the country quite vulnerable to fluctuations in the world prices for these commodities.

Development of the rural sector has been limited by a harsh climate, periodic droughts and low levels of technology. Industry focuses largely on food processing for domestic use, but the government actively stimulates development of commercial products.

One of the fastest growing industries is the fruit industry, although it is still relatively small compared to rice and corn. Most of the fruit, especially mango, is exported to neighbouring countries. Potential buyers in other regions, such as Europe, also seem to have an interest, especially in mangos and derived products as dried mangos, mango pulp etc. But so far Malian producers have failed to enter the European market on a larger scale. This is a great loss as exports to Europe could be highly lucrative.

A role to play for information and communication technologies

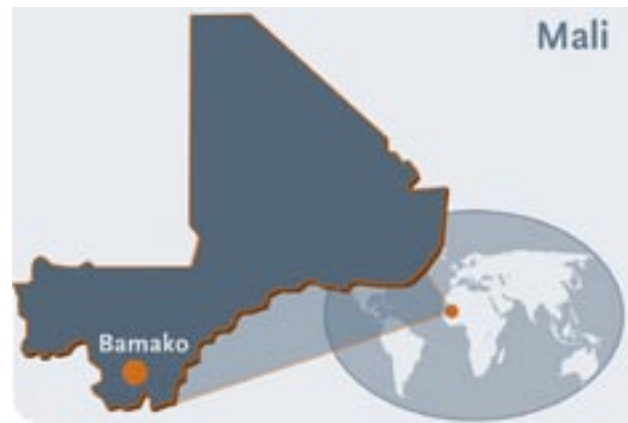
Lack of infrastructure, low institutional capacity, low levels of private foreign investments and huge geographical distances have had a negative impact on the blossoming of a nation wide initiative in this field. Since there was hardly an information infrastructure in place before, successful ICT implementation can have an enormous impact, but it remains quite challenging to achieve results.

Mali has a National ICT Strategy which sets the broad framework and priorities to be followed in the development of ICT initiatives. But more sector-oriented ICT policies targeting agricultural development for instance still need to be developed.

The country is experiencing a huge increase in the penetration of mobile phones, compared to which the increase of computers and Internet use remains much lower. ICT penetration in general has increased especially in urban areas, while huge portions of the countryside remain largely underdeveloped and even continue to lack mobile phone coverage.

The challenges and the tools: the IICD Mali Country Programme

The agriculture sector in Mali has great growth potential, however, is being held back by lack of infrastructure and relevant information for the producers and processors of agricultural produce. Information and communication technologies have proven to be appropriate tools for enabling better access to markets, market price information and information on production methods, which can have a positive effect on the livelihoods of the people depending on this sector.



The IICD Country Programme in Mali, besides projects in the health sector, includes five agriculture projects.

Jèkafo Gèlèkan: rural information system for farmers in Sikasso region

Rural people often lack access to tools that enable them to get answers on questions concerning laws and regulations, projects and programmes, technological developments, production trends, other producers' experiences, etc. The Regional Committee for Consultation of Rural People (CRCR) is via its local committees working to bridge this information gap, as well as supporting producers' participation in the formulation and implementation of rural development policy at regional and national levels.

CRCR in Sikasso initiated the project called Jèkafo Gèlèkan, meaning "let's talk under the palaver tree". The aim is to improve communication and information exchange between farmers' organisations in the Sikasso province and the regional and national authorities, thus contributing to raise the farmer's voice in the political debate around agriculture.

Local Committees for Consultation of Farmers' Organisations (CLCOPs) in seven towns and villages form the anchor points for a communication system for the farmers' organisations affiliated to CRCR – counting 215 organisations (of which 115 are women's organisations), and catering for over a million beneficiaries (51% female).

The project is using computers and the Internet to improve information streams to and from the CLCOPs, and local radio to disseminate specific information on a large scale. By using ICT, rural dwellers – both producers and processors – can learn about opportunities for improving their economic situation.

Specific objectives are:

- To improve the information system linking producers
- To give producers real-time access to relevant information
- To strengthen cooperation and trust among producers
- To facilitate the flow of information between the CRCR and CLCOPs and among the organisations themselves
- To establish annual sessions for discussion among producers
- To facilitate cooperation between the different stakeholders

Kari&TIC: ICT for shea butter producers

This project arose from the partnership formed between the Zantiébougou Women Shea Butter Producers Cooperative (Coprokazan) and the Malian Association for the Promotion



Two women from Coprokazan record a field visit to see shea production in film and video.

of Youth (AMPJ). The organisations were seeking solutions to the problems encountered with marketing of shea butter. Shea butter is made from the fruits of the shea or karite tree and is widely used in cosmetics as a moisturizer and emollient.

The project aims to facilitate sales of shea butter at the national, regional and international levels. This initiative contributes to economic, social and political development, as with developing the market for Coprokazan's shea butter the livelihoods of its members will improve.

To improve promotion activities - in order to generate higher sales - the project set off to install lighting and computers, train women in the use of standard software and office automation tools, install e-mail, create a website, and advertise on radio and television.

The project was officially launched in Zantiébougou in January 2007. By the end of that year a group of 12 women was directly interacting with the ICT services of the project. Solar equipment was installed to supply electricity and ICT has been integrated in the organisation in the following ways:

- Computerised bookkeeping, using Excel.
- Website www.coprokazan.org and email: the site is regularly updated with information and the numerous messages and requests for shea products received from abroad (Canada, Latin America, etc.) are being answered by email.
- Database (Access) with member information and the quantities of shea butter the organisation produces.

Actively exploring new markets and supporting this work through the use of ICT will become more important when the capacities of women to use ICT are strengthened. The priority is now to make sure that women start using ICT to train the members on how to improve the quality of their shea butter, as to strengthen the "supply" side of the market.

In the surrounding villages, presentations are given to the women to show how they can improve the quality of their work. These presentations are animated by a variety of pictures showing good and bad production practices. The team also produced a short film on the project.

The most tangible result is the rise of the sales figures. If the trend continues, over 2008 Coprokazan will double its sales to 32 million FCFA (€ 48.000) compared to 16 million FCFA (€ 24.000) in 2006.

One of the forthcoming challenges may be how to increase the production of shea butter in order to be able to continue to respond to the growing market demand.

The Malian Ministry for the Advancement of Women announced in October 2008 to award Coprokazan with a prize for their achievements in producing shea butter. Coprokazan is seen as one of the best shea producing organisations in Mali. The organisation has already trained numerous other organisations in order to improve the quality and production, and also the use of ICT to better promote their produce has been recognised by the Ministry as a key outstanding success. The Ministry is going to

encourage more organisations in other parts of the country to start producing shea butter.

Qualité & Fruiléma: information system to increase exports of fruits and vegetables

One of the bottlenecks for mango producers and exporters is that fruits for the European markets need to meet very stringent criteria with regard to the origin of the product, the way it was grown, if and what fertilisers and pesticides were used, and how it was packaged. For importers it is important to be able to assess the quality and reliability of their exporting counterparts.

Until recently it was very difficult for Malian producers to collect and process this data as there is no information infrastructure or system in place to compile, register and make this information accessible. Hence certification and traceability, necessary for entering new markets, was hampered.

To provide information to all parties involved in the value chain the idea of a web-platform was launched. The project is implemented by Fruits et Légumes du Mali (Fruiléma), a Malian fruit and vegetable export organisation representing five fruit and vegetable export associations that in turn represent 790 small producers and 120 trackers/collectors. Through this project Fruiléma seeks to acquire the tools and resources needed to meet the strict requirements for exporting Malian farm products to international markets. One of the goals is to secure GLOBALGAP certification, a private sector body that sets voluntary standards for the certification of agricultural products around the globe. More specifically, the project involves setting up an information and communication system to identify producers, to geographically determine farm plots, and to introduce quantity and quality indicators for purposes of analysis and decision-making support. The gathered information is accessible via a web-enabled platform and can be updated via Internet and mobile phone.

The target groups are producers, exporters (the Fruiléma members) and fruit and vegetable importers, as well as research partners and the government departments concerned (agriculture, trade). The platform developed by the Senegalese partner Manobi, a mobile data services operator, was officially presented in February 2008.

The platform development involved identifying all processes in the production and conditioning of mango products, software development and capacity building of the five involved exporting organisations. These organisations started entering data in the database. This process is currently ongoing. Meanwhile, Manobi and the partners use the platform to convince importers in Europe to engage in business with them. As a result, they contracted two importers for the mango season 2008. Unfortunately, due to credit difficulties, the exporters were not able to comply with the quality demands of their European counterparts at that time.

Beyond improving the exporting capacity, effort is made

to speed up data entry in the database. Thereto capacity building on PDA (Personal Digital Assistant) use will be organised, which should make it easier for the exporters and producers to directly send the data from the field to the web-platform.

The activities developed should result in gaining reliable data, increasing productivity, enabling packaging centres to operate all year round by having a sufficient variety of products, compliance with the requirements of external markets, introduction of new farming techniques, product traceability for consumer reassurance, creation of a Malian label for gaining market recognition, and increasing the effectiveness and professionalism of Fruiléma and its members.

www.fruilema.com www.manobi.net

Rural information system for farmers in Mandé region

The Mandé region (south of Bamako) is one of the very poorly developed areas of the country. Infrastructure is virtually non-existent, and services for the population are scarce or have difficulties to reach their target groups. A vast majority of the people in this region live from farming.

The non-governmental organisation Association d'Aide et d'Appui aux Groupements (AAAG or 3AG) has been created in 1990, with the objective to capacitate and enhance farmers' organisations in the Mandé and Tiakadouyou regions. It currently works with 102 organisations in 35 villages, which are regrouped in Fabema (Fédération des Organisations de Base du Mandén). The main objective of 3AG is to empower Fabema to the level that it is able to sustain its activities itself.

One of the main obstacles Fabema faces is the lack of communication between its headquarters in Bancoumana and in Dangassa and the other villages it is supposed to cover, and between the headquarters and 3AG in Bamako. The current project, which started in December 2004, is intended to address this communication problem, using a combined system of shortwave radio (RAC, powered by solar systems) in five selected villages, and Internet at the level of 3AG in Bamako. Information can be sent from Bamako to the connected villages and the other way around, and between the villages themselves.

All five RAC-stations are operational, and the two headquarters of Fabema are also equipped with computer and photocopy equipment. A small group of users has been trained in the use of the RAC-equipment and in the basic use of ICT and multimedia.

3AG's equipment and capacity has been enhanced and its Internet connection has been improved. During the project period, the organisation has fully embedded ICT.

While the initial focus of the project was on market price information for farmers, it became clear that Fabema's main production is being sold on small local markets, between which the price differences are too small to make it interesting to transport perishable products to and from. And while the RAC system does fulfil a need for general



Processing mangos at Fruiléma.

communication and information sharing, it also became apparent that that in itself does not justify the investment.

During the next phase of the project the focus therefore broadened, including capacity building of trainers on the use of multimedia tools for increasing awareness raising on for instance health and alphabetisation issues. Extension workers from Fabema and 3AG started working together with the Communal Health Centres (CSComs) on vaccination, AIDS prevention and mother care campaigns, using digital photo camera's, video camera's and slideshow presentations to enhance the impact of these campaigns.

Initial objectives:

- Increase farmers' incomes via improved circulation of information on agricultural production techniques
- Facilitate farmers' access to national and international markets and enhance the commercialisation of their products
- Improve the speed of communication between 3AG and Fabema
- Improve communication and information streams between the five communities in which RACs are placed
- Cut down the number of necessary physical visits to the villages by the extension workers
- Enhance the production and the productivity of the beneficiaries
- Enforce the autonomy process of Fabema

Next to the existing objectives, two extra focus points were added for the second phase of the project:

- Strengthen health awareness campaigns in the region
- Enhance collaboration with 7 Communal Health Centres in the region

Sene Kunafoni Bulon

The Sene Kunafoni Bulon project is a good example of close collaboration between three large farmers' organisations in Sikasso (the Union of Mango Producers, the Federation of Potato Producers and the Federation of Women Mango Processors) and the regional branch of Mali's national Institute for Agricultural Research (IER) that focuses on the process chain of products like mangos, onions, potatoes, etc. In response to requests made by members of the farmers' organisations, IER looks up information on production and processing methods and passes it on to them. The project is improving the flow of information to and from IER and between farmers, using a combination of Internet, video, local radio and posters.

The specific project objectives are:

- Improve the flow of information within the coordinating office, between the coordinating office and the members, and between coordinating officer and other stakeholders in the field of processing and marketing of agricultural products.
- Improve the information flow within the potato producers, mango producers, and women mango processors organisations and between them and other parties involved in production, conservation and marketing of agricultural products.
- Improve the promotion of agricultural products by using market information.
- Better structuring of the mango and potato sectors.
- Improve research and structuring of information and develop a knowledge management strategy for production, storage,

- processing and marketing of agricultural products.
- Improve the dissemination of information on methods for improving the production, conservation and processing of agricultural products for better adoption by producers and processors.

The fact that the three involved farmers' organisations now have an office with ICT equipment has hugely contributed to the organizational development and visibility of these organisations.

During 2007, the centre in Sikasso has become a focal point for individual farmers, organisation members and agricultural extension organisations. The centre has improved the opportunities of the organisations to participate in agricultural fairs and to develop contacts with potential clients and supporting organisations.

The three farmers' organisations involved in the project have started to reflect upon strategies for sustainability and further cooperation with the project Jèkafo Gèlèkan of CRCR. The issue of long-term sustainability remains the main challenge to be tackled by the involved farmers' organisations: their members clearly see the added value of the project for the positioning and income improvement of the organisations, but will they be able and willing to support the running costs? While solutions like taxing on overall sales are being studied, partnering with other support organisations may be an intermediary solution.

Impact of the agriculture programme

The agriculture projects in the IICD Mali Country Programme have 380 direct users and approximately 585.000 beneficiaries. Impact of ICT-enabled projects usually starts becoming clear after about two years of implementation. The projects in the livelihoods sector in Mali started in 2007 – except for the Mandé region project – which makes it too early to formulate the real impact of the programme. It is generally seen however, that economic and sector impact increase over time, while awareness and empowerment often score the highest during the first years of implementation. The latter is in line with the analysis of the data gathered through the IICD Monitoring and Evaluation (M&E) system and the outcomes of the Focus Group meetings that have taken place.

Around 375 questionnaires have been collected and analysed since the start of the projects.

In general we see that the use of ICT improves visibility, social status and credibility of farmer organisations. The professionalisation of the work of farmer organisations makes it easier for them to involve in collaboration. It is possible to specifically design ICT tools aimed at facilitating relations with the actors in the rural economy.

Participants of the Focus Group meetings consider empowerment as the most important type of impact. To strengthen empowerment, not only training is mentioned as an important means, but also the exchange of information and experiences between actors is considered crucial.

Non-achievement of goals set for participation can be attributed to four major factors; duration of the project is considered short; lack of equipment (computer, copier); lack of connectivity; and lack of qualified personnel.

The main reason for users to participate in the projects was to improve communication and exchanges. But we notice that the initiation and enhancement of computer skills was the most appropriate.

Capacity building

All 380 users of the projects have received training. This was made possible by means of a train-the-trainer methodology, where a trained group in turn trains a new group of users. Training is an ongoing activity within the projects.

Three Bamako-based training partners are developing a customised capacity development programme to address local ICT training needs. Currently, the capacity development programme is focussing on training end-users to acquire basic ICT-skills. There is also a need for training in the use of multi-media and (for members of the national ICT for development network Togunet) e-facilitation skills for knowledge sharing. Recently 18 Coprakazan members received follow up training, this time in PowerPoint, Excel and Moviemaker. Qualité & Fruiléma will get training on the use of PDAs and data collection.

Further to the effects gained, the projects have already generated a number of very tangible results.

The Jèkafo Gèlèkan project continues to show a very high dynamism. The information system seems to have unleashed the potential of CRCR to inform, federate and stimulate the farmers' organizations in the province. Satisfaction with the project remains high.

The most tangible result of Kari&TIC is the rise of the sales figures. If the trend continues, over 2008 Coprokazan will double its sales to 32 million FCFA (€48.000) compared to 16 million FCFA (€24.000) in 2006.

While the Kari&TIC project only started implementation beginning 2007, the organisation is already widely known within the region due to the existence of a number of facilities that are very scarce in this region: electricity, Internet connection, computers etc. This led to an unforeseen impact on the community and the surrounding villages. Organisations, people and even local decision-makers are willing to travel sometimes more than 30 km to make use of the project services, like the computer to type documents, photocopy, and print documents. The training room and computers are also used for all kinds of trainings carried out by different organisations. Whereas in the evening pupils come to do their homework in the surroundings of the building, as this is one of the very few places in the village that has electric light.

During the first phase of Sene Kunafo Bulon, apart from empowerment, the project helped the three involved farmers' organizations to increase their visibility, to improve productivity and processing quantity and quality, to identify new markets, and to better negotiate bulk prices for their



A member of the Sene Kunafoni Bulon project.

products. The improved access to market prices has contributed to a more informed position of the mango producers in their negotiations with traders, resulting in a net increase of the kilo price for mangoes of 5 FCFA per kilo in 2007. On a total production of 6500 tonnes in 2007, the extra income has been 32,5 million FCFA (€48.500). It is to be seen whether the same result can be achieved in 2008, but it is an important indicator of direct empowerment of the producers via access to information.

Via the support of the project, numbers of individual processors in Sikasso have been able to participate in a small entrepreneur contest, funded by the Assemblée Regionale de Sikasso. Five of them received start-up funding of 2,5 million FCFA (€3750) per person.

The RACs have a positive influence on the communication and information flows in the Mandé region covered by Fabema. Important information on market opportunities, weather forecasts etc. now reaches a much larger audience.

The project's focus on enhancement of health campaigns via multimedia seems to be a big success - both in terms of collaboration with other service structures (CSCComs in this case) as in terms of impact on the beneficiaries - who indicate that they understand and memorize the issues far better when images are associated to the teachings.

Lessons learned

In Mali, there is a general lack of capacity. To achieve success the country programme needs to identify and work with good and trustworthy enabling partners.

Shared connectivity models are one solution to solve the lack of connectivity.

In general we see that users with a higher educational level show a higher level of satisfaction. Recognizing that our main users are people with low levels of formal education, the question 'what should be done to raise their level of satisfaction?' was discussed in the Focus Group. Some of the suggestions made: provide a keyboard and training materials in the local language Bamanan, adapt training to their practical level, make materials based on testimonials and images.

Farmers indicate feeling more at ease making use of an information centre run by farmers, like a CLCOP, than with making use of the services of a commercial telecentre.

Jèkafo Gèlèkan

Maintenance of the ICT equipment and connectivity in the CLCOPs remains a challenge. Budget and provide for continued training for the centre managers.

To get visitors to your website you will need to actively market the site. Ensure that structure, content and design of a website get sufficient attention.

Kari&TIC

The project team prefers to work with a relatively small group of women who can really learn and apply the ICT skills, instead of focusing on a large group of women who will be able to understand some of the basics, but will in the end not be able to apply it.

The presentations shown to the women, on how they can improve the quality of the shea butter, are animated with pictures showing good and bad practices. These visuals have positively influenced the uptake of the content and shown a direct improvement in production methods.

Qualité & Fruiléma

Improving an export chain is a very complex process. Developing a web-enabled database with all necessary information does not guarantee a successful chain. Other factors such as access to credit, physical infrastructure, skilled labour, and marketing are equally important. On the other hand; the existence of the platform strongly strengthened the credibility of the exporting partners and even led to concrete exporting contracts.

The data entry process is long and cumbersome and the partners sometimes prioritize other work areas. The link between the use of the platform and direct economic benefits should be emphasised over and over again. It is recommended to give access to the database to as many people as possible, although this conflicts with confidentiality issues.

Due to the complexity of the process, it is important to coach/guide the partners closely during implementation. The required capacities include technical expertise (how to translate existing procedures and processes in an information system), competencies in chain development (actors, procedures, market demands, laws/regulations etc.) and ICT capacity development (how to train who and when).

Working with the exporters does not guarantee improvements at the level of producers. It is important to involve the producers as much as possible in project implementation, awareness raising and capacity building.

In the extension phase, more attention should be paid to direct empowerment of the producers, by helping them to determine the exact geographical coordinates of their farm plots and to reduce their expenditures on pesticides and fertilizers. Awareness raising should help the producers to better establish their position vis-à-vis their buyers.

Sene Kunafoni Bulon

Long-term sustainability remains the main challenge to be tackled by the involved farmers' organisations: their members clearly see the added value of the project for the positioning and income improvement of the organisations,

but they may not be willing and/or able to support the running costs. While looking into solutions like taxing on overall sales, partnering with other support organisations may be an intermediary solution.

Rural information system Mandé region

The multimedia equipment used suffers from the extreme circumstances in rural settings. Regular maintenance and budget reserve should be in place for safekeeping.

The (paying) services the project offers to the general population will not be sufficient to cover the costs of maintaining the RAC-system. The project team should timely look for alternative ways of financing the operation after funding stops.

The information services are highly appreciated by the users, but to encourage people to really use the network more time needs to be invested in content development, collecting information and prioritising the information per sector. One of the ways to achieve this is by working together with other organisations to collect and share more data.

Contact information

For more information on the IICD Mali country programme and agriculture programme please visit www.iicd.org or send an email to information@iicd.org.

With the right tools, people in developing countries can considerably improve their livelihoods and quality of life. Better access to information and communication technology (ICT) is particularly vital in enabling them to achieve their goals. This is why the International Institute for Communication and Development (IICD) creates practical and sustainable solutions that connect people and enable them to benefit from ICT. As an independent not-for-profit foundation, we put knowledge, innovation and finance to work with partners from the public, private and not-for profit sectors. Together, we can make a world of difference.

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