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IFDC report

An update on the work and progress of IFDC

An Interview with IFDC's Africa Division Directors

AIMS, GADD, MADD and Katalyst II Projects Deliver Results

Specialized Fertilizer Blend Created for Cassava

Measuring Greenhouse Gases in Bangladesh

African Members of the IFDC Board of Directors

Improving Africa's Agricultural Sector

IFDC

IFDC*report*

IFDC is a public international organization, governed by a board of directors with representation from developed and developing countries. The nonprofit Center is supported by various bilateral and multilateral aid agencies, private foundations and national governments.

IFDC focuses on increasing and sustaining food security and agricultural productivity in developing countries through the development and transfer of effective and environmentally sound crop nutrient technology and agribusiness expertise.

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IFDC Divisions:
EurAsia (EAD) • East and Southern Africa (ESAFD) • North and West Africa (NWAFD) • Research and Development (RDD)

Frequently Used Acronyms:
African Fertilizer and Agribusiness Partnership (AFAP) • African Union (AU) • Alliance for a Green Revolution in Africa (AGRA) • autonomous mobile processing units (AMPUs) • Common Market for Eastern and Southern Africa (COMESA) • Competitive Agricultural Systems and Enterprises (CASE) • Comprehensive Africa Agriculture Development Programme (CAADP) • crop protection products (CPPs) • decision support system (DSS) • Dutch Agricultural Development & Trading Company (DADTCO) • East African Community (EAC) • Economic Community of West African States (ECOWAS) • farmer-based organizations (FBOs) • Feed the Future (FtF) • fertilizer deep placement (FDP) • Food and Agriculture Organization of the United Nations (FAO) • geographic information system (GIS) • greenhouse gas (GHG) • hectare (ha) • integrated soil fertility management (ISFM) • kilogram (kg) • kilometer (km) • market information system (MIS) • memorandum of understanding (MoU) • metric ton (mt) • Ministry of Agriculture (MoA) • monitoring and evaluation (M&E) • Netherlands' Directorate-General for International Cooperation (DGIS) • New Partnership for Africa's Development (NEPAD) • non-governmental organization (NGO) • public-private partnerships (PPPs) • Regional Agricultural Input Market Information and Transparency System (AMITSA) • U.S. Agency for International Development (USAID)

Sellers display their peppers and onions at a Malian market.

Africa Division Leaders Discuss Key Issues

Recently, IFDC Report writers met with Rob Groot, director of IFDC's East and Southern Africa Division (ESAFD), and André de Jager, director of IFDC's North and West Africa Division (NWAFD), to discuss the evolution of agricultural development in Sub-Saharan Africa (SSA). The focus of the conversation was the holistic approaches that IFDC projects continue to integrate and escalate, such as public-private partnerships (PPPs); the clustering and networking of suppliers, producers and buyers based on specific crops; the use of natural resource management tools such as fertilizer deep placement (FDP) and integrated soil fertility management (ISFM); and the institutionalization of these combined tools through the Competitive Agricultural Systems and Enterprises (CASE) method of agricultural intensification.

IFDC is currently working in 27 African nations (see map on page 7). IFDC has worked in Africa since 1976 and has had a permanent office on the continent since 1987.

Excerpts from the interviews are found below.

Competitive Agricultural Systems and Enterprises

Q: *What is CASE?*

Groot: The agricultural sector in developed nations is very competitive and entrepreneurial. This is also possible in Africa, but it must be nurtured and built over time. CASE focuses on the development of agribusiness clusters, which are composed of farmer groups, credit institutions, extension services, agro-input providers and agricultural processors.

The idea is that for a certain commodity you can build an entrepreneurial center of excellence. Many development projects have introduced large-scale

Rob Groot, director of IFDC's East and Southern Africa Division, and André de Jager, director of IFDC's North and West Africa Division.

activities in Africa that take a very broad approach. Instead of reaching one million untargeted farmers through a broad approach, we think it is possible that we can create these centers of excellence and make thousands of specifically targeted participants flourish.

Q: *Empowerment is a crucial element of CASE. Can you explain this concept?*

Groot: The central idea of CASE is that all participants can develop their capacities and therefore control their own fates. We work to create the circumstances in which their fate is no longer in the hands of an external partner, but in their own control.

We identify entrepreneurs – people who have the spirit to make things happen and have the capacity to make changes. When we look at farmer groups, we always spot individuals who have the capacity to lead the group, but have never done so before – so we try to empower them. We give them the skills they need to organize farmers' groups so that these groups can independently access credit, buy agro-inputs [fertilizers, seeds and crop protection products, or CPPs] and build their businesses.

In many countries, the governments haven't created an environment that promotes change. The people that are often most ready for this change are farmers and agro-dealers. A national farmers' association can advocate for its members and explain to the government why a certain law or a certain subsidy is not beneficial. We try to create situations in which these groups develop their own voice.

Agribusiness Clusters

Q: *What is value chain development?*

de Jager: Agricultural value chain development links farmers to people and organizations that can help them grow, process, package, market and eventually buy the food they produce. There has been a lot of talk for many years about value chain development. We have seen many failures; we have seen small islands of success around certain commodities with small numbers of producers and actors involved. We want to build a solid foundation with essential groups – farmer-based organizations [FBOs], agro-dealers, traders, processors – that form an agribusiness cluster around one commodity, and multiply that success across nations and ultimately the African continent.

Once the successful agribusiness cluster has been formed, that foundation is used for further expansion and development of other activities and products. Then you must strengthen the value chain, so that the smallholder farmers and others dependent on it can build their businesses and independence. That way, if a processor closes down or leaves the country, the entire value chain does not collapse. The foundation of a good agribusiness cluster leads to more business, is more sustainable and can be up-scaled to include a much larger number of participants and options within the cluster.

Q: *What are agribusiness clusters and why are they important in building agricultural value chains?*

Groot: Linking farmers to markets is a concept heard quite often in development jargon, but we approach it in a rather innovative way. We know that if you want to increase productivity, at least two elements are needed – entrepreneurship and innovative farmers.

In the past, we would teach smallholder farmers how to apply best agricultural practices. But the next step is that the farmers will ask where to get inputs such as improved or hybrid seeds and fertilizer, how to access mechanization, etc. If farmers want to buy inputs, they need money; and often they need credit. Or, if an agro-dealer needs to buy large quantities of fertilizer to sell to farmers, he or she needs credit. The first component of an agribusiness cluster is a farmer organization; the second component is an agro-dealer; and the third component is a financial institution. Once these conditions are fulfilled, the farmer often produces more, but what are they going to do with the harvest?

The next step is to lead them to a food buyer or processing company. Another component is to improve the capacities of farmers through extension services. And finally you come to a situation in which the farmer organization, the agro-dealer, the financial institution, the extension service and the processing component are all collaborating. This is the beginning of an agribusiness cluster.

What we do in an agribusiness cluster approach is to try to improve the capacities of the participants individually and to improve their capacity to collaborate with each other. The concept is relatively simple because when these actors learn how to improve their incomes, they rarely leave; when I teach you how to triple your income, you are never going to forget it. The whole idea is that once those involved succeed in improving their livelihoods, the situation becomes sustainable, which allows IFDC to step back.

▲ The three components of CASE: 1) Agribusiness cluster formation – strengthening of local capacity for innovation and entrepreneurship, involving a diversified array of stakeholders; 2) Agricultural value chain development – linking farmers to others in the chain by emphasizing integration of all stakeholders and strengthening the agribusiness cluster; 3) Enabling institutional environment – capacity building that involves both public and private stakeholders and fosters improvements in the institutional environment for agribusiness development.

Integrated Soil Fertility Management

Q: *One component of CASE is ISFM, the combined use of mineral fertilizers and locally available organic amendments. How does ISFM increase soil fertility – one of the major causes of food insecurity in Africa?*

de Jager: In most farming systems in Africa, farmers are 'mining' more nutrients from their land than they are applying to it, which over time makes their soils poorer and poorer. Moreover, a high percentage of African soils are inherently poor and, because of the climatic conditions, organic matter content, which acts as a buffer, is relatively low. So those two elements – creating a buffer and making sure there are sufficient nutrient elements to feed the crops – are the most important aspects of ISFM. A key to the success of ISFM is that you are combining various nutrient sources.

There is an obvious need to increase the use of fertilizer within African agricultural systems. The current average use of 9.0 kilograms (kg) per hectare will not produce enough food to feed Africa. That means we have to make fertilizers more attractive to farmers. Fertilizers become more effective when they are used in soils that have

▲ Farmers in Burundi learn ISFM techniques.

enough organic matter, which helps prevent the nutrients from leaching into the subsoil or evaporating into the air.

ISFM also addresses the economic aspects of soil fertility. Fertilizers are very expensive for smallholder farmers. By combining fertilizers with available organic matter, the effectiveness of the investment in fertilizers increases and leads to better and more durable financial returns.

Q: *How successful has IFDC been in transferring ISFM methods to farmers?*

de Jager: IFDC has introduced hundreds of thousands of African farmers to ISFM. We have been quite successful with a number of innovations and the success comes from the fact that this has not been done in isolation. IFDC disseminates information on a range of best agricultural practices. IFDC's work is not confined to only research –or solely to soil fertility and productivity increases. IFDC provides relevant information about input and output markets, varieties and good agricultural practices. Farmers can make an informed choice to adopt certain practices beneficial to them.

Increasingly, IFDC has been implementing ISFM techniques within an agribusiness concept. We see that ISFM adoption is much higher in an enabling agribusiness environment. If there is a reliable market for their surplus produce, if they realize a profit, farmers are going to invest in their soils. If we can develop the appropriate technology in which farmers can invest, then that will work in practice. I think the adoption rate, for instance, of FDP technology in Bangladesh has been high because it has financially benefited the farmers who have adopted it. We believe strongly that we can conduct similar expansion in African farming systems as well.

Public-Private Partnerships

Q: *What are public-private partnerships in the agricultural sector and what role do they play in the success of agricultural development?*

de Jager: PPPs are partnerships between public sector institutions and private sector organizations that undertake an activity together that they cannot accomplish individually. The partners need each other to achieve more success – the sum is greater than the parts.

PPPs are an excellent instrument because we need private sector partners to sustain processes – to sustain the food processing technology, to sustain market access – which cannot be provided by the public sector alone. On the other hand, many companies are interested in investing in Africa. They cannot do it alone; they need public sector support.

Groot: IFDC is convinced that the market is the driver for agricultural development. These food markets are

often composed of consumers, but more often they're composed of private sector companies. It can be a cereal miller, or a brewer, or a multinational corporation like Friesland Campina. These are private parties that procure crops to produce products for the marketplace. As a public international organization, IFDC has worked for years to establish viable public-private partnerships that benefit the partners and participating smallholder farmers.

Q: *What is an example of a public-private partnership in which IFDC has been involved?*

Groot: IFDC is currently partnering with the cassava processing industry. Cassava is a root crop produced all over Africa. However, once it is harvested – removed from the soil – it must be processed within 48 hours; otherwise, it starts to spoil. It's a great source of starch, and many countries have started to build factories to produce starch from cassava, not realizing that smallholder farmers do not have the capacity to transport the roots over a long distance and also not realizing that 70 percent of the root is water. In many parts of the continent, these processing factories are too often standing idle.

We are working with a private sector company – the Dutch Agricultural Development & Trading Company, or DADTCO – that is decentralizing cassava processing. DADTCO has developed a cassava factory built into a truck trailer that can be moved close to the cassava fields where it is processed into 'cassava cake.' The process removes water, and therefore weight. Transporting the cassava cake is cheaper than transporting the entire cassava tuber, and the cake is a stable product that will not spoil for months. Because the processing unit is mobile, once the farmers have delivered their produce, the unit can move to another location.

▲ Nigerian farmers prepare cassava to be processed into cassava cake using an autonomous mobile processing unit (in background) developed by the Dutch Agricultural Development & Trading Company (DADTCO).

Interestingly, cassava cake can be used to produce flour (in Nigeria, there is a large market for cassava flour), but it can also be used as a key ingredient to brew beer. IFDC currently works in a PPP with DADTCO and SABMiller in Mozambique and is expanding these activities into other countries where cassava is used to produce cassava-based beer. I think this is a great example of a PPP because the private sector creates the demand. In this case, we know that the demand for beer is there and will grow. At the same time, it creates a situation in which smallholder farmers have access to a guaranteed market – they know they can grow cassava and sell it at a pre-established price to a specific buyer.

2SCALE

In 2012, the Netherlands' Directorate-General for International Cooperation (DGIS) recognized the progressive and holistic nature of the CASE methodology in agricultural development and provided funding for the pan-African project, Toward Sustainable Clusters in Agribusiness through Learning in Entrepreneurship (2SCALE). The project focuses on the development of competitive rural agricultural systems, viable agro-enterprises and PPPs. Its strategic objective is to develop a portfolio of 500 robust and viable agribusiness clusters and value chains. 2SCALE is

being implemented by IFDC, the International Centre for development oriented Research in Agriculture (ICRA) and Base of the Pyramid Innovation Center (BoP Inc.).

Q: *Can you provide a general overview of the 2SCALE project?*

de Jager: The 2SCALE project is facilitating the development of agricultural markets in Africa by involving the private sector to increase production and create increased livelihoods for smallholder producers. The project is built on the successful implementation of earlier IFDC projects in West Africa. Over the last five years, IFDC facilitated the development of about 220 agribusiness clusters in which nearly 400,000 smallholders were effectively linked to markets. We have seen a sustainable increase in agricultural production by the smallholder farmers involved that resulted in increases in income levels of at least 50 percent.

The 2SCALE project is built on this success and is expanding those experiences by increasing the number of participants and involving large-scale private sector companies that have the potential to tap into larger markets. The number of countries where the project is being implemented is increasing as well, both in West Africa and East Africa.

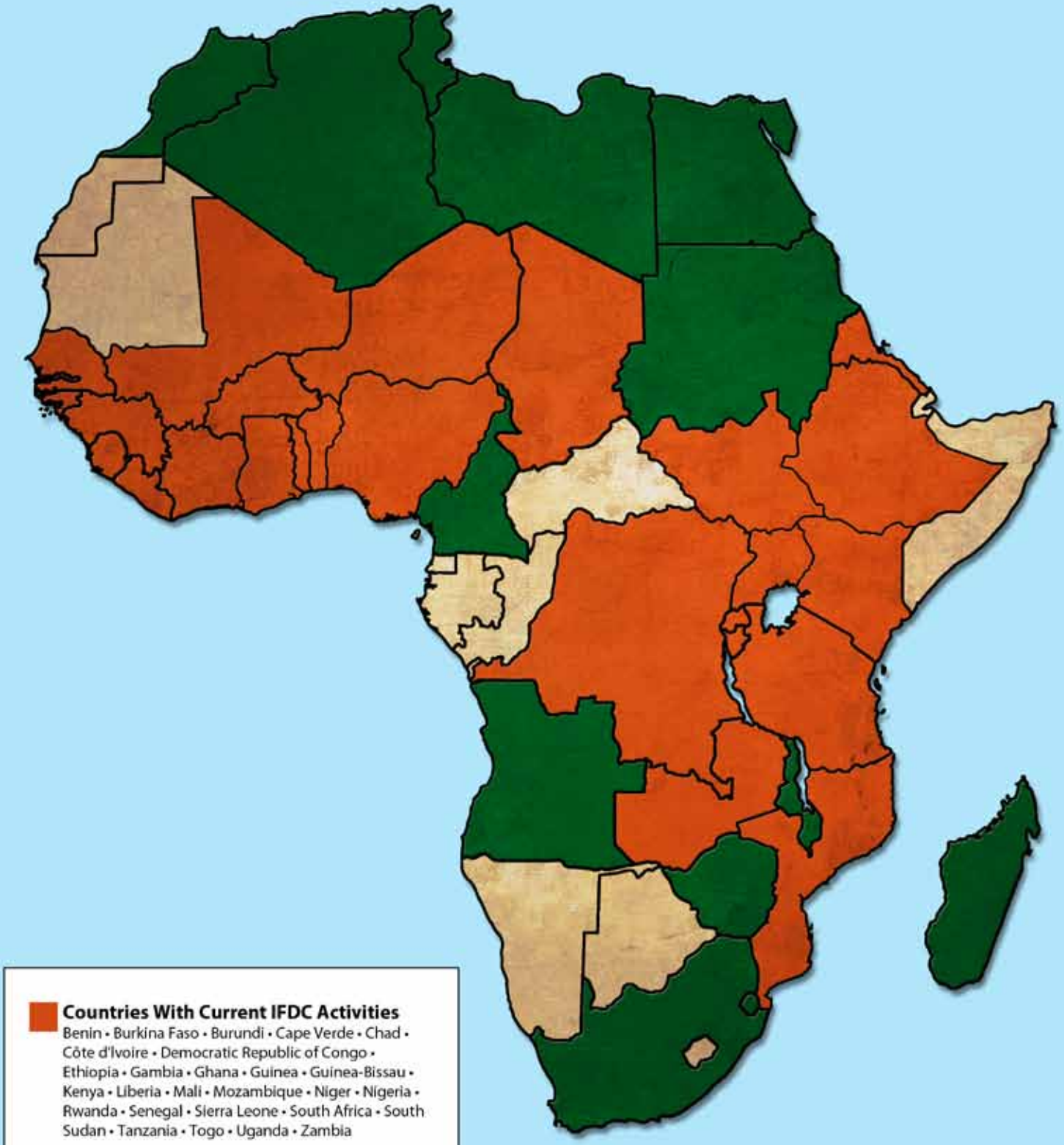
Another aspect of 2SCALE is that we are looking at the potential of developing food products for base-of-the-pyramid consumers – consumers who live on $1 or less a day. We would like to assist industry processors in developing specific products to reach that market.

Q: *What are the expected outcomes of 2SCALE, and how will the project ensure value chain sustainability?*

de Jager: To ensure sustainability, 2SCALE is using a game-changing approach in which we are partnering with private sector initiatives to build viable value chains. This will result in sustainable financial benefits not only for smallholder farmers but also for agro-dealers and financial institutions in rural areas. This will attract other private sector parties to become involved in the African agro-food sector. The results and the expected outcomes are much larger than the project itself. If it is successful – and we believe it will be – 2SCALE will demonstrate that business can be done as effectively in Africa as elsewhere.

▲ Women at work at a vegetable packaging station in Ethiopia.

IFDC in Africa



Countries With Current IFDC Activities
Benin • Burkina Faso • Burundi • Cape Verde • Chad • Côte d'Ivoire • Democratic Republic of Congo • Ethiopia • Gambia • Ghana • Guinea • Guinea-Bissau • Kenya • Liberia • Mali • Mozambique • Niger • Nigeria • Rwanda • Senegal • Sierra Leone • South Africa • South Sudan • Tanzania • Togo • Uganda • Zambia

Countries With Previous IFDC Activities
Algeria • Angola • Cameroon • Egypt • Libya • Madagascar • Malawi • Morocco • Sudan • Swaziland • Tunisia • Zimbabwe

Farmers, traders and others in the agricultural value chain are using mobile phones to exchange real-time market and price information.

IFDC Streamlines Delivery of Market Information and Key Services

In order to build comprehensive, credible sources of market information for all stakeholders, IFDC is utilizing a standardized portfolio of market information systems (MIS), monitoring and evaluation (M&E) tools, geographic information system (GIS) software and project management tools across its projects.

"The lack of accurate, up-to-date information on agro-inputs is one of the major constraints to agricultural productivity and to the development of business linkages and trade," stated Patrice Annequin, IFDC market information specialist. "Increasing access to market data is critical to connect farmers, agro-dealers, processors and other stakeholders along the agricultural value chain to market opportunities."

Market information includes data such as agro-input and commodity prices, trade statistics and directories of importers, suppliers, agro-dealers, etc. A market information system is a set of integrated processes and tools that deliver critical information and services.

"Using a harmonized set of tools and coordinated MIS programs will result in more efficient and transparent markets and ultimately will improve livelihoods," said Annequin.

To effectively deliver market information services, IFDC is expanding the use of the mFarms suite of applications in Africa. Developed by Image-AD, a Ghanaian company and leader in mobile application systems, the mFarms platform helps agricultural value chain stakeholders communicate with each other efficiently, establish and maintain business relationships and manage the flow of goods and services using mobile phones or the Internet. Information on value chain participants is stored in geo-referenced databases.

For example, farmers and agro-dealers can conduct research to obtain the best prices, contact transportation companies and arrange for movement of their produce and products via text messages (called short message service, or SMS). Extension messages can be sent to thousands of farmers concurrently via SMS, an interactive voice response service, or e-mail. Currently, mFarms is being used successfully to link smallholder farmers at the base-of-the-pyramid to structured staple food markets and to plan, monitor and market agricultural inputs and food products.

In Ghana, mFarms has been used as a value chain management tool by two IFDC projects – Ghana Agro-Dealer Development (GADD) and Linking Farmers to Markets (FtM) – both funded by the Alliance for a Green Revolution in Africa (AGRA). IFDC and AGRA formally launched mFarms in October 2012. FtM uses mFarms to carry out extension monitoring activities and to collect and store data on farmers' production plans. Agro-dealers can use the stored information to determine how best to prepare for the upcoming season.

One of the milestones of the GADD project (2008-2012) was the establishment of a directory of agro-dealers. In 2009, GADD profiled nearly 3,000 agro-dealers using GPS hand-held devices and paper-based questionnaires. In 2011, GADD 'went paperless' and updated the database using the mSurvey module, which enables real-time collection of data from GPS-enabled mobile phones or tablets.

Developed by staff of the GADD project and IFDC's Marketing Inputs Regionally (MIR) Plus project, the Market Information Platform for Agro-Dealers (MIPAD) enables agro-dealers and market surveyors to share prices for agro-inputs from 10 countries in West Africa using standard mobile phones.

Similarly, in eastern and southern Africa, IFDC staff members responsible for the Regional Agricultural Input Market Information and Transparency System (AMITSA) are training agro-dealers to collect and upload prices monthly using the mobile version of MIPAD. Data are compiled and shared via www.amitsa.org, an interactive, web-based portal, and redistributed by SMS to more than 6,000 agro-dealers across nine countries in the region. Launched in 2009, AMITSA is a collaborative effort of IFDC, the East African Community (EAC) and the Common Market for Eastern and Southern Africa (COMESA) to improve access to market and technical information on agricultural inputs.

MIS tools will also be critical to the success of recently initiated projects. For example, agribusiness clusters developed through the 2SCALE project will use MIS to organize supply chains and improve access to technical and market information for millions of farmers.

MIS and information and communication technology (ICT) tools will only increase in importance to the agricultural sector. These tools will enable increased agricultural production and sustainability. Therefore, IFDC is fully committed to continuing the enhancement of its MIS and ICT efforts in order to provide the most useful information across the agricultural value chain.

- GADD helped to strengthen the capacities of 2,388 agro-dealers.
- (Opposite): Technology transfer centers helped transform agro-dealers into 'informal' extension agents, making them better able to help their farmer-customers.

GADD Increases Access to Agro-Inputs

in Ghana

In collaboration with the Ghana Agricultural Associations Business and Information Centre (GAABIC), IFDC was awarded the three-year Ghana Agro-Dealer Development (GADD) project by AGRA. Activities were implemented between October 2008 and March 2012.

The goal of the GADD project was to support 2,200 agro-dealers (including 730 previously trained by IFDC) and 150 seed producers to foster an increase in the agricultural productivity, incomes and well-being of more than 800,000 smallholder farmers. This was accomplished by increasing the availability, accessibility and affordability of quality agro-inputs (improved and hybrid seeds, fertilizers and CPPs) in rural areas in Ghana. GADD helped address the inherent challenges confronting smallholder farmers' access to improved agricultural technologies and practices – particularly quality and appropriate agro-inputs – in the food crop sector in Ghana. GADD developed and implemented proven strategies and methodologies to build agro-dealer networks that significantly contributed to smallholder farmers' increased access to agro-inputs. The project stimulated more efficient distribution and additional/more effective use of agro-inputs by farmers through four complementary components.

Agro-Dealer Capacity Building

Project staff worked to build both the technical knowledge and managerial competencies of agro-dealers so that they could better serve farmers (particularly smallholder farmers in rural areas). The project helped to strengthen the capacities of 2,388 existing and new agro-dealers through training, enabling them to provide quality agro-inputs and advice on their appropriate use. The training helped to transform agro-dealers into 'informal' extension agents, better able to transfer agricultural technologies to their farmer-customers.

Project activities also provided information on the investment opportunities in the agro-dealer sub-sector in Ghana through GIS mapping, created business linkages with seed and other input suppliers and facilitated an increase in the number of retail outlets to supply farmers with agro-inputs, especially in rural areas.

To standardize all agro-dealer trainings in Ghana, the project worked in collaboration with the Environmental Protection Agency (EPA) and Plant Protection and Regulatory Services Directorate (PPRSD) of the Ministry of Food and Agriculture (MoFA) to develop a curriculum for agro-dealer training. Agro-dealers who completed the full curriculum were certified and awarded certificates by EPA and PPRSD. Prior to the GADD project, these regulatory agencies did not require agro-dealers to complete an approved certification course before they were granted a license. Because of GADD, the training has become mandatory for agro-dealer licensing.

GADD also organized training for the Seed Producers Association of Ghana (SEEDPAG) in technical and business management sessions. The training sought to strengthen both the managerial and technical skills of the seed producers in order to increase production to meet the increasing demand for improved seeds in Ghana. A total of 191 seed producers were trained (six percent were women).

The project customized a telephone-based SMS platform to link seed producers to agro-dealers. Through this platform, agro-dealers were able to send requests to seed producers for specific types and quantities of seeds they would require before the farming season. In total, 35 seed producers and distributors were trained in ICT tools. The project worked with these agro-input supply companies to improve their distribution systems through the SMS platform. In addition, two editions of a directory of Ghanaian agro-dealers were produced and distributed to help link the country's farmers to agro-dealers.

Institutional Strengthening

The project provided technical assistance and training to the GAABIC staff and its consortium of associations to serve their members and customers effectively and advocated for policy reforms. GADD helped GAABIC to streamline its financial and human resources functions and GADD developed strategies to help GAABIC generate revenue to become financially self-sufficient. GADD staff members assisted GAABIC to develop and submit a proposal to AGRA to implement the Agricultural Value Chain Mentorship Project in the Northern Region.

GADD also provided technical support to the Ghana Agricultural Input Dealer Association (GAIDA) through training and the organization of media events, including educational programs on national television and radio. These methods increased farmers' awareness of why purchasing agro-inputs from trained and licensed agro-dealer sales outlets is important.

Financial Support

The project facilitated agro-dealers' access to credit through risk-sharing arrangements to help expand their business operations. GADD collaborated with Unique Trust Bank and Stanbic Bank to disburse loans valued at over $2.8 million to 175 agro-dealers through an AGRA credit guarantee fund. Apart from the credit accessed by agro-dealers under the guarantee fund, GADD assisted 130 members of SEEDPAG and other agro-dealers to access loans valued at $459,594 from the Agricultural Development Bank, Ghana Commercial Bank and a number of rural banks.

In all, over 300 agro-dealers and seed producers received loans valued at more than $3.3 million. In collaboration with GAIDA, project staff developed strategies to extend the AGRA credit facility to agro-dealers after project-end. GAIDA led the negotiating process with commercial banks while GADD acted as the facilitator.

Technology Transfer

The project trained agro-dealers in methods to provide services to farmers as well as methods to transfer technologies and best agricultural practices. The project established three Technology Transfer Centers (TTCs) in the Ashanti, Brong Ahafo and Volta regions to provide opportunities for agro-dealers to showcase their products. GADD strengthened existing farmer-agro-dealer and agro-dealer-importer relationships through the establishment of demonstration plots, exhibitions and farmer field days. Supplier linkages during the crop demonstrations and exhibitions served as an incentive for new entrepreneurs to enter the agro-input

business while encouraging others to extend their businesses closer to smallholder farmers.

The project established 273 demonstration plots and organized 465 field days across Ghana. Nearly 17,000 farmers participated in these activities (11,041 men/5,751 women). The demonstration plots were established in collaboration with SEEDPAG (including AGRA-funded seed companies), GAIDA, CropLife Ghana, MIR Plus, agro-dealers and agricultural extension officers at MoFA District Directorates. The technologies demonstrated included the use of improved crop varieties, crop-specific fertilizer blends and correct rates of fertilizer application.

Key GADD Outcomes Include:

- Increased opportunities for greater agricultural productivity and incomes for more than 800,000 smallholder farmers through improved access to agro-inputs and the transfer of good agricultural practices and techniques via agro-dealers and TTCs.
- More than 2,300 agro-dealers and 150 seed producers were trained and are now supplying farmers with improved agro-inputs and technologies.
- New sales outlets opened, improving smallholder farmers' access to agro-dealers through a reduction in the distance traveled to purchase agro-inputs.
- Sales of improved seed increased by 40 percent over three years.
- Annual fertilizer use increased by more than 100 percent. The increase was partially a result of the introduction of a subsidy by the Government of Ghana.
- GAABIC reached organizational, managerial and financial sustainability.
- GAIDA is now organizationally sustainable and able to provide members with technical, business, marketing and extension skills. GAIDA's membership increased from 700 to 1,200 due to GADD efforts.
- GAIDA and SEEDPAG members leveraged the credit guarantee fund to obtain more than $3.3 million in credit to expand their businesses.
- The project collected data and monitored 36 indicators using a performance monitoring plan. Of the 36 output indicators, the project achieved targets set for 28 indicators.

▲ **An agricultural extension agent speaks to farmers at a seed fair.**

◀ **(Opposite): Smallholder farmers and agro-dealers attend a training session on specific types and quantities of seeds.**

MARKETS II and Notore Develop Nigeria's UDP Briquette Market

▲ Farmers in Gombe State, Nigeria, attend a field day demonstrating UDP technology.

IFDC is facilitating a PPP between Notore Chemical Industries Ltd. and Nigeria's National Program for Food Security (NPFS) to promote urea deep placement (UDP) technology and facilitate the supply and demand of urea briquettes in Nigeria. These activities are implemented under the umbrella of the Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites II (MARKETS II) project, funded by the U.S. Agency for International Development (USAID). In addition to promoting the use of new technologies, IFDC is continuing to strengthen Nigeria's fertilizer sector by improving targeted farmers' access to agro-inputs.

With funding from NPFS and USAID, MARKETS II loaned Notore two machines that manufacture urea briquettes and trained Notore workers on how to use them. Since early 2012, Notore has produced, packaged and marketed the urea briquettes in 10-kg bags and has the capacity to produce up to 12 metric tons (mt) of briquetted urea per day at its urea manufacturing facility in Onne, Nigeria. The company is distributing the briquettes via its supply channels to agro-dealers located in rice-growing regions where MARKETS II is facilitating UDP demonstration fields. To date, these project regions account for 70 percent of Notore's briquette sales.

UDP – the insertion of urea briquettes into the rice root zone after transplanting – can reduce fertilizer use by 35 percent while increasing crop yields by about 20 percent. Since April 2012, more than 1,800 farmers have attended MARKETS II field days in Gombe, Kebbi and Niger states to learn about UDP technology and observe its effect on rice production. The field days were conducted in collaboration with NPFS, Notore extension staff, agro-dealers and agricultural extension agents from the states.

Demonstration plots were implemented on 12 farms in each state in 2012. Participating farmers maintained one plot that tested UDP technology and one plot in which urea was broadcast; the only variable was the fertilizer application technique. Farmers and extension agents recorded the impact of UDP technology on the 36 demonstration fields. On plots averaging 400 square meters (m^2), farmers were able to harvest an average of 2.69 mt more rice using UDP technology than broadcasting urea on transplanted rice seedlings.

IFDC has been conducting FDP/UDP field trials and demonstrations across Africa, and the results in Nigeria are consistent with the experiences of other African rice farmers who have used UDP. The higher yields offset the additional labor required to deep-place individual briquettes.

As a result of increasing yields, Notore sold nearly 7,000 10-kg bags during the 2012 market trial. In order to expand upon this success, MARKETS II plans to

implement at least 10 additional farmer demonstration plots during the 2012-2013 dry season in four rice-growing regions across northern Nigeria. Additional UDP field demonstrations will be coordinated among partners for the upcoming 2013 rainy season to increase the awareness and demand for briquetted urea among Nigeria's rice farmers.

In addition to demonstration fields, MARKETS II has developed an illustrated UDP training manual in two languages for rice farmers who want to learn about the technology. The project is also developing a training curriculum for Notore's supply chain participants as well as for FBO lead farmers.

The original MARKETS project was implemented from 2005 to 2010, and a bridge-funding project linking MARKETS and MARKETS II was implemented during 2011. MARKETS II is implemented by Chemonics International in collaboration with a consortium of partners including IFDC.

Notore

The government-run National Fertilizer Company of Nigeria (NAFCON) urea fertilizer production facility closed in 1996. The only urea plant in SSA, the facility re-opened as the privately owned Notore Chemical Industries Ltd. in 2009. Located at the sea port of Onne in the Niger Delta, Notore manufactures urea, NPK (a blend of nitrogen, phosphorus and potassium) and ammonia fertilizers.

IFDC played a role in transforming NAFCON to Notore. In 2004, an IFDC senior technical specialist conducted a USAID-funded study to determine how Nigeria could better meet its need for nitrogen fertilizer. The study concluded that the most efficient way to re-establish urea production in Nigeria was to privatize, rehabilitate and re-open NAFCON.

Notore acquired NAFCON in 2005. Today, the plant produces 1.5 million mt (mmt) of ammonia and 500,000 mt of urea per year.

- Notore staff members operate a fertilizer briquetting machine.
- Farmers attending a UDP demonstration are assured by Notore staff members that urea briquettes will be available in their local markets.

IFDC Introduces New Fertilizer Blend Specifically for Cassava, Other Tubers

▲ Farmers prepare to plant cassava stems.

In partnership with the Federal Government of Nigeria (FGN), Taraba State, DGIS and IFDC, fertilizer producer Notore Chemical Industries Ltd. has launched the first compound fertilizer blended specifically for tuber crops such as cassava and yams. The new fertilizer should help increase the yields of these key crops.

The specialized fertilizer was launched in the Wukari area of Taraba State in northeastern Nigeria under the cassava input initiative, a component of the Cassava+ project. According to IFDC Country Representative Scott Wallace, the blend includes a higher ratio of potassium, which is critical for water retention. "This specialized blend of nitrogen, phosphorus, potassium and sulfur will help cassava and yam farmers to increase their yields and maintain adequate soil fertility for years to come," Wallace stated in an interview with the radio broadcasting company Voice of Nigeria.

Nigeria produces more than 38 mmt of fresh cassava roots per year, the largest harvest in the world. However, this key crop is not widely grown for commercial markets because of its short shelf-life after harvest. Deterioration begins within 48 hours, making it difficult for industrial processing companies to collect and process the tubers prior to spoilage.

To address the issue, DADTCO, a Netherlands-based company that improves rural development by creating guaranteed markets for crops grown by smallholder farmers, has developed autonomous mobile processing units (AMPUs). The units reduce the need for farmers to transport the perishable cassava over long distances. The

Cassava+ PPP among IFDC, DADTCO and the Taraba and Rivers state governments utilizes AMPUs to bring cassava processing close to farms, and offers a guarantee to purchase surplus cassava from participating farmers at a preset price.

Wallace noted that the new fertilizer blend would allow cassava farmers to take even greater advantage of the revolutionary DADTCO guaranteed market. "As cassava farmers begin to use the new fertilizer blend, they will see larger and healthier tubers," said Wallace. "This will immediately impact the farmers' incomes in a very good way, while increasing the tonnage of cassava raw material that DADTCO markets commercially."

New Programs Accompany Tuber Fertilizer Blend

According to Wallace, IFDC, in partnership with the FGN and Taraba State, also launched a 'farm doctor' program that provides training to youth to safely and effectively spray CPPs on smallholder farmers' fields.

> **As cassava farmers begin to use the new fertilizer blend, they will see larger and healthier tubers.**
>
> **– Scott Wallace, IFDC Country Representative**

The program was established in partnership with two major CropLife members, Swiss Biostadt (a distributor of Syngenta CPPs) and HarvestField Industries Limited, with assistance from local agro-dealers. The initiative involves 47 young farmers chosen from eight local government areas in which the Cassava+ project operates.

▲ Cassava is loaded onto an AMPU conveyor belt for processing.

Another project advancement is the cassava stem distribution program, which provided 60 truckloads (over 7,000 bundles) of improved planting materials to agro-dealers to sell to Taraba's cassava farmers. The cost to transport the bundles of improved cassava stems was subsidized by the Taraba State Government and Cassava+.

The Cassava+ project (2010-2013) is funded by the Schokland Fund, which was established by DGIS. Implemented by IFDC and DADTCO, the project goal is to provide a guaranteed market for smallholder cassava farmers, helping them to move from subsistence to commercial production.

In addition, Cassava+ activities are being expanded to Ghana, Mozambique and South Sudan. Smallholder farmers in Mozambique's Nampula Province are currently working with IFDC and DADTCO to grow cassava roots to be processed into cassava cake, paste, flour and other products for commercial use, such as Impala, the cassava beer brewed by SABMiller's Mozambican affiliate, *Cervejas de Moçambique*.

IFDC Participates in International Food Exhibition in Togo

Togo's Minister of Agriculture, Livestock and Fisheries, H.E. Ouro Koura Agadazi (center) speaks with Patrick Tèvi-Benissan (right), chief of staff for Togo's president, at the SIALO event. Looking on are Ketline Adodo, IFDC communications officer, and Daniel Tito Heatson Attikpo, organizer of SIALO.

IFDC was an active participant at the first International Food Exhibition in Lomé (*Salon International de l'Agroalimentaire de* Lomé [SIALO]), held at the Togolese Centre for Exhibitions and Fairs in August. SIALO was organized under the auspices of Togo's Ministry of Agriculture, Livestock and Fisheries.

The exhibition was organized to provide opportunities for networking meetings, business exchanges and service provision among those involved in agriculture, livestock and fisheries in West Africa. SIALO promoted PPPs for sustainable market-based agricultural development (thereby supporting IFDC's food security initiatives). SIALO's theme was "food security," according to event coordinator Daniel Tito Heatson Attikpo.

In his opening remarks, H.E. Ouro Koura Agadazi, Togo's Minister of Agriculture, Livestock and Fisheries, emphasized the relevance of initiatives such as SIALO, which can help capitalize on advances in the agricultural sector by providing a forum for information, promotion and exchange of experiences and know-how. Such events should improve competitiveness along the value chains of the agricultural sector, which can then bring growth and jobs.

"During the June 2012 West African Economic and Monetary Union [UEMOA] Summit held in Lomé, heads of state and government voiced their concerns regarding the sharp production decline recorded during the 2011-2012 crop year and its impact on West African food security," Minister Agadazi stated. "There was a clear call for all Member States to mobilize resources and remove barriers to the implementation of projects identified within the framework of the Special Program for Food Security."

IFDC has been working to improve food security in Togo since the establishment of its first continental operations base in Lomé in 1987. During August, Minister Agadazi and representatives of IFDC signed a services agreement within the framework of the Agricultural Development Support Project in Togo (*Projet d'Appui au Développement de l'Agriculture au Togo* [PADAT]). PADAT is one of three projects designed to complement Togo's National Agricultural and Food Security Investment Program (PNIASA), which was officially launched in February.

Under this agreement, IFDC is implementing the ISFM component of PADAT in Togo's five economic regions (Centrale, Kara, Maritime, Plateaux and Savanes). PADAT is a four-year project focusing on three target crops – maize, rice and cassava. It aims to disseminate ISFM and other good agricultural practices in maize, cassava and rice farming areas to intensify production and increase incomes in Togo. The $63.5 million project is funded by an alliance of donors including the International Fund for Agricultural Development (IFAD), Economic Community of West African States (ECOWAS), Bank for Investment and Development (EBID), the West African Development Bank (*Banque Ouest Africaine de Développement* [BOAD]) and the Global Agriculture and Food Security Program (GAFSP).

Another project in the spotlight was MIR Plus, a joint ECOWAS-UEMOA project implemented with IFDC's technical assistance. MIR Plus is facilitating the development of a regional agro-input market in West Africa to increase agro-input availability and affordable access for smallholder farmers. The project focuses primarily on seeds, fertilizers and CPPs. The project's activities aim to: improve policy and regulatory content; support innovative approaches that will increase input use as a means to increase productivity; improve the availability of market information to the region's farmers and agro-dealers; and ensure that FBOs have better access to quality and affordable agro-inputs. DGIS funds IFDC's technical assistance to MIR Plus, while the operational costs are borne by the two regional economic communities (RECs) with a contribution from DGIS.

▲ **IFDC's information booth at the first International Food Exhibition in Lomé, Togo.**

There was a clear call for all Member States to mobilize resources and remove barriers to the implementation of projects identified within the framework of the Special Program for Food Security.

– H.E. Ouro Koura Agadazi

USAID WACIP Creates Market Linkages for Textile Artisans

The USAID West Africa Cotton Improvement Program (USAID WACIP) is helping increase farmers' incomes in cotton-growing areas and increasing the added value of cotton processing by artisans and ginners. Implemented by IFDC since 2006, the program covers Benin, Burkina Faso, Chad and Mali, commonly known as the C-4 countries, as well as Senegal.

To meet one of the program's objectives of increasing artisans' revenue in the targeted countries, USAID WACIP conducts artisanal activities with its technical implementing partner, Aid to Artisans (ATA), a U.S.-based international non-governmental organization (NGO). Since 2007, artisans have received training from ATA in business skills and management, exporting regulations and requirements and color and design. ATA has also trained artisans in modern textile production, methods of adapting locally woven fabric and measures to identify and reduce occupational and environmental risks. ATA has supported artisans' participation at local, regional and international trade fairs where they displayed and marketed their products.

The project has generated excellent results. Today, these creative artisans, talented in craft production and promotion, offer the world their best hand-woven textiles such as bogolan, appliqué and batik, as well as home décor and fashion accessories.

To support this initiative, USAID WACIP assisted nine artisanal enterprises from Benin, Burkina Faso and Chad to participate for a third time at the *Salon International de l'Artisanat de Ouagadougou* (SIAO) from October 26 to November 4, 2012. SIAO is one of Africa's most renowned craft fairs. During SIAO 2008 and SIAO 2010, nearly $52,000 in sales was generated by the more than 300 new cotton products developed by these small enterprises.

Another objective of SIAO 2012 participation was to strengthen the capacity of exporters by creating links between buyers and producers. This will eventually lead to the creation of new sustainable market linkages and generate increased sales for the artisans. SIAO represented a unique business opportunity for the C-4 artisanal enterprises to increase their incomes and consequently improve their livelihoods.

More than 700 new cotton products have been developed since the inception of USAID WACIP, generating more than $1 million in sales within local, regional and international markets.

(All Photos and Opposite): Artisans from the C-4 countries create cotton products that feature refined colors, patterns and quality.

SEW Value Chain Team Wins 1st Prize for Cook Stove Design

▲ Representing the SEW project at the cook stove competition are (left front) Anselme Vwambale, SEW consultant, and (second from right, back row) Aimé Kikuru. The other team members are from GIZ.

IFDC's Sustainable Energy Production through Woodlots and Agroforestry (SEW) project promotes sustainable energy production through reforestation and the development of wood fuel and charcoal value chains. Project staff members also seek ways to increase responsible fuel wood and charcoal production, agricultural productivity and incomes while decreasing negative environmental impacts.

SEW also supports the manufacturing of improved cook stoves. Production methods for ceramic inserts (liners) have been standardized, increasing the liners' quality and thermal efficiency from 19 to 44 percent. The stoves' greenhouse gas (GHG) emissions were also reduced. SEW continues to work with manufacturers to increase their quality and rate of production.

Recently, the SEW value chain team won first prize in an improved cook stove competition at the Aprovecho Research Center (ARC) in Cottage Grove, Oregon, USA. The SEW team traveled to the U.S. to attend two trainings on designing more efficient cook stoves that use charcoal or wood. Their stove, designed in the Democratic Republic of Congo (DRC), was recognized for 'best design' at Aprovecho. "The first place prize is the result of a team effort by SEW staff members and critical funding support from the German Agency for Technical Cooperation [GIZ]," said Aimé Kikuru, SEW national value chain expert, who is based in the DRC. "Each member of the SEW team learned a great deal at Aprovecho, particularly about the Center's modern portable emissions monitoring system."

For over 30 years, ARC consultants have been designing and implementing improved biomass cooking and heating technologies in more than 60 countries worldwide. The Center was established in 1976 and is dedicated to researching, developing and disseminating clean cook stove technologies to meet the basic needs of refugees, impoverished people and communities in the developing world. The SEW team also participated in the Combined Heat and Biochar training at the Biomass Energy Foundation of the New England Small Farm Institute in Belchertown, Massachusetts, USA.

"The SEW team had a number of interesting experiences in the U.S. We were able to plant trees with private sector groups, participated in value chain development and created positive linkages," Kikuru said.

SEW Hosts Brick-Making Training

SEW focuses on sustainable agroforestry and renewable sources of energy. The project also aims to decrease competition for land use between the energy and agricultural sectors by increasing tree production, agricultural productivity and incomes.

SEW is working to improve charcoal value chains and teaching best practices in brick-making in order to reduce wood consumption and also decrease air pollution. In 2011, ceramic technology expert André de Vries conducted a study mission to Burundi and developed an inventory of existing brick works. De Vries' analyses indicate that most bricks are produced using traditional methods, and field kilns are very energy-inefficient. Most brickmakers have little or no knowledge of advanced production methods such as the use of ceramics. Reducing the amount of wood used to fire bricks can have a major economic impact and significantly reduce deforestation, GHG and other environmental damage.

The brick industry in Burundi, DRC and Rwanda is characterized by many small-scale, traditional brick production sites, some large brickfields and a few mechanized brickworks. At the large brickfields, individuals rent parcels of land, dig clay and produce bricks on that same land (after building a rudimentary kiln).

Most kilns are too small and inefficient; few have the capacity to contain more than 20,000 bricks. Individually owned production sites may have larger kilns – holding from 20,000 to 250,000 bricks. Mechanized brickworks are rare – most are relics of brick-making activities run decades ago by missionaries. These suffer from lack of maintenance and spare parts. Most brickmakers dig their clay and use it 'as is,' without any analysis or formulation and they do not utilize any preparation methodology (mixing and/or homogenization). Bricks are made manually, often with pastes that are too wet and then are left to dry naturally (using sun and air). Therefore, the quality of the bricks varies widely and most bricks made in this manner do not meet elementary standards of dimension or strength.

De Vries' advice was that SEW should conduct a training, which would create a base for the development of a brick-making industry in the region. De Vries' trip was sponsored by the Dutch Manager Deployment Program (PUM). PUM connects entrepreneurs in developing countries and emerging markets with senior experts from the Netherlands who have at least 30 years of experience in a specific business environment. These senior experts voluntarily contribute their knowledge and skills to execute short-term consultancy projects.

▲ A traditional brick kiln in Burundi emits atmospheric pollutants.

Acting on de Vries' advice, SEW organized a brick-making and firing training in Bujumbura, Burundi, for 60 participants from the region. The Burundian Minister of Energy and Mines, Côme Manirakiza, also attended the training.

There were three separate five-day trainings that took place in August. The trainings were conducted by de Vries and Wim Pastoors, both of whom had prepared training materials in French for participants.

The training had two main objectives:

- Provide participants with information regarding brick-making so that bricks of good quality and of standard dimensions are produced.
- Raise participants' awareness of how to use efficient brick kilns that burn less wood, produce quality bricks and reduce environmental damage.

These best practices should guarantee a 10-15 percent reduction in the amount of wood burned while improving the quality of the bricks produced.

"This brick-making training was one of several large regional technical trainings provided by SEW," said André de Groote, SEW project coordinator and IFDC country representative in Burundi. "Participants including brickmakers, architects, government representatives, bankers and university professors made up a very good value chain combination and were enthusiastic about 'building up' the chain further following the training."

▸ **(Opposite): Training participants visit a traditional brick kiln in Burundi.**

◂ **(Top left): Kindling feeds a traditional kiln's fire.**

▾ **PUM ceramic technology experts André de Vries and Wim Pastoors (second and third from left) observe the quality of drying bricks with participants during the brick-making training in Burundi.**

Mozambique Agro-Dealer Development Project Improves Agricultural Sector

Mozambique's economy is still largely agriculture-based, and agriculture remains critical to stimulating overall economic growth and poverty reduction. Nearly 70 percent of the country's 23 million people live in rural areas and are largely dependent on agriculture for employment and livelihoods. Because of its importance to the country's economy, the Government of the Republic of Mozambique has implemented several programs to revitalize and strengthen the agricultural sector.

Under the New Partnership for Africa's Development (NEPAD) Comprehensive Africa Agriculture Development Programme (CAADP), Mozambique aspires to achieve a growth rate of six percent per year in agricultural production by focusing on land and water management, technology adoption, trade and commercial linkages and capacity building. Significant growth in the use of yield-enhancing agro-inputs is essential to achieve the CAADP goals. Although Mozambique permits the private sector to engage in the production, importation and distribution of agro-inputs and crop produce, the agro-input supply system remains weak. The agro-input marketing chain is underdeveloped with only a few suppliers at the national level and a small number of agro-dealers located mainly in district and provincial urban centers. Smallholder farmers have difficulty accessing inputs at competitive prices.

Responding to these factors, IFDC proposed the Mozambique Agro-Dealer Development (MADD) project to AGRA in 2008 to address constraints in the provision of and access to agro-inputs by farmers in key districts of Manica and Tete provinces in northern Mozambique. The constraints had a severe impact on the agricultural yields and livelihoods of farmers in those areas.

To mitigate these constraints, the project proposed: the development of a network of agro-dealers in urban, semi-urban and rural markets; strengthening the input supply chain in Manica and Tete provinces; and the formation of provincial agro-dealer associations. MADD also sought to: develop efficient movement and delivery of agro-inputs by enhancing the marketing skills and business linkages among the operators of the input supply chain; enhance agro-dealer/supplier

▲ A worker packages fertilizer at the Mozambique Fertilizer Company in Gondora.

access to commercial credit; and the transfer of crop production and input use technology to create agro-input demand.

The financial support provided by AGRA enabled MADD to build an organized private sector network of trained agro-dealers, which led to the more effective distribution of agro-inputs to small farm households. The project successfully contributed to the intensification of agriculture in the two targeted provinces.

The overarching goal of MADD was to contribute to the intensification of agricultural crop production in the target provinces by improving farmers' access to quality agricultural inputs at affordable prices at the right time. This goal was accomplished through project support to agro-dealers. The additional advantages generated through this support included increased use or adoption of yield-enhancing agro-inputs by project-targeted farmers; promotion of sustainable crop production technologies; and providing opportunities for business networking, which resulted in an overall reduction in the marketing costs of agricultural commodities in rural markets.

The major objectives of MADD were to: increase the availability of agro-inputs through an expanded and strengthened agro-input marketing chain (from producers to wholesalers to agro-dealers); reduce the costs of agro-input transactions and improve the provision of quality agro-inputs to farmers; and increase the adoption of best agricultural technologies to increase crop yields and farmers' income.

The MADD project complemented several other IFDC projects which operated in northern Mozambique, including the European Union (EU)-funded fertilizer voucher program implemented by the Food and Agriculture Organization of the United Nations (FAO), the USAID-funded Agricultural Input Market Strengthening (AIMS) project and the industry funded Maize Intensification in Mozambique (MIM) project. The uniqueness of MADD was its ability to attract and actively involve the private sector in the provision of agro-inputs to smallholder farmers through enhanced capacity-building activities for all stakeholders in the supply chain. MADD also successfully linked these stakeholders to financial institutions, creating successful business partnerships and long-term sustainability.

MADD Project Achievements

- 384 agro-dealers were trained and networked.
- 19 suppliers of seeds and fertilizers, including a local fertilizer blending factory, were linked with retail agro-dealers.
- 225 farm demonstrations were conducted.
- 192,000 farmers began using improved seeds and fertilizers as well as recommended crop management practices.
- 5,596 mt of fertilizers and 3,883 mt of improved seeds were sold through agro-dealers in the project area.
- 13 district-level agro-dealer trade associations were created. Effectively functioning associations helped convince agro-dealers to sell government-certified seeds in rural areas where there is limited service by existing government extension services.
- Through a credit guarantee fund, 158 agro-dealers gained access to credit ($268,722) from financial institutions for the first time.

Bags of seeds and other agro-inputs are stored in an agro-dealer's warehouse in Chimoio.

As a result of MADD project activities, 5,596 mt of fertilizers were sold in project target areas.

AIMS II Successes Key to AIMS III

▲ Customers purchase agro-inputs from an agro-dealer in Mozambique.

The second phase of the Agricultural Input Market Strengthening (AIMS II) project built on the achievements and the partnerships that were established during AIMS I, which began in 2006 and was implemented until AIMS II began in 2009. AIMS II ended September 30, 2012; activities during fiscal year 2012 (FY12) focused on: training existing agro-dealers and identifying new dealers; monitoring and harvesting crops at ISFM field demonstration sites; and planning for AIMS III (October 2012 to September 2014).

The project was conducted in the Beira and Nacala corridors of Mozambique, encompassing Manica, Nampula and Sofala provinces. During FY12, AIMS provided services to thousands of farmers, as well as extension officers and agro-dealers. However, due to late seasonal rains in central Mozambique and late planting in 2011, some key activities were not implemented.

In the Nacala Corridor, 149 meetings/trainings were held for 2,480 farmers (including 1,182 women). Eight government extension officers and 25 agro-dealers also were trained. During the trainings, the agro-dealers and extension officers discussed key issues and exchanged information about the response of maize to fertilizers, fertilizer market availability and demonstration plot results.

In a continuing effort to increase and expand the use of modern agro-inputs in conjunction with ISFM, 48 demonstration plots in the Nacala Corridor and 41 in the Beira Corridor were planted. Of those, 10 and 19 were harvested, respectively. Yield and gross margins were calculated in the fourth quarter of FY12. In the Nacala Corridor, treatment T6 (velvet beans, cowpeas and pigeon peas fertilized with 100 kg of NPK and 100 kg of urea) generated the highest yields and gross margins. In the Beira Corridor, treatment T2 (maize and pigeon peas fertilized with 100 kg of NPK and 100 kg of urea) generated the best results.

In FY12, three field days were organized in collaboration with government extension officers. AIMS staff assisted 2,891 beneficiary farmers and 14,455 indirect beneficiary farmers in 10 districts. Nearly 40 percent of these farmers were women. In addition, 63 agro-dealers (of whom eight percent were women) and 33 extension workers (24 percent women) attended IFDC activities. In the Beira Corridor, the expansion of the MIS platform through the use of Esoko technologies continued. Agro-dealers sold more inputs because of AIMS interventions and the increased use of MIS.

Collaborative efforts with partner organizations continued in FY12 in an effort to further promote ISFM and conservation agriculture. Michigan State University and the USAID Mission were instrumental in these activities.

In April 2012, a USAID delegation visited project sites in the Beira Corridor to assess progress to date and discuss new opportunities, challenges and the way forward. As a result of the visit, USAID asked IFDC to submit a concept note to continue AIMS for another two years and to continue the implementation of the AIMS objectives (with some key modifications) in the Beira and Nacala corridors.

▲ An agro-input shop in Nhamatanda, Mozambique.

Major Project Activities

The six activities carried out during AIMS II included:

Activity 1. Transfer of ISFM technologies

To successfully increase agricultural productivity in a sustainable manner, the development and adoption of improved agricultural practices are critical. ISFM has proven to be a low-cost, high-impact approach to increase the productivity of food crops in SSA. Given the low soil fertility levels in Mozambique, adoption of ISFM can increase the agricultural productivity and incomes of smallholder farmers in a sustainable manner. Therefore, it was essential that the Institute of Agrarian Research of Mozambique, the extension staff of each Provincial Director for Agriculture and agro-dealers were trained in ISFM technologies in order to successfully transfer these technologies to smallholder farmers. This was accomplished through demonstrations, participatory learning activities and collaboration with agro-dealers. Most smallholder farmers in Mozambique have very limited experience with improved seed and mineral fertilizers. Their knowledge of good agricultural practices also is limited and farmers need to be educated through demonstrations and extension support. Although the use of improved seed is increasing, without an adequate supply of nutrients, seeds will not generate the desired increase in productivity; improved seeds can only realize their full yield potential when fertilizers are applied. Moreover, use of improved seed without fertilizers will accelerate nutrient depletion from the soils, leading to soil degradation. Also, when farmers do not realize the promised higher yields from improved seeds (because they are not combined with increased fertilizer use), they will be less likely to continue to use them.

Activity 2. Strengthening the input supply chain and developing agro-dealers in rural areas

The prevailing fertilizer marketing system in Mozambique relies heavily on imports controlled by a few private enterprises as well as a recently established fertilizer blending plant. There are approximately 250 sales outlets/agro-dealers; prior to AIMS, these were primarily located in major market towns. The agro-dealer network is generally small and unorganized; this makes it very difficult for smallholder farmers to access improved seeds and fertilizers in rural areas. Marketing any surplus crops is also difficult for smallholder farmers for the same reasons. In most areas, farmers must travel 30-40 kilometers (km) or more to buy agro-inputs and/or to market surplus crops. Such long distances not only add to the cost of agro-inputs and crop marketing but also

Trained agro-dealers are able to provide their farmer-customers with critical product information.

Project Objectives:

- Increase the availability of agro-inputs (fertilizer, improved seeds and CPPs) in the Beira and Nacala corridors.
- Increase smallholder farmers' adoption of modern agricultural practices for key commodities in the Beira and Nacala corridors.
- Reduce the costs of fertilizers and seeds to smallholder farmers while also improving market access to agro-inputs.
- Increase the productivity of selected commodities in target areas.
- Enhance the commercialization of smallholder agriculture through linkages with input/output markets.
- Create a highly functioning input supply system.

discourage or prevent farmers from using modern agro-inputs and increasing their crop productivity.

Activity 3. Input sector policy reforms and regulations

An enabling and supportive policy environment for private sector development is essential in SSA. Currently there are no price or marketing controls on fertilizer in Mozambique; nor are there fertilizer laws or a fertilizer regulatory authority. The development of input markets is considered a private sector responsibility. Under such conditions there also is no quality control/assurance and importation of poor quality and adulterated fertilizer products cannot be halted. Due to inadequate product knowledge, agro-dealers and farmers often fail to buy the right products and suffer from poor results. Therefore, it is important to assist the government with the introduction and enactment of appropriate legislation and the establishment of a fertilizer authority to enforce the fertilizer legislation.

Activity 4. Strengthening MIS

Reliable and current market information is very helpful in business decision-making and price negotiations. It is essential for policy reforms and consumer awareness and a prerequisite for market transparency. For the past three years, the Ministry of Agriculture implemented SIMA, a market information project with donor and funding. However, this project focused primarily on crop produce prices and did not address agro-inputs. It is extremely difficult to obtain reliable information on fertilizer prices and/or their availability in Mozambique. Within the context of other projects and in close collaboration with COMESA and EAC, IFDC is currently expanding its AMITSA MIS platform into Mozambique. The Platform for Agricultural Research and Innovation in Mozambique will build on this ongoing activity.

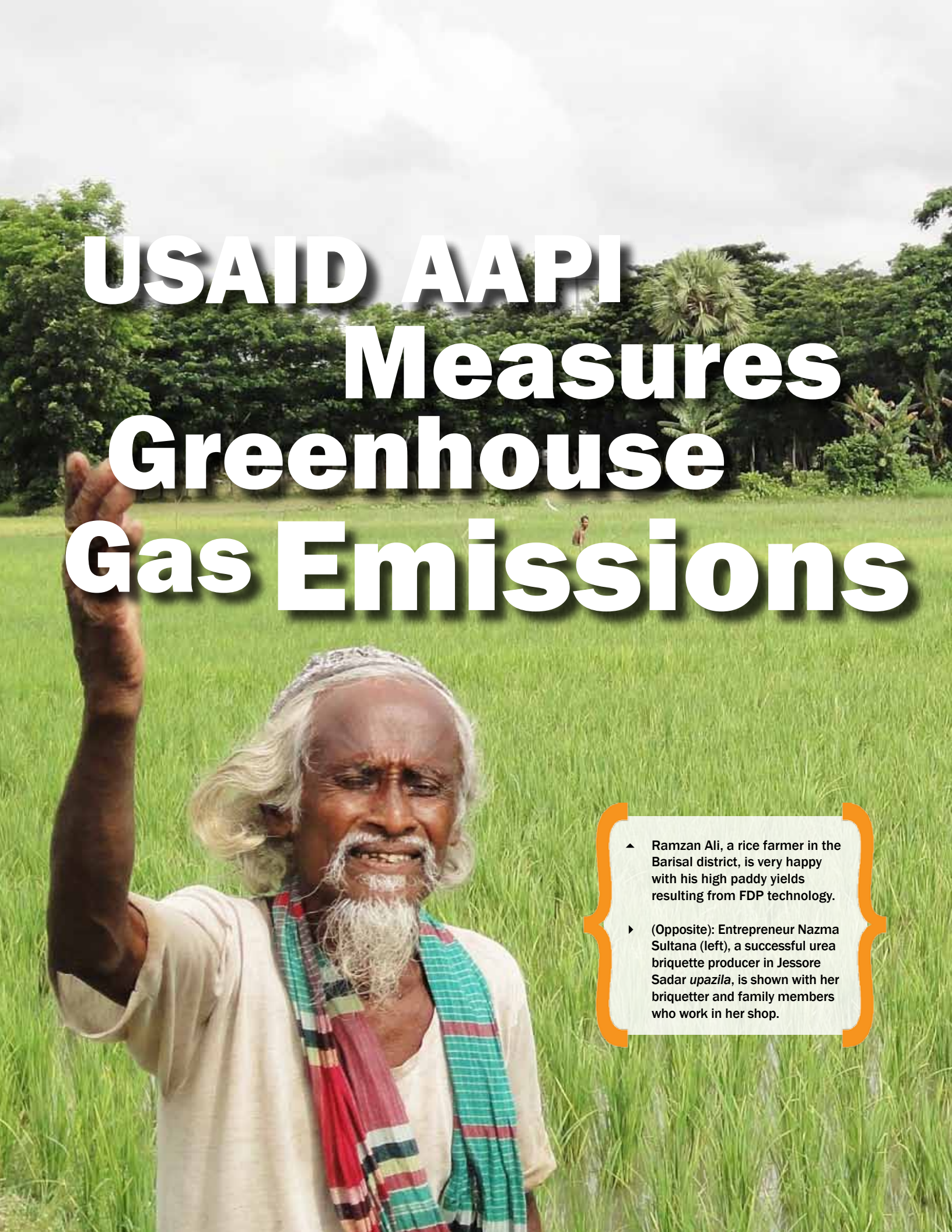
Activity 5. Strengthening agro-dealer trade associations

IFDC experiences in numerous countries have proven that when agro-dealers are organized in a functioning trade association they can pool demand, reduce costs through joint procurement and organize trainings to professionalize their business. An association also can advocate for the creation of a favorable policy environment for input market development.

Activity 6. Fertilizer and seed voucher system for poor farmers

Vouchers for fertilizer and seed provide incentives to invest in modern agro-inputs and provide purchasing power support. Such short-term incentives are essential in Mozambique because farmers are not yet accustomed to using improved technologies and they are unwilling to purchase expensive agro-inputs without first experiencing the benefits of their use. At the request of the Minister of Agriculture, a financial incentives program utilizing a voucher system for fertilizers and seeds was designed for the 2008-2009 cropping season. However, it was not implemented due to insufficient funds. In the 2009-2010 cropping season, with funding support from the EU and FAO and technical support from IFDC, a fertilizer and seed voucher system was implemented and benefited 25,000 farmers in selected areas. The key objectives were to: improve private sector access to the global fertilizer market; achieve cost reductions through economies-of-scale and other efficiency gains in shipping, handling, storage and inland transport; develop the supply chain for fertilizer and seed, involving importers, blending firms, wholesalers and agro-dealers; create demand among farmers; and develop technology transfer capacity, ensuring that farmers adopt fertilizer and improved seed technologies. Plans have been drawn to continue and extend the program throughout the country.

USAID AAPI Measures Greenhouse Gas Emissions



- Ramzan Ali, a rice farmer in the Barisal district, is very happy with his high paddy yields resulting from FDP technology.
- (Opposite): Entrepreneur Nazma Sultana (left), a successful urea briquette producer in Jessore Sadar *upazila*, is shown with her briquetter and family members who work in her shop.

in Bangladesh

Through a new 'climate-smart' component of the USAID-funded Accelerating Agriculture Productivity Improvement (AAPI) project, IFDC is researching methods to mitigate GHG emissions that result from lowland rice farming in Bangladesh. AAPI will quantify the environmental benefits of FDP technology and build Bangladesh's national capacity to incorporate climate change activities into development programs. The new activity integrates the U.S. government's Global Climate Change Initiative into its Feed the Future (FtF) initiative. Bangladesh is a priority country for both initiatives.

Rice farms account for 85 percent of Bangladesh's agricultural land and emit carbon dioxide, methane and nitrous oxide greenhouse gases. Moreover, inefficient fertilizer use in rice farming increases nitrous oxide and nitric oxide emissions. It is estimated that rice farms are responsible for 9 to 13 percent of global GHG emissions. In addition, runoff of excess nitrogen and phosphorus can severely impact wetland and coastal habitats, and the ineffective management of crops, soils, water and nutrients not only leads to lower yields and inefficient resource use but also results in higher GHG emission rates.

"FDP is likely to significantly reduce GHG emissions, particularly nitrous oxide and nitric oxide emissions, and will further mitigate climate change by substantially reducing ammonia volatilization losses and the nitrification process in the wetlands," said Dr. Upendra Singh, IFDC principal scientist-systems modeling (soil fertility). Most rice farmers broadcast urea (the most common nitrogen-based fertilizer) directly into the floodwater of lowland rice. This results in inefficiencies in nitrogen uptake, with only one-third of the applied nitrogen utilized by the rice crop.

FDP is a simple yet innovative technology that improves the crop uptake efficiency of applied nitrogen. When used on lowland rice, FDP involves the placement of 1-3 grams of fertilizer briquettes at a soil depth of 7-10 centimeters shortly after the rice is transplanted. FDP increases nitrogen use efficiency because most of the fertilizer's nitrogen stays in the soil, close to the plant roots where it is absorbed more effectively. The benefits of the technology are significant – crop yield increases average 20 percent, nitrogen losses decrease approximately 40 percent and 35 percent less fertilizer is used.

"AAPI is expanding FDP technology to over a million hectares (ha) involving 2.5 million farmers," said John Allgood, director of IFDC's EurAsia Division. "Altogether, FDP technology is used on more than 12 percent of Bangladesh's rice-growing land. FDP technology is helping to increase yields and reduce the cost of fertilization. It also helps reduce negative impacts on Bangladesh's ecosystems and thereby contributes to the country's resilience to climate change."

The new project component will determine nitrous oxide and nitric oxide emission rates and the effect of resource-efficient technologies such as FDP on mitigating emissions and improving crop production. IFDC recently designed and constructed GHG chambers that take continuous long-term measurements of the amount of nitrous oxide and nitric oxide released from the soil during rice production and also during the non-rice/fallow period. Given the efficiency of the system and reliability of the results experienced to date during IFDC trials, the chambers can be used across various cropping systems and field conditions in Bangladesh and other countries. Data collection will begin in Bangladesh during the 2013 *Boro* (irrigated) season.

In addition, the project will build the capacity of Bangladeshi agricultural research institutes to measure nitrogen losses and GHG emissions and to develop research programs that address climate change issues. IFDC partners include the Bangladesh Rice Research Institute, Bangladesh Agricultural University and other research universities, the Bangladesh Ministry of Agriculture (MoA), its Department of Agricultural Extension and private sector organizations.

USAID AAPI Project Introduces More Efficient UDP Applicator

▲ Member of Parliament and Honorable Minister of Agriculture Matia Chowdhury (center right) distributes improved UDP applicators to farmers at the AAPI Applicator Distribution Workshop. Ministry of Agriculture Secretary Monzur Hossain (center left); USAID Mission Director to Bangladesh Richard Greene (left); and IFDC Resident Representative Ishrat Jahan (right) also participated in August ceremonies.

Across Bangladesh, 1.7 million farmers are utilizing FDP in the cultivation of 1.2 million ha of crops, primarily rice. The fertilizer technology has been used for years in the country, providing food security for an additional 2.7 million Bangladeshis annually. FDP has also been tested in several other Asian nations and is currently being disseminated to African farmers through a number of IFDC projects.

FDP (or UDP when only urea is applied) is designed to replace the generally inefficient method of broadcasting fertilizer with the point placement of a 1.8-2.7 gram briquette of urea into the soil near the root zone. This one-time application reduces the overall use of urea by 35 percent while increasing crop yields by 20 percent. In the AAPI project area, this translates to an additional 507,000 mt of rice production in 2012. The average incremental value per hectare realized by farmers in 2012 was $193.

The saving for the Government of Bangladesh (GoB) is equally substantial. With the reduction in urea use, the GoB subsidized 74,000 mt less urea during 2012, saving over $29 million in urea subsidies. And with reduced pressure on national fertilizer production, nearly 39 million cubic feet of natural gas was conserved or available for other uses such as electric power.

But even with so many substantiated FDP benefits, one key obstacle remains. Nearly all of the farmers who utilize UDP apply the urea briquettes manually, which is physically strenuous and may require additional labor resources. Farmers who are physically unable to fertilize with this process or are unable to afford seasonal labor simply avoid the technology, regardless of its ultimate benefits. Understanding the challenge, GoB authorities and IFDC are working to champion the development of a more effective applicator that will ease the task of applying UDP in paddy fields.

In recent years, Bangladeshi research institutes and universities have developed several types of applicators

with varying degrees of success. While all of these efforts were considered advancements at the time, none of the models were as easy to operate or accurate enough for widespread adoption, particularly in flooded rice production. To further complicate the issue, as FDP spreads to Africa, specific regions and crop types may well require different applicators, each adapted for use on varying soil types.

IFDC redoubled its efforts in 2012 by instituting a special program to either improve existing designs or to design a new, better-performing applicator. By June, a new injector-type model was undergoing lab and field tests. With multilateral support for the new design, the applicator was unveiled to the public at a workshop at the Bangladesh Agricultural Research Council in August. The light, effective and easy-to-use applicator received praise from GoB and USAID dignitaries.

"I thank IFDC for developing this applicator. It will save time, labor costs and ease farmers' woes to some extent," said Bangladesh Minister of Agriculture Matia Chowdhury, who has been a strong advocate of a more effective UDP applicator in the production of irrigated rice.

During the event, AAPI scientists reiterated the benefits to farmers, who can easily control the applicator to apply briquettes 7.0 to 7.5 centimeters beneath the surface soil in the paddy field. "Farmers do not need to bend down while using the technology, which will save 15-20 percent of the time currently required to apply the briquettes."

As a special feature of the unveiling, 50 farmers were provided free applicators. Lauding IFDC's role in expanding FDP across Bangladesh, Minister Chowdhury looked further into the future, "to the day when scientists develop an automatic applicator to ensure greater efficiency and save even more time. Farmers of the country have long toiled to feed the nation; scientists serve a crucial role in making these farmers' efforts less difficult by developing new technologies."

Agriculture Secretary Monzur Hossain termed the development of the new applicator a "revolutionary advancement." On the use of UDP in the nation's rice production, he noted that the 35 percent reduction in the use of urea under the technology has meant substantial saving in both subsidy costs and natural gas supplies. "The saved natural gas can be used to generate electricity," Hossain added.

▲ The hand placement of UDP fertilizer briquettes (left) is being replaced by the use of an improved applicator recently introduced to Bangladeshi farmers (right).

▲ A high-level delegation from USAID visited the AAPI project in the Jessore District of Bangladesh. The delegation included Paul Weisenfeld (standing), assistant to the administrator for the USAID Bureau for Food Security, Denise Rollins (seated to Weisenfeld's right), USAID senior deputy assistant administrator for Asia, and to his left, Richard Greene, USAID mission director to Bangladesh, and other officials.

IFDC Resident Representative Ishrat Jahan said that IFDC would continue to improve the applicator. Jahan indicated that a process is underway to incorporate a device with the new applicator so that UDP briquettes can be applied maintaining appropriate spacing in the paddy field.

Terming AAPI "a very effective project," USAID Mission Director Richard Greene said the IFDC project is helping accelerate Bangladesh's economic and agricultural growth by enhancing rice yields, saving fertilizer and cutting rice production costs. "It is also good for the environment," he said.

Parallel efforts continue in SSA, where IFDC projects are leading the development of an applicator designed specifically to penetrate the hard, dry soils found in many regions of the continent. With one of its first grants, the Virtual Fertilizer Research Center (VFRC), IFDC's collaborative technology development institute based in Washington, D.C., is also supervising and funding the development of an automated applicator.

Considering that rice is the staple food crop for more than three billion people – nearly half of the global population – technological advances that improve efficiency and yields while protecting the environment are more critical than ever in advancing global food security.

USAID Administrator Focuses on UDP in World Food Prize Address

▲ Photo courtesy of agwired.com

USAID Administrator Dr. Rajiv Shah was a keynote speaker at the 2012 World Food Prize Borlaug Dialogue. He also participated on the "Partnership and Priorities: Transforming the Global Food Security Agenda" panel, which highlighted the role of partnerships and their importance in confronting hunger challenges.

IFDC works on USAID-funded projects in 12 of the 20 U.S. government's FtF countries. The USAID AAPI project in Bangladesh is building on the successful work that IFDC has done there over the past 35 years. IFDC introduced UDP in Bangladesh and it continues to have a tremendous impact on yields. Shah talked about the success of UDP in Bangladesh:

"I shared the story of our work in Bangladesh, where the deep placement of urea briquettes has helped transform 627,000 hectares of land, leading to the first-ever rice surplus in the country's poorest state. This innovation is as simple as it is effective. Instead of applying urea, a nitrogen fertilizer on the soil – where as much as 70 percent is lost to runoff or the atmosphere – it is compacted into briquettes and buried near plant roots, where it releases nitrogen slowly.

"To help realize this potential around the world, we have fundamentally changed our approach – scaling up investments in cutting-edge research, providing direct institutional support to local universities and institutes and training the next generation of experts.

"Although agricultural technologies – like seeds and fertilizers – represent the core of our research investments, we're expanding our focus on science in other innovative ways."

The late Nobel Laureate Dr. Norman Borlaug, founder of the World Food Prize and former IFDC board member, called improved seeds the "catalyst that ignited the Green Revolution" and mineral fertilizer the "fuel" that powered it. Because of his achievements to blunt hunger, famine and misery around the world, it is said that Borlaug "saved more lives than any other person who has ever lived." His work continues through the World Food Prize.

On the USAID Book Club blog site, Administrator Shah commented on *The Alchemy of Air,* Thomas Hager's book about the Haber-Bosch process. (Hager was IFDC's fifth Travis P. Hignett Memorial Lecturer in 2009.)

"This book…reminds us of the serendipity of scientific inquiry. It's about the **invention of fixed nitrogen fertilizer, a single invention that dramatically improved food production** and helped support the massive population growth that took place over the last 70 years.

"When people think about **fertilizer, 'world changing'** may not be the first phrase that comes to mind. But **fertilizer has made modern life possible. In retrospect, it's one of the most important technological innovations of the 20th century**.

"How countries apply nitrogen-based fertilizer varies. When it is overused, it can have significant negative consequences for local ecosystems. In some countries, like China, they use almost 160 kilograms of fertilizer per hectare. While in the United States, the number was 60 or 70 kilograms per hectare a few years ago.

"And then there are the countries that use virtually no fertilizer. In Sub-Saharan Africa or dry-land South Asia – where most of the world's poor farmers struggle to produce enough food to feed their families – they use about 8 kilograms per hectare.

"Where fertilizer is not used, you see children going to bed hungry every night and an increase in the number of children who are stunted over 30 or 40 years ago. If children don't get adequate nutrition, their brains don't develop; and they can't learn and contribute to society to the extent of their capacity. So the story of **the application of fertilizer and the disparities of that application tell the story of both environmental and human consequences**."

Katalyst II: IFDC Continues Fertilizer Sector Assistance in Bangladesh

▲ Katalyst I and II worked to ensure the availability of fertilizers at the farm-gate for balanced fertilizer application and to facilitate a market-friendly regulatory framework in Bangladesh.

Market Development in the Fertilizer Sector of Bangladesh (Katalyst II) continued the work of the first Katalyst project. It was implemented under the GoB Ministry of Commerce by Swisscontact, GIZ International Services and IFDC.

Katalyst II was jointly funded by the Swiss Agency for Development and Cooperation; United Kingdom Department for International Development; Canadian International Development Agency; and the Embassy of the Kingdom of the Netherlands.

Katalyst I was implemented from January 2010 to September 2011. It was followed by an extension period through August 2012 (Katalyst II). Initially, IFDC conducted an in-depth assessment of the fertilizer market with an emphasis on identifying policy, regulatory and technical barriers that impede sound market development. The extension was approved in order to help strengthen the Bangladesh Fertilizer Association (BFA) through the establishment of an MIS.

BFA is a non-profit trade organization that brings together and represents all sectors of the fertilizer industry, including manufacturers, importers, exporters, supply agencies, distributors and agro-dealers.

A Memorandum of Understanding (MoU) that was signed between IFDC and BFA became effective in December 2011 and remains in force until November 2016. IFDC assisted BFA by designing a preliminary plan for yearly fertilizer demand projections in each of Bangladesh's *upazilas* (government districts). A yearly demand projection is important to BFA so that member agro-dealers order the appropriate fertilizers in the correct amounts and at the right time.

Agriculture, particularly grain production, is the major driving force of the Bangladesh economy. Rice is the country's staple food and accounts for about 77 percent of the total cropped area. Some areas have had success with crop diversification to maize and vegetable production. Also, maize has been particularly important as a livestock feed.

But despite its crucial role in the Bangladesh economy, the agricultural sector is underperforming; actual yields remain at 50 percent of their potential. Soil nutrient levels of phosphorus, potassium, secondary nutrients and micronutrients are being depleted. Improved soil nutrient management, supported by FDP, irrigation and quality seed, is a key component of the GoB's strategy to improve yields on a sustainable basis.

Katalyst II followed a pro-poor, market development approach to promote economic growth. Strengthening and supporting the development of the systems that underpin agricultural development were emphasized. IFDC provided services and expertise to improve market development in the Bangladesh fertilizer sector, with an emphasis on advancing private sector participation in the market. Another project focus was on the fertilizer policy framework and the removal of investment barriers.

To achieve sustainable crop yield growth through soil health and fertility management, Katalyst II worked to: promote correct fertilizer management practices such as FDP; ensure the availability of all fertilizers at the farm level for balanced fertilizer application; and facilitate a market-friendly regulatory framework. IFDC helped to

increase the yields of rice, maize, jute, vegetable and potato crops through educational efforts focused on the effective, efficient and correct use of fertilizer and other agro-inputs.

Katalyst II also provided support to the Soil Resource Development Institute (SRDI) to make available location- and crop-specific fertilizer recommendation data for online use by farmers, through the private information communication technology channels of Grameen Phone and Banglalink. Accomplishments included: shifting from a project- to program-based budget to enable SRDI to sustain its activities; establishing a technical committee at the MoA for soil fertility-related policy action, including fertilizer quality; establishing inter-agency monitoring on soil and fertilizer; and capacity building of SRDI.

As a co-implementer of Katalyst II, IFDC worked with the MoA to facilitate approval of the fertilizer recommendation software program that was funded by the government to sustain the program on a continuous basis. Katalyst earlier signed an MoU with SRDI to disseminate soil fertility-related messages through private mobile telephone operators. This data is also available at SRDI's website. During 2009-2010, 2,666 farmers utilized the online fertilizer recommendation software. However, the number of users declined to 2,167 in 2010-2011.

Two policy papers were prepared during the course of the project: "Use of Digital Technology in Agriculture Extension Systems: Roles of AIS in the Access to Information (A2I) Project and SRDI" and "Capacity Building and Professionalism of BFA."

IFDC and BFA have a common goal – to support Bangladesh's MoA in order to improve the productivity of agriculture on a sustainable basis.

IFDC signed another contract with Swisscontact-Katalyst to act as a co-facilitator for Katalyst, helping to build an investor-friendly organic fertilizer market through an efficient licensing procedure. The objective was to plan, design and implement interventions in strategic areas to: facilitate MoA's initiation of a policy review for organic fertilizer licensing; develop and approve recommendations for policy amendments; and lobby to incorporate recommendations in the policy.

USAID Livestock Support Program in Kyrgyzstan

▲ The owner of one of the Kyrgyz pilot dairy farms that will benefit from the KAED Livestock Support program examines one of his calves.

USAID awarded IFDC a third phase of its Economic Development Fund (EDF) activities in Kyrgyzstan in late September. With an overall goal of improving food security and poverty alleviation, the EDF is a special program that invests in critical agricultural sub-sectors, and is implemented in close cooperation with the Kyrgyz MoA. The purpose of the third phase is to demonstrate how to increase the productivity and profitability of livestock farming by improving feed production and rations, animal care and health and breed quality. Targeted farms will serve as model livestock operations, yielding immediate results and serving as a foundation for the transformation of the livestock sector.

The award provides additional funds, most of which will be used to improve quality assurance in livestock products. The program elements are under final discussion. It is anticipated that the improvements will lead to expanded trade opportunities within the region.

This is the final component of a grant under the EDF to support the Kyrgyz government's efforts to boost agricultural productivity. In spring 2011, USAID awarded IFDC the first phase of the EDF, a program to procure and distribute quality seed to 34,000 farmers. The project succeeded in arranging a voucher system and working through private suppliers to deliver the seed in time for spring planting. The seed helped farmers contribute to the country's food security and produce additional crops valued at $12 million.

The ongoing Agriculture Seed Investment Support component (EDF Phase II), launched a year ago, is providing modern equipment, seed and technical assistance to 14 commercially viable seed farms. The objective is to upgrade their farming and business operations as models for other seed farms and the industry. The improved technologies, capacity building and seed production system upgrades are contributing to the development of a vibrant domestic seed supply system that provides farmers access to high-quality seed needed to support sustainable yield increases.

KAED Distributes Agricultural Machinery in Kyrgyz Republic

▲ A grateful farmer presents a wheat bouquet to Kyrgyz Acting Prime Minister Omurbek Babanov at the agricultural machinery distribution event held August 28 at Government House in Bishkek. Also attending are U.S. Chargé d'Affaires Laura Griesmer (fourth from right) and USAID Mission Director Carey Gordon (second from right).

USAID, in close cooperation with the Government of the Kyrgyz Republic (GoK), is distributing agricultural equipment to 14 selected seed farms across the seven Kyrgyz provinces as part of the EDF Program. EDF is a component of IFDC's KAED Follow-on project. The program is helping build a sustainable seed industry in the country. The participating seed farms are helping meet domestic market needs for high-quality seed and also will expand opportunities for export to regional and international markets.

USAID awarded IFDC the Agricultural Seed Investment Support modification under EDF Phase II, which extended the current KAED project for a third year. This new seed support initiative fits well with the ongoing scope of project work and greatly reinforces the effort to achieve the current project objectives – to improve Kyrgyz farmers' access to essential yield-enhancing agricultural inputs and to enhance food security in the country.

Under KAED's EDF program, 94 agricultural machines (including tractors, plows, disks, internal cultivators, fertilizer spreaders, drills, combine harvesters, potato harvesting machines and seed cleaners) will be delivered to seed farms throughout the Kyrgyz Republic.

The opening ceremony of this distribution event took place in front of Government House in the capital city of Bishkek on August 28. Acting Prime Minister Omurbek Babanov; Minister of Agriculture and Land Reclamation of the Kyrgyz Republic Askarbek Djanybekov; U.S. Chargé d'Affaires Laura Griesmer; and USAID Mission Director Carey Gordon attended the ceremony. Some of the newly acquired agricultural equipment was displayed at the event.

Babanov spoke about the EDF Phase II Program and emphasized the importance of USAID assistance. He said, "The 14 seed farms that this program supports will become a driving force that will propel the agricultural sector in Kyrgyzstan forward."

The program was jointly designed by USAID and the GoK and is being implemented by IFDC and the Kyrgyz MoA.

KAED Follow-on is working to extend the gains achieved under KAED I and II and to accelerate progress in improved food security and increased farmer income. KAED I (2001-2008) began in the Ferghana Valley in southern Kyrgyzstan, and was then implemented in northern Kyrgyzstan. KAED II (2008-2010) encouraged Kyrgyz farmers to adopt practices that would increase food production and improve animal health and rural incomes.

USAID Productive Agriculture Project in Tajikistan Helps Farmers Increase Production and Incomes

The USAID Productive Agriculture Project in Tajikistan has been assisting tomato farmers by teaching them improved crop technologies and linking them to agro-dealers and markets. These photos were taken at a project-sponsored 'Early Tomato Open Field Day' in the Bokhtar district of Khatlon viloyat (province).

(1) Usmonov Bahriddin and Kutiev Muhiddin (first and second from left), owners of tomato demonstration plots, are from the Bokhtar district of Khatlon *viloyat*. They have benefited from working with the USAID project. (2, 4 and 5) Tajik farmers with thriving tomato crops in Tajikistan's Khatlon province. (3) The son of a tomato farmer in Khatlon province with healthy fruit from the early tomato crop.

Fertilizer Sector Challenges in

▲ A fertilizer blending/packaging plant and storage warehouse in Gondora.

▶ (Opposite): Fertilizer is stored at the blending/packaging plant and warehouse in Gondora.

Mozambique

CAADP addresses policy and capacity issues across Africa's agricultural sectors. It represents African leaders' collective vision for agriculture, providing a collaborative platform for nations to clearly define goals for agricultural growth. Through individual Country Investment Plans (CIPs), 34 countries have committed to raise agricultural expenditures to at least 10 percent of national budgets and target six percent annual agricultural growth.

As an extension of this effort, the African Fertilizer and Agribusiness Partnership (AFAP), a collaborative partnership among a number of development institutions (including IFDC), focuses on increasing agriculture market access at the country level. AFAP facilitates the development of sustainable, competitive fertilizer markets that provide smallholder farmers with the incentive and capacity to source and use fertilizer for improved crop production and food security. AFAP also fosters private sector participation and investment in national and regional fertilizer value chains.

To facilitate these efforts to raise food security by encouraging private sector investment, USAID is funding the Fertilizer Country Assessment Studies conducted by IFDC in support of AFAP activities. The purpose of these assessments is to estimate the fertilizer requirements needed to achieve individual country agricultural growth targets and offer policy options to ensure that these levels of fertilizer use are achieved.

The research quantifies current use and future fertilizer requirements for up to 12 countries based on their respective CIPs, while also identifying key constraints and opportunities. The analyses identify policy changes that will reduce fertilizer costs, improve farm productivity through technology improvements and facilitate policy reform. IFDC completed country reports for Ghana, Kenya and Tanzania earlier in 2012.

The most recent country report, the "Mozambique Fertilizer Assessment," utilizes agronomic crop modeling and nutrient removal approaches to make an assessment of the quantity of fertilizer nutrients and products needed to meet crop yield targets.

The results show that fertilizer consumption in Mozambique must rise from the current 51,600 mt used annually to about 300,000 mt in order to meet the agricultural growth targets set in Mozambique's Strategic Plan for Agricultural Sector Development (PEDSA), which is aligned with the CAADP agenda.

The report has major implications for AFAP's efforts to harness and facilitate various efforts geared to country development goals. As noted in the IFDC reports, Ghana, Kenya and Tanzania must nearly double their importation and use of fertilizer over the next three years. In stark contrast to the similarities among those countries, Mozambique's fertilizer use must increase by approximately 500 percent by 2020 to reach its agricultural production targets. The report describes the constraints facing Mozambique in achieving these targets.

Mozambique must contend with a unique set of conditions in its quest to increase productivity by raising fertilizer adoption by smallholder farmers. In the early 1990s, Mozambique achieved peace after decades of civil war that had disrupted rural lives and resulted in significant rural-urban migration. The rebuilding of agricultural sector infrastructure remains a work in progress, with some important strides being made in raising investment in the sector. But virtually no fertilizer is used on the majority of crops (a mere 5,000 mt per year [mtpy]). Tobacco and sugarcane, the nation's most lucrative cash crops, account for 47,000 mtpy, or about 90 percent of all fertilizer consumed.

"The issue, therefore," states the report, "is not just increasing use, but also introducing fertilizer to a majority of farmers who have not had any experience or knowledge of the agronomic aspects or economic benefits of fertilizer. Building a knowledge base through training of value chain participants and implementation of market-friendly targeted programs to introduce fertilizers to resource-poor farmers is an important aspect."

▲ A cargo ship docks at the port of Beira, a gateway for the six nations that border Mozambique.

IFDC and its development partners are currently implementing five projects that are contributing to agricultural intensification and value chain capacity building in Mozambique. But the efforts, as the report states, must be scaled and coordinated with regional programs with neighboring countries. Research and extension services must be strengthened, particularly in an effort to help farmers gain access to updated information on soils and fertilizer recommendations.

"Farmers must be motivated to adopt intensive agricultural practices and fertilizer usage rates that promote maximum economic yield for the crop of interest. The primary incentive will be farmers' access to viable markets that can absorb their excess production. Development of these output markets is crucial, because they produce the economic benefits that allow farmers to increase the use of mineral and organic fertilizers as well as complementary inputs such as improved seed, farm equipment and irrigation."

The report also recognizes the need for substantial improvements in the nation's infrastructure. "Port services and the logistics of moving fertilizers to the hinterland are faced with infrastructural constraints. The shallow Beira port should be upgraded to accommodate larger vessels; the same applies for the warehouse facilities for cargo storage."

The inland transport system – from port warehouses to various destinations – will require increased private sector investment to facilitate the storage, handling and movement of agro-inputs and subsequent outputs, the report notes. "Increased storage facilities will be required both at the port and inland locations, with the expectation that these will mostly be funded by the private sector. Some firms are building warehouses in Mozambique with a regional market perspective in mind; the Beira Corridor and other initiatives have been initiated that require inter-country collaboration to open up inland areas to the sea and reduce costs of inputs and ease access to markets."

The report concludes with a focus on the factors that cut across the entire value chain, including credit constraints faced by domestic businesses and the lack of a fertilizer policy that is needed to regulate the sub-sector. "It is important to facilitate PPPs in order to cushion banks from risks. At the same time, a legal framework that guides the activities of market players, particularly in quality control and harmonization of regional standards, is crucial to setting the stage for private sector investments."

"IFDC and AFAP are confident that Mozambique can build this coalition and achieve the growth necessary to reduce poverty and food insecurity."

– Dr. Joshua Ariga, IFDC scientist-economics

"The findings and challenges outlined in the report may seem daunting," said Dr. Joshua Ariga, IFDC scientist-economics and co-author of the study, "but what we have witnessed over the years is that a committed government, working together with a supportive development community and the private sector, can generate increased investments in agriculture. This can lead to substantial strides in a relatively short period. IFDC and AFAP are confident that Mozambique can build this coalition and achieve the growth necessary to reduce poverty and food insecurity."

GLOBAL TraPs

TRANSDISCIPLINARY PROCESSES FOR SUSTAINABLE PHOSPHORUS MANAGEMENT

Global TraPs 1st World Conference June 18-20, 2013 Beijing, People's Republic of China

The World Conference theme is "Learning from Case Studies – Exploring Policy Options." A key goal of the Conference is to have phosphorus experts and policymakers discuss specific areas for policy intervention to ensure sustainable phosphorus use in the future. The 1st Global TraPs World Conference will include special types of discourses that promote the transition of current practices, foster mutual learning and support decision processes.

The Conference will coincide with the 5th International UNEP Global Platform Nutrient Management Symposium to take advantage of overlapping issues while allowing for project-specific discussions and exchanges.

Prof. Roland Scholz
Co-Leader, Global TraPs
Co-Chair, Conference Organizing Committee
Full professor ETH-Zürich

Dr. Amit Roy
Co-Leader, Global TraPs
Co-Chair, Conference Organizing Committee
President and CEO of IFDC

Prof. Fusuo Zhang
Co-Chair, Conference Organizing Committee
Dean of the College of Resources and Environmental Sciences, China Agricultural University, Beijing

Fraunhofer IFDC

Global Phosphate Industry Seeks Greater Collaboration as SSA Increases Potential as Supplier

In October, *Office Chérifien des Phosphates* (OCP Group), the world's largest phosphate mining company, and the China Petroleum & Chemical Industry Federation (CPCIF) sponsored the inaugural Africa China Phosphate Industry Development Forum in Marrakech, Morocco.

The event brought together more than 100 experts, top officials and business representatives from all facets of the phosphate mining and chemical industries for an industry-oriented forum that brought to the fore discussions on relevant practices, new innovations and future opportunities for development and cooperation, particularly in SSA.

The forum presented industrial innovations and new mining techniques in the phosphate industry, with a focus on Chinese, African and Moroccan collaboration. It was also a showcase for recent technological breakthroughs in the industry. Organizers promoted Chinese and North African development success stories to transfer knowledge and lessons learned to representatives of other parts of Africa that have the potential to develop sustainable and profitable phosphate mining and processing markets.

Dr. Amit Roy, president and CEO of IFDC, moderated two of the three discussion panel sessions – "Upstream – Mining" and "Downstream – Chemicals." Steven J. Van Kauwenbergh, IFDC principal scientist, geologist and leader of the Center's Phosphate Research and Resources Initiative, presented 'Phosphate Mining Development Potential in Africa,' a review of the continent's current situation and opportunities for industrial development.

Van Kauwenbergh's assessment of the continent's potential for mineral output is timely. The last decade has seen a dramatic rise in the concern over how much phosphate remains untapped for commercial use and the viability of alternative methods to mine, process, use and recycle the mineral as traditional resources become more difficult to access.

In 2010, Van Kauwenbergh attempted to directly respond to the question and clarify how much phosphate exists with the IFDC report, *Phosphate Rock Reserves and Resources*, which determined that the purported 'peak phosphate' event of 2034 was off by several hundred years based on current nutrient use. The report was the most accurate assessment of reserves and resources compiled in decades and helped move the global phosphate conversation from 'peak' to discussions on the more responsible use of the finite resource while it remains abundant and easily accessible.

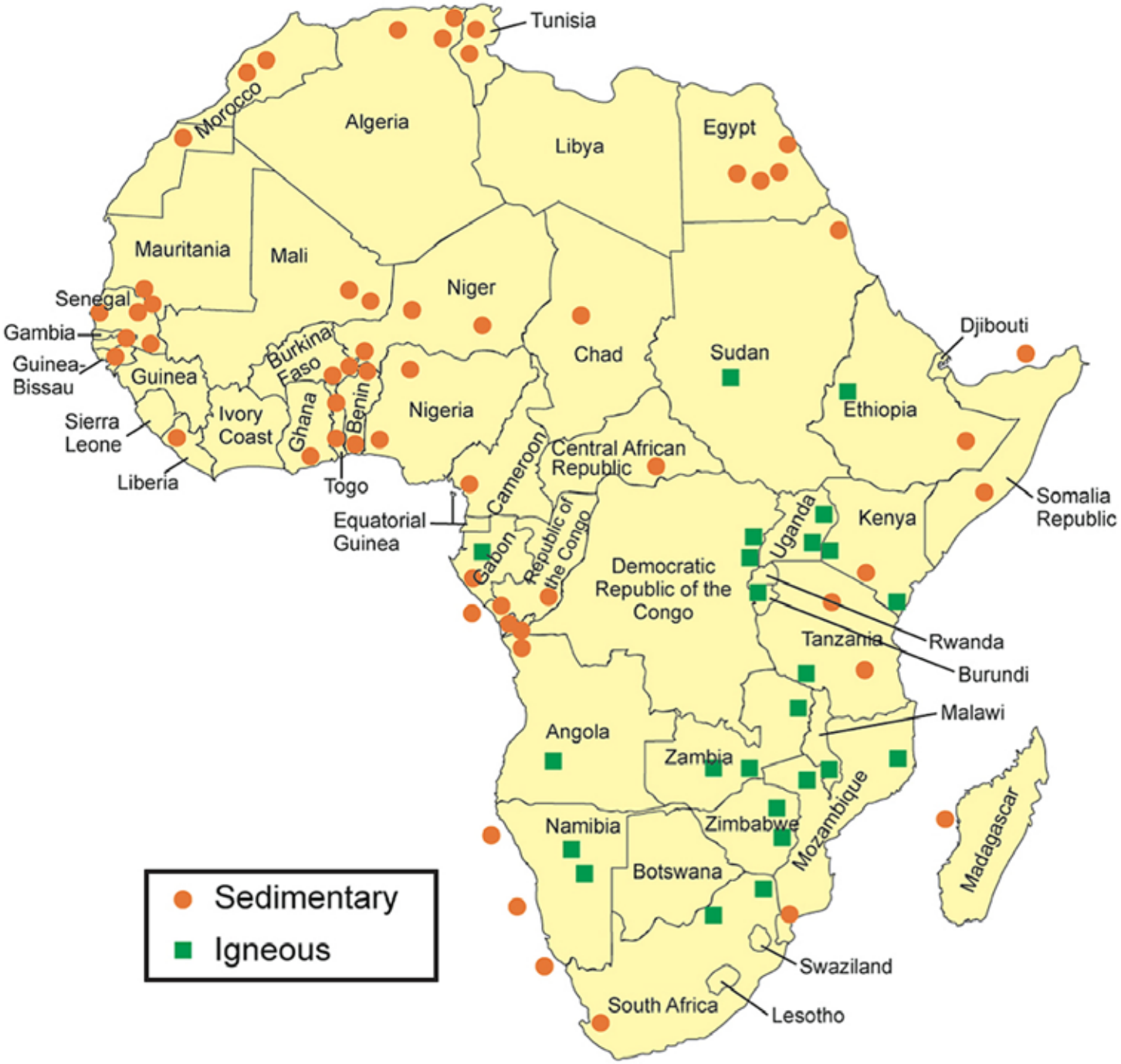
Since its publication, Van Kauwenbergh has been quick to say, "This is a preliminary study based on all publicly accessible data and several other published and unpublished reports." Van Kauwenbergh and Roy have also promoted what IFDC envisions as the next step in this effort to gain greater knowledge – the creation of a collaborative effort among the phosphate industry's leading mining companies, governments and other concerned parties to even more accurately estimate the world's remaining phosphate reserves and resources.

Stakeholders appear to be taking heed. Since the publication of the IFDC report, the Global TraPs project, which studies phosphorus use, management and sustainability, was created. A number of other forums and symposia on the subject have been organized and well-attended by world experts, including the Africa China Phosphate Industry Development Forum.

Moroccan and Chinese leaders stated that they will utilize this inaugural forum as a springboard to the second annual International Symposium on Innovation and Technology in the Phosphate Industry (Symphos), which will be held in Agadir, Morocco, in May 2013.

▲ A phosphate mining operation in Togo.

African Phosphate Deposits



▲ A graphic taken from Steven J. Van Kauwenbergh's presentation, "Phosphate Mining Development Potential in Africa," illustrates the potential that the continent holds as a source for phosphate mining and processing.

Market Information Systems Workshop

▲ Participants and leaders of the workshop in Kenya.

In partnership with the Eastern Africa Grain Council (EAGC), IFDC organized the 'Increasing Agricultural Input and Output Trade through Innovative Market Information Systems (MIS) in Africa' international training. The workshop was held August 27-31 in Nairobi, Kenya, and was attended by 32 participants (including six women) from 14 countries.

Market information is crucial for farmers. It allows them to make informed decisions about crops, planting and harvesting dates, storage and exploiting profitable market opportunities, as well as understand market requirements. Access to reliable market information also assists farmers in planning production to meet market demand and negotiating prices on a more 'equal footing' with wholesalers and retailers. Market information tends to reduce the risks and lower the transaction costs for farmers participating in the market. These efficiency gains can lead to increased participation in markets and greater stability of prices and supply/demand. More efficient and transparent agricultural markets benefit all members of the agricultural value chain and can improve food security.

For more than 35 years IFDC has been actively engaged in implementing projects across the developing world that have contributed to the development of competitive agro-input and output markets in particular and agribusiness in general. MIS has played a major role in IFDC's market development work, providing reliable and timely information to involved stakeholders. In addition to promoting competition, MIS encourages market transparency, which benefits consumers.

Workshop Objectives

As a result of the five-day workshop, participants were expected to:

- Improve their technical knowledge of the design and operation of effective MIS for better market transparency.
- Analyze the MIS impact on trade in agricultural inputs and outputs on national and regional markets.
- Explore the viability of new initiatives to improve the collection, processing and dissemination of market data for agricultural trade and food security.
- Review and apply best practices and lessons learned from well-functioning MIS to country-specific situations in order to reduce market information problems.
- Identify strategies to ensure the sustainability of MIS that meets the commercial needs of traders, agribusinesses and farmers.
- Develop business linkages among MIS stakeholders from different parts of Africa.

Key Topics

The keynote address was given by Ann Mbaabu, director of the AGRA Market Access Program. She emphasized the importance of accurate, timely and reliable information, stating, "A perfect market requires all actors to have equal access to information." She explained that much has been done in the area of ICT and cited examples such as the Regional Agricultural Trade Intelligence Network (RATIN), AMITSA, Kenya Agricultural Commodity Exchange (KACE) and mFarms. Mbaabu stressed that farmers require more information than just prices including where to source agro-inputs, how to use the inputs appropriately, where to get extension messages, etc. She concluded by saying that MIS is now sophisticated and care must be taken to choose the right platform that will benefit decision-making.

Seventeen speakers from the public and private sectors, NGOs, development projects, membership organizations and research institutions spoke at the workshop. The broader topics covered included: MIS theory, best practices and technical options. Specific topics included: MIS trends; MIS in value chains; using MIS to link farmers to markets in commodity clusters; integrating MIS in a broader ecosystem (from farm management to insurance and traceability); MIS at the regional level (AMITSA, MIR Plus, RATIN); MIS at the national level (mFarms Kenya, Esoko Rwanda and Mviwata Tanzania); building MIS as a business model; using partnerships and alliances to strengthen MIS; and why does market transparency matter?

Eight organizations participated in a mini-expo of MIS applications. Exhibitors included: ImageAD, Esoko, mFarms Kenya, Mviwata Tanzania, Esoko Rwanda, FITUganda, EAGC and Syngenta Foundation. Participants also had the opportunity to visit the EAGC offices, learn more about electronic trading platforms and how RATIN benefits from a trading platform.

Closing Remarks

Zakayo Magara, deputy director of agribusiness with Kenya's MoA, gave the closing remarks. He told participants that he had faith in IFDC and EAGC because both institutions work in close collaboration with the Ministry. He added that he was grateful to IFDC for organizing the workshop and urged participants to take advantage of the contacts they had made.

Decision Support Tools Training

▲ Participants in the training program on a field trip to Minjingu Mines & Fertilisers Ltd.

IFDC recently conducted the 'Decision Support Tools for Agricultural Production, Fertilizer Recommendations and Climatic Variability' international training in Arusha, Tanzania. The program attracted 32 participants from 12 countries; 62.5 percent of the participants came from agricultural research centers or were university instructors.

The cost of fertilizers often comprises the largest single component in a smallholder farmer's cost of production, and fertilizer use efficiency on these farms is generally very low. By optimizing crop management, farmers can maximize financial returns while simultaneously improving yield, which offers market opportunities and associated improvements in food security. Soil fertility also is improved and the environment is protected.

IFDC and partner organizations have engaged in research and development activities coupled with extensive field

testing to validate decision support systems (DSS) that can enhance decision-making at the smallholder farm level.

Such systems enable rapid assessment of more effective combinations of locally available nutrient sources and inorganic fertilizers that farmers can apply on a site-specific basis to increase yields and income. These site-specific recommendations are developed within the framework of an assessment of climate variability and the potential for long-term climate change.

The objectives of the seven-day training were to: improve participants' technical knowledge of the role of DSS in increasing agricultural productivity; apply well-tested DSS to reduce agricultural risks caused by climate change and variability; use GIS and modeling tools to collect, analyze and employ soil, weather and market information in systems to generate site- and crop-specific nutrient and crop management recommendations; optimize fertilizer recommendations by integrating weather, soil, management and genetic factors for better allocation of limited resources and greater return on investments; and better predict yields under different scenarios of soil fertility management, climate and soil conditions.

The program's emphasis was on the hands-on practical application of decision support tools such as the Decision Support System for Agrotechnology Transfer (DSSAT), the Phosphate Rock Decision Support System (PRDSS) and the Geospatial Decision Support System for Agrotechnology Transfer (GSSAT). About 80 percent of course time was dedicated to the applications of these tools.

The training also included a field trip to Minjingu Mines & Fertilisers Ltd., which has worked with IFDC for many years. The field visit complemented the training program by linking direct application of phosphate rock to PRDSS.

When asked how they intended to use the DST program in their current jobs, participants said the program will improve their work. The researchers and lecturers responded that the program will sharpen their research on fertilizer recommendations and on climate variability and food security, while the public sector officials pledged to cascade the training to their colleagues in order to improve the agricultural extension work to ensure that farmers benefit.

The training program helped promote IFDC's mission in SSA and DSS tools for agricultural application. Opportunities exist to improve these tools and promote their application through national collaboration with those attending the training and African Soil Information Services. The next Decision Support Tools for Agricultural Production, Fertilizer Recommendations and Climatic Variability training is expected to be held in 2014.

2013 International Training Calendar

Training Program/Workshop/Study Tour	Dates	Location	Program Fee
1. Developing Private Sector Agro-Input Markets: Designing and Implementing Targeted Input Subsidies	April 8-12, 2013	Nairobi, Kenya	$1,300
2. Fertilizer Policy & Marketing Strategies in Africa	May 20-24, 2013	Arusha, Tanzania	$1,300
3. Nitrogen Fertilizer Production Technology (with IFA)	June 24-28, 2013	Sanya, China	$2,700
4. Linking Farmers to Markets in Africa	July 1-5, 2013	Nairobi, Kenya	$1,300
5. Technology Advances in Agricultural Production and Fertilization	August 19-30, 2013	USA (Alabama, Georgia, Illinois, Missouri, Tennessee and Washington, D.C.)	$2,000
6. Phosphate Fertilizer Production Technology (with IFA)	October 7-11, 2013	Bangkok, Thailand	$2,700
7. Developing and Managing Profitable Agro-Input Business Through Sustainable Value Chains	November 4-8, 2013	Ouagadougou, Burkina Faso	$1,300
8. Fertilizer Value Chain – Supply System Management and Servicing Farmers' Needs	December 2-6, 2013	Kuala Lumpur, Malaysia	$1,600

Importance of World Food Day

▲ Members of the League of Women Farmers' Organizations of North Kivu (LOFEPACO) carry *Maracuja* (passion fruit) to their processing facility. IFDC's CATALIST project strengthened the cooperative by training its members in agricultural intensification techniques and facilitating access to credit.

Established by FAO in 1981, World Food Day (October 16) provides an opportunity to highlight solutions to hunger and poverty and achievements in food security and agricultural development. The 2012 theme, "Agricultural cooperatives: key to feeding the world," recognized the role cooperatives, producer organizations and other rural institutions play in improving food security around the world.

IFDC supports World Food Day and is committed to continuing to build and improve agricultural linkages through the development of farmer/producer and agro-dealer groups and cooperatives. "Working with cooperatives allows IFDC to reach thousands of farmers in order to transfer information and technology," said John Wendt, program leader for Natural Resource Management in East and Southern Africa. For example, IFDC's CATALIST project worked with national, provincial and local governments and cooperatives in the Great Lakes Region of Central Africa to provide information on ISFM and best agricultural practices. Over 200,000 farmers in the region adopted IFDC-recommended technologies and agricultural practices. IFDC is now implementing CATALIST-2, which will continue to significantly improve food security in that same region. The project is expected to help 700,000 smallholder farmers increase their incomes by 50 percent; together, they are expected to produce an additional 1.0 mmt of marketable cereal equivalents during the project. Similarly, CATALIST-Uganda is increasing crop productivity and linking farmers to input and output markets by improving value chains.

Across its projects, IFDC emphasizes linking smallholder farmers to markets and promoting trade to increase food security and incomes. IFDC helps strengthen, organize and professionalize farmers and supports growth in agro-input, processing and marketing industries that facilitate the expansion of the entire agribusiness complex.

"We assist smallholder farmers to move from subsistence to commercial farming," said Dr. Amit Roy, IFDC president and CEO. "In addition, IFDC is improving fertilization techniques and developing new, more efficient fertilizer products that increase crop yields while protecting and conserving natural resources."

International Day of Rural Women

IFDC recognizes the critical role that rural women play in agriculture around the world. According to FAO, women produce between 60 and 80 percent of food in most developing countries and about half of the world's food supply. First observed in 2007, the United Nations' International Day of Rural Women (October 15) is an annual opportunity to acknowledge and celebrate the contributions of women to achieving food security and developing rural economies.

Women are often the backbone of local agricultural systems and the sole providers for their families. They are responsible for managing the nutrition of their children and other family members.

"We must realize that the farmer in Africa – especially for small-scale farms – is likely to be a 'she,'" said Margaret Catley-Carlson, patron of the Global Water Partnership (GWP) and member of the IFDC board of directors. "And while *she* and *he* both need good seed and better soil, *she* will probably also need special help with credit, access to information and issues related to land titles."

According to FAO's 2010-11 *The State of Food and Agriculture* report, the number of hungry people could be reduced by 100 to 150 million if rural women had the same access to land, technology, credit, education and markets as men.

"The pressure climate change is exerting on agriculture has exacerbated the challenges women face in securing food, water and fuel for their families in developing countries," said H.E. Rhoda Peace Tumusiime, African Union Commissioner for Rural Economy and Agriculture and member of the IFDC board of directors. "Women's increased vulnerability to climate change stems from the fact that not only do they have unequal access and control of resources as well as decision-making but they are also hindered by social, economic and political barriers. Given the heavy dependence of rural women on natural resources for the household's livelihood, IFDC's work to improve the natural resource base in rural areas is critical for gender equity as it builds women's resilience to climate shocks."

Through its projects and initiatives, IFDC focuses on gender, social and financial equity, female farmer and agro-dealer training, land use rights and policy reform. "For example, IFDC projects trained over 650,000 people in 2011; 32 percent were women," stated Susan van Keulen-Cantella, program leader for Agribusiness in IFDC's North and West Africa Division. "Many women-led businesses have grown into profitable small and medium enterprises, in part through support from IFDC programs that provide training in business and product management to agro-dealers," she continued.

"We must realize that the farmer in Africa – especially for small-scale farms – is likely to be a 'she.'...And while *she* and *he* both need good seed and better soil..."

"*she* will probably also need special help with credit, access to information and issues related to land titles."

– Margaret Catley-Carlson, patron of the Global Water Partnership (GWP) and member of the IFDC board of directors

25 Years in Africa – IFDC Board Members

Since its inception, IFDC has worked to improve agricultural productivity, environmental protection and economic development in Africa. During 2012, the *IFDC Report* has reviewed IFDC's work in Africa, which began in 1976, as well as marking the 25-year anniversary of the Center's first permanent offices in Africa. In this article, members of the IFDC board of directors from Africa are profiled.

Moise Mensah

In early 1976, Moise Christophe Mensah became the first African to be appointed to the IFDC board of directors. At that time, Mensah was vice chairman and executive secretary of the Consultative Group on Food Production and Investment in Developing Countries. Mensah was a native of Dahomey (now known as Benin) and was educated in Benin, Senegal and France. He received a degree as *Ingenieur Agricole* from the *Ecole Nationale de l'Agriculture* (Grignon, France), and a diploma in *Planification et Compatabilite Nationale* from the *Centre d'Etudes Financieres, Economiques et Bancaires* in Paris. From his graduation until 1967, Mensah held positions within the government of Benin. When he joined the IFDC board, he was FAO's regional director stationed in Accra, Ghana. Mensah served on the IFDC board from 1976 to 1978.

Dr. Ibrahim F.I. Shihata

The late Dr. Ibrahim F.I. Shihata served on the IFDC board of directors from 1979 to 1984. He is considered one of the greatest international jurists of the 20th century and was an expert on international development with an unequivocal commitment to the cause of poverty reduction.

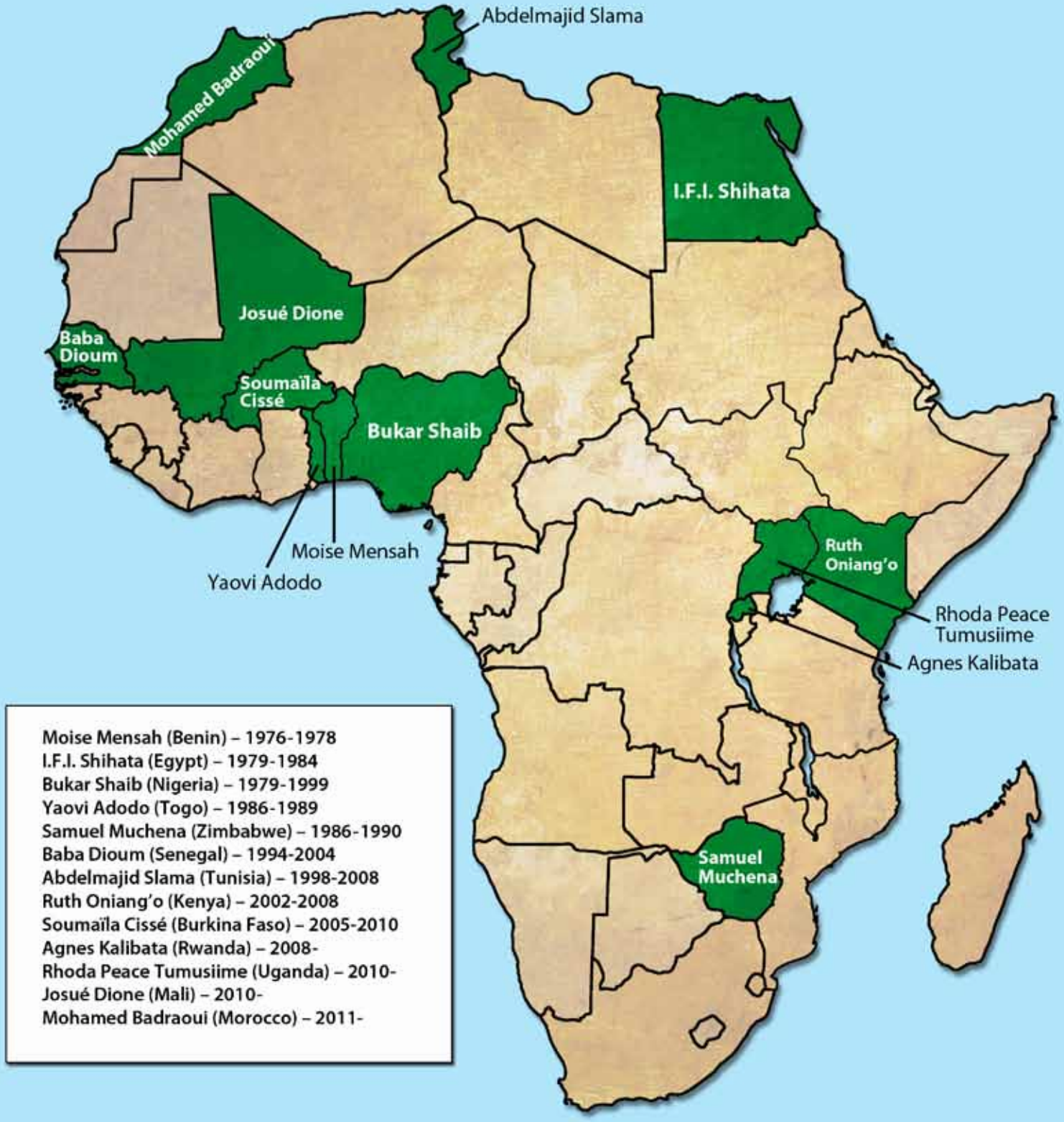
Born in Egypt in 1937, Shihata graduated from Cairo University Law School in 1957 and obtained a doctorate in juridical science from Harvard in 1964. After serving on the law faculty at Cairo's *Ain Shams* University (1964-66), he took up the position of legal advisor and general counsel to the Kuwait Fund for Arab Economic Development. Shihata developed management and diplomatic skills in his exacting roles as the first director-general of the OPEC Fund from its inception in 1976 until July 1983. Simultaneously, he served as a director on the Executive Board of the fledgling International Fund for Agricultural Development (IFAD). It was Shihata's zeal in pursuing the creation of these two institutions that singled him out as an individual committed to creating a better life for the world's poor.

Shihata actively participated in the creation of several international development finance institutions, including the Arab Fund for Economic and Social Development, Arab Bank for Economic Development in Africa, Inter-Arab Investment Guarantee Corporation, Arab Authority for Agricultural Development & Investment, OPEC Fund, IFAD and the Common Fund.

Following his departure from the OPEC Fund in 1983, Shihata served as general counsel for the World Bank. A key achievement was his role in the establishment of the Multilateral Investment Guarantee Agency. He also made a major intellectual contribution to the founding of the Global Environment Facility. He served as secretary-general of the International Center for Settlement of Investment Disputes at a time of unprecedented institutional reform and policy transformation. For years he also directed research through his role as a trustee of the Washington Institute on International and Foreign Trade Law and of the Oxford-based Center of Research on the New International Economic Order. Shihata, who authored almost 30 books and more than 200 essays, retired in 2000 as senior vice president and special advisor to the World Bank's president.

On April 9, 2001, Shihata was awarded the highest academic tribute a scholar can receive. In recognition of his contribution to international finance and development law, a *Liber Amicorum* was presented to him at the World Bank.

IFDC Board Members from Africa



Moise Mensah (Benin) – 1976-1978
I.F.I. Shihata (Egypt) – 1979-1984
Bukar Shaib (Nigeria) – 1979-1999
Yaovi Adodo (Togo) – 1986-1989
Samuel Muchena (Zimbabwe) – 1986-1990
Baba Dioum (Senegal) – 1994-2004
Abdelmajid Slama (Tunisia) – 1998-2008
Ruth Oniang'o (Kenya) – 2002-2008
Soumaïla Cissé (Burkina Faso) – 2005-2010
Agnes Kalibata (Rwanda) – 2008-
Rhoda Peace Tumusiime (Uganda) – 2010-
Josué Dione (Mali) – 2010-
Mohamed Badraoui (Morocco) – 2011-

Dr. Bukar Shaib

The late Dr. Bukar Shaib was from Nigeria's Borno State where he was a highly successful private farmer and Nigeria's first veterinarian. He was educated in veterinary medicine at the University of Ibadan (Nigeria), Liverpool University (England) and the University of Edinburgh (Scotland).

Shaib was a highly respected and prominent technocrat and an opinion leader on agricultural issues in Nigeria and across the developing world. During his career, he served Nigeria in a number of high-profile, key positions, including permanent secretary of the Nigerian Federal Ministry of Agriculture and Water Resources (1968-1978), ambassador to Italy and non-resident ambassador to Portugal and Greece (1979-1980) and special advisor to the President of Nigeria on agriculture and development issues (1980-1983). He was Minister of Agriculture, Water Resources and Rural Development (1984-1989) and served as an advisor to the Minister of Agriculture during the first phase of the NPFS from 2002 to 2007 and also as a member of the board of trustees of NPFS. In addition, he chaired the board of Nigeria's Environmental Protection Agency from 1989 until 2010.

In addition to serving on the IFDC board of directors for 20 years, Shaib was also a member of the board of directors of several national and international agricultural institutions and served as chairman of the board of directors of the International Institute of Tropical Agriculture (IITA) and Independent Chairman of the FAO Council.

Shaib was also a prolific author. Among his most important works were: *Nigeria: National Agricultural Research Strategy Plan (1996-2010); Nigeria: Medium-Term Research Plans (1996-2000); Hope for African Agriculture;* and *Agricultural Development in Nigeria (1973-1985*).

In a 1981 interview published in the *IFDC Report,* Shaib expressed his opinions on the emphasis IFDC should place on its programs. "We in the developing countries lack fertilizer technology," he said. "IFDC has access to worldwide knowledge that is difficult for developing countries to obtain. This fertilizer technology can – and should be – applied to similar situations in different countries."

Yaovi Adodo

At a time when renewed international attention was focused on food production and agricultural development in SSA, African representation on the IFDC board was strengthened. Yaovi Adodo, Togo's Minister of Foreign Affairs and International Cooperation, joined the board in 1986 and served through 1989.

Commenting in 1987 on the importance of IFDC's Africa programs, Adodo said, "The initiatives come at a crucial but most welcome time because for many African countries, agriculture has become the priority of priorities and the driving force for economic development." He further stated, "Technology transfer is the most important aspect of IFDC's programs, and we hope that IFDC-Africa will play a leading role in helping African countries to devise and implement policies to rationally and efficiently use fertilizer resources in the promotion and development of tropical agriculture."

Adodo further stated, "IFDC deserves additional support not only from donors but also from the countries that can and will be the primary beneficiaries of the Africa program of research and training. Based on my experience, I feel that the most effective and lasting form of cooperation is that which is based on mutual respect and understanding between international and national development agencies and that acknowledges the broad cultural diversity of developing nations."

Adodo had a distinguished record of involvement and achievement at national and international levels. In 1977, he was appointed Togo's director of International Cooperation and gained in-depth experience involving development issues in Africa. In 1980, Adodo was given responsibility for technological issues affecting economic development in Togo. Following his appointment as ambassador to the European Economic Community (EEC), Adodo achieved the successful negotiation of the third successive Lomé Convention between the EEC and the African, Caribbean, and Pacific (ACP) countries in 1984, when he represented the interests of 65 ACP countries in trade, price supports and protocols for commodities such as rice and beef.

On completion of the third Lomé Convention, Adodo became Minister of Planning and Industry; subsequently, in 1987 he was appointed as Minister of Foreign Affairs and International Cooperation, a position he held until 1991.

Other key positions he held during his career included ambassador to the Kingdoms of Belgium, the Netherlands and the Grand Duchy of Luxembourg and principal private secretary (*Chef de cabinet*) to the President of the Togolese Republic from 1977 to 1980. Adodo also served as a governor of the World Bank (1984-1987) and of the African Development Bank (1984-1987) and was head of the Togolese delegation at the United Nations General Assembly (1987-1990).

Dr. Samuel C. Muchena

"I bring to the board my experiences in agricultural research and development. Because I understand the constraints to rural development, I hope to make a contribution on fertilizer resource development and use in developing countries." This was how Dr. Samuel C. Muchena expressed his aspirations for future contributions to the IFDC board of directors.

Muchena's appointment in 1990 brought an added breadth of experience in African agriculture to IFDC. When he joined the board, he was deputy secretary for Professional and Technical Services of the Zimbabwe Ministry of Lands, Agriculture and Rural Resettlement. He assisted the Secretary of Agriculture in Zimbabwe with the coordination of the Ministry's technical issues. In that position, he helped translate "research results into rural development." This involved interdepartmental and interministerial as well as private sector coordination. For instance, he helped introduce the production of silk in Zimbabwe. "Knowing that mulberry trees grow very well in my country, I wondered why we couldn't make silk."

To prepare for his career in agriculture, Muchena earned bachelor's and master's degrees in agriculture from Makerere University in Uganda and a doctorate in plant breeding, agronomy and international agriculture from Cornell University (USA).

Muchena designed a breeding program to develop pearl millet and maize varieties adapted to areas of marginal rainfall in Zimbabwe. The dwarf pearl millet variety disseminated in the communal areas was introduced in Zimbabwe and genetically improved by Muchena. The variety was higher yielding and matured earlier than local varieties.

At the Harare Research Station and at the University of Zimbabwe, Muchena worked on crop science and developing high-yielding drought-, pest- and disease-resistant dwarf maize hybrids. The maize hybrids had superior efficiency in water and nutrient utilization and improved agronomic varietal qualities, producing a higher plant population. During his career, Muchena helped to increase food production in Zimbabwe, created employment for his people, increased rural income and provided the means for his country to earn foreign exchange. He served on the IFDC board of directors from 1986 to 1990.

Baba Dioum

Baba Dioum is an environmentalist well-known for the following quotation, which comes from a speech he made in 1968 in New Delhi, India, to the general assembly of the International Union for the Conservation of Nature: "In the end, we will conserve only what we love, we will love only what we understand and we will understand only what we are taught."

Dioum was born in Dahra, Senegal, in 1937. His primary focus was on African environmental issues, including agricultural policy and conservation of land and water. He served as the coordinator general of the Conference of Ministers of Agriculture of West and Central Africa beginning in 1991. Prior to that, he served as director of the Agricultural Policy Unit of Senegal's Ministry of Agriculture, where he was in charge of writing policies on agriculture, and as technical advisor to the Senegal Ministry of Rural Development.

In addition to his decade of service on the IFDC board of directors, Dioum served on the board of the International Food Policy Research Institute (IFPRI) and was the founding member of the Executive Committee for the United Nations Environment Programme, founding member and executive governor of the International Council for Environmental Law and a member of the Executive Committee of the International Union for the Conservation of Nature.

Dioum earned a bachelor's degree in soil science, biology and chemistry from the *Faculte des Sciences de Dakar* in Senegal and a master's degree in forestry from *l'Ecole Nationale des Eaux et Forets de Nancy* in France.

According to Dioum, fundamental changes are required in the way that African economies operate and in the way they are managed. In an interview with the *IFDC Report* during his tenure on the IFDC board, Dioum stated, "These changes are well within the technical and economic capacity of most African nations. We need to

make three critical choices; first, we have to improve the quality of governance, in general, and of agricultural policies, in particular. Second, we have to substantially increase public investment in agriculture to meet the investment needs of an accelerated growth process in that sector. Third, we must set up programs to reach and include the poor and the malnourished."

Dioum had definite ideas regarding IFDC's potential role in helping African nations solve some of their problems. In his *IFDC Report* interview he said, "If we consider that in the developing countries agricultural growth is the engine of the economy, the agricultural resources (particularly soils) have to be capitalized as the focal point in the strategies in these countries. IFDC can be involved not only in transferring technology but also in helping to implement agricultural policies in the developing countries, particularly in Africa. Sustainable development must consider preserving these resources, especially the soils."

Dr. Abdelmajid Slama

Prior to his retirement, Tunisia's Abdelmajid Slama served as the interim executive secretary of the Global Forum on Agricultural Research. He also served as the Managing Director of the Global Mechanism (GM) of the United Nations Convention to Combat Desertification. His responsibilities included supervising all aspects of the operations and activities of the GM to promote the mobilization of resources to support affected developing country parties to implement the Convention.

The majority of Slama's career was with IFAD, where he worked for more than 20 years. When he retired from IFAD in 2004, he had been serving for more than five years (1999-2004) as its director of the Near East, North Africa and Eastern Europe Division. He was responsible for training and capacity building in agricultural research, as well as managing IFAD operations, grants and loans in 22 countries. He also managed several regional technical grants on agricultural research and technology transfer. His areas of expertise included: agriculture and food policy; project analysis; financial, economic, social and institutional analysis of agricultural projects; marketing and price analysis; and the management of agricultural research.

Earlier, he served as director of IFAD's Technical Advisory Division. His responsibilities included directing an interdisciplinary team for the review and technical backstopping of IFAD projects and providing technical information and guidance for the inception and preparation of IFAD missions. He was actively involved in the CGIAR as an IFAD representative and member of the CGIAR Finance Committee. Slama also represented IFAD as a member of the board of trustees of the International Network for Bamboo and Ratan (INBAR) from 1997 to 1999.

He began his career at IFAD in 1983 and served as a country program manager for more than 13 years. He had the lead responsibility for the design and implementation of IFAD lending strategies and programs in Algeria, Djibouti, Lebanon, Morocco, Somalia, Syria and Tunisia.

From 1975 until he went to work for IFAD, Slama was director general of the National Centre for Agricultural Studies in Tunisia. Earlier positions included service as a lecturer and course director at the Economic Development Institute of the World Bank, head of the Economic Analysis Unit of the Agricultural Planning and Economic Analysis Department of Tunisia's Ministry of Agriculture and his first position as an agricultural engineer in the Ministry's Crop Production Department.

Slama earned a bachelor's degree in agricultural engineering and agronomy from the National Agricultural Institute at the University of Tunis and a master's degree in agricultural economics from the University of Minnesota.

Soumaïla Cissé

Soumaïla Cissé joined the IFDC board of directors in October 2004 and served until 2010. He was chairman of UEMOA from 2004 to 2011. Previously, he served as commissioner of UEMOA's Department of Fiscal, Customs and Trade Policies; Minister of Equipment, Land Planning, Environment and Urbanization for the Republic of Mali; Minister of Finance and Trade, Republic of Mali; and secretary general, Office of the President, Republic of Mali.

Born in Timbuctu, Cissé studied at *l'Institut des Sciences de l'Ingénieur de Montpelier* in France to become a software engineer. He worked in several large French companies (IBM-France, le Groupe Pechiney, le Groupe Thomson and the aerospace company Air Inter) before returning to Mali in 1984 to work at the *Compagnie malienne pour le développement des textiles* (CMDT). By 1991, he had risen to be CMDT's acting managing director.

With his formation of the *Alliance pour la démocratie au Mali-Parti africain pour la solidarité et la justice* (Alliance

for democracy in Mali/African Party for solidarity and justice, or ADEMA-PASJ), he became the secretary general of the Presidency of the Republic following the 1992 election. In January 2002, he resigned from the government to devote himself to preparation for the 2002 presidential election, and ADEMA-PASJ selected him as its candidate. Cissé took second place in the first round of the election, but lost in the second round.

Dr. Ruth K. Oniang'o

Dr. Ruth Oniang'o is the founder and executive director of Rural Outreach Programme (ROP), a Kenya-based NGO that supports resource-poor farmer groups engaged in production and agro-processing at the community level. She was a member of the IFDC board of directors from 2002 to 2008 and served as chairperson of the Africa Committee and as a member of the Executive and Program committees. Oniang'o retired early from IFDC's board of directors to devote herself to rebuilding the ROP, which was destroyed during civil unrest in Kenya in 2008. She re-affiliated with IFDC, however, becoming a member of the VFRC board of advisors in 2010 and serves on its Executive Committee.

In 2010, Oniang'o was appointed as the chairperson of the Sasakawa Africa Association (SAA), an international agricultural development NGO. SAA improves the productivity and profitability of smallholder farmers by encouraging the adoption of higher-yielding crop varieties and enhanced production practices.

From 2003 to 2007 Oniang'o served as a member of Kenya's Parliament. She worked to alleviate poverty and hunger, with a special focus on science and technology, agricultural research and productivity, food security, nutrition, bio-safety legislation, use of fertilizer and other inputs, HIV/AIDS and gender issues. During her tenure in Parliament, she also served as Shadow Minister for Education for five years and advocated for educational reforms.

She is also a professor of nutrition at the Great Lakes University of Kisumu (Kenya) and has taught at the University of Nairobi and Jomo Kenyatta University of Agriculture and Technology. She is also an adjunct professor at Tufts University (USA). Her academic career spans more than 20 years, during which she has supervised hundreds of undergraduates and scores of both master's and doctorate graduates in her field. She received bachelor's and master's degrees from Washington State University (USA) and her doctorate from the University of Nairobi.

Oniang'o founded and serves as the editor-in-chief of the *African Journal of Food, Agriculture, Nutrition and Development* (AJFAND), an online peer-reviewed journal. AJFAND is widely viewed as an effective capacity-building initiative.

Oniang'o has done a great deal of consulting, working for example, with the FAO in nutrition. Her areas of research and consulting are household food and nutritional security, women's nutrition, child health and community-level agro-processing, in which she has published widely.

Oniang'o was awarded the Silver Star Medal by the president of the Republic of Kenya in 1995 for outstanding service to the country in community development through action research and the Distinguished Service Medal for national service in 1998. She has served on the board of the Kenya Bureau of Standards, Egerton University Council and Poverty Eradication Commission. She also has served on the board of the Kenya Gatsby Charitable Trust, Food Security and Sustainable Development Division of the Economic Commission for Africa, Institute for Policy Analysis and Research, Biotechnology Advisory Council of Monsanto-USA and the Private Sector Corporate Governance Trust. She is a member of the working group forming the Society of African Journal Editors, a panel member of the World Cancer Research Fund International and founder-president of the Kenya Union of Food Science and Technology. In addition, she has served on the boards of the Bill & Melinda Gates Foundation's Agriculture Strategy Advisory Committee, the International Rice Research Institute (IRRI) and IFPRI.

Oniang'o believes that as long as she is alive and still healthy, she must be a voice for the hungry child; she has said, "One hungry child is one too many; it just is not right." She also believes, "Education is the key to the realization of a happy and fulfilling life."

As she left the IFDC board of directors in 2008, Oniang'o took part in an interview with the *IFDC Report*. Among her comments were:

What changes have you seen at IFDC during your seven years as a board member?

"I have seen IFDC assume a very important position in Africa's agriculture. The governance and culture of the organization have remained uniquely strong."

What do you see as IFDC's role in the future?

"IFDC's future is already here. Its niche is in fertilizer; fertilizer has been taken for granted for years. There has been no new research in many years and no new products have been developed. IFDC should provide leadership in this area because of its expertise. IFDC should spearhead training and research and encourage PPPs that favor development of affordable and environmentally friendly new products."

She added, "Research should focus on products that are energy efficient – both to produce and to use. New fertilizer products should not only be affordable but also compact, to reduce transport costs. This might be achieved by new technology – nanotechnology, a future manufacturing technology that would make fertilizers lighter, cleaner, less expensive and more efficient."

You have resigned from IFDC's board of directors; what are your plans for the future?

"I left the board prematurely to reorganize my NGO and to work more effectively with IFDC to fulfill its mandate. I want to spread good practices throughout East Africa. When I first joined IFDC, I did not know much about fertilizer. As a food and nutrition scientist, I now compare the soil's need for fertilizer to the body's need for nutrients. We cannot be productive without nourishment. Likewise, soils cannot produce without inputs. African farmers do not use enough fertilizer, yet African soils need fertilizer more than anywhere in the world. Working with the rural community over the past 18 years has taught me what poor farmers need – consistent technical support. Our center [ROP] provided many needed veterinary services to about 400 women dairy farmers. Rebuilding the small milk processing plant, which produced yogurt, is essential to those farmers. ROP also helped food crop farmers.

"Recently, a widow explained what ROP had done for her at a community meeting: 'I thank you, ROP, for teaching me how to use inputs. Now my small plot produces eight bags of maize instead of the two that I produced without inputs.'"

Dr. Agnes Kalibata

Dr. Agnes Kalibata joined the IFDC board of directors in 2008. She chairs the board's Africa Committee and is a member of the Executive Committee. Earlier this year she was reappointed as the Minister of Agriculture and Animal Resources (MINAGRI) by Rwanda's President Paul Kagame. "Never change a winning team!" Kagame said during the cabinet swearing-in ceremony.

Since Kalibata's appointment as Minister in 2009, Rwanda has become food secure. The maize, rice and wheat value chains have experienced tremendous progress during her tenure. Under Kalibata's leadership, all 30 districts in Rwanda now produce enough food to meet their needs, and more than half produce enough surplus food to generate income. Rwanda was the first country to sign a CAADP Compact. Rwanda's national budget devoted to agriculture is growing, which is consistent with the country's commitment to CAADP. In recognition of her work heading MINAGRI, Kalibata was awarded the 2012 Yara Prize (please see the article on pages 64-65).

Kalibata previously served as the permanent secretary of MINAGRI and also managed a World Bank project in Rwanda. From 1998 to 2005, she served as a scientist with IITA.

Kalibata completed post-doctoral work at IITA in Kampala, Uganda. She holds a doctorate in entomology from the University of Massachusetts, Amherst (USA). She earned a master's degree in agriculture and a bachelor's degree in entomology and biochemistry from Makerere University in Uganda.

Rhoda Peace Tumusiime

Rhoda Peace Tumusiime became a member of the IFDC board of directors on January 1, 2010, and serves on the board's Africa Committee. In May 2008, she became the Commissioner for Rural Economy and Agriculture with the African Union (and was re-elected and reappointed for a second term in July 2012). At the African Union (AU), Tumusiime works to promote policies and strategies aimed at improving agricultural productivity and growth and enhancing rural development in Africa.

Her portfolio as AU Commissioner covers multiple sectors ranging from crop agriculture, livestock, fisheries, forestry, land, water, environment, climate change, climate services and disaster risk reduction to rural development. She has mobilized and closely worked with other pan-African institutions and development partner agencies in those areas to secure and provide support to AU Member States.

Tumusiime has been particularly involved in the implementation of the four pillars of CAADP: extending the area under land and water management; improving rural infrastructure and trade capacities for market access; increasing the food supply and reducing hunger; and agricultural research, technology dissemination and adoption. Her efforts also have yielded increased responses in the CAADP framework. When she took office, one country had signed a CAADP Compact in the previous four years; 26 more have signed a CAADP Compact in the two years after she took office. She spearheaded the

coordination of Africa's preparations for global climate change negotiations and the formulation of a continent-wide climate change strategy in addition to steering Africa's preparation of the Disaster Risk Reduction Action Plan in line with the global Hugo Framework.

In previous positions, Tumusiime served as Commissioner for Agricultural Planning and Development and Commissioner for Women and Development for the federal government of Uganda, her native country. She was instrumental in developing Uganda's Poverty Eradication Action Plan and a gender mainstreaming policy that has propelled women and girls to greater heights in education and politics. Throughout her career, she has demonstrated leadership and championed causes such as the empowerment of women, poverty eradication, agricultural development, strategic planning and partnership building, among others.

She has chaired high-level committees that address policy issues including trade, agriculture, environment, gender and HIV/AIDS. In addition, Tumusiime has authored several publications on agricultural development, food security, poverty eradication and HIV/AIDS.

Tumusiime earned a bachelor's degree in agricultural economics and a master's degree in economics and planning/managing rural development from the University of Manchester (United Kingdom). She also studied the role of cooperatives in women's development in Turin, Italy. Her expertise, experience and commitment have earned her a number of key positions within regional and international organizations, such as membership in the high-level advisory panel of UNISDR, advisory board of Expo 2015 dedicated to the theme 'Feeding the Planet, Energy for Life,' chair of the African Fertiliser Financing Mechanism and chair of the ALive Platform for livestock development in Africa, among others. During an interview at the 2008 African Green Revolution Conference, Tumusiime stressed the need for a holistic approach to achieve rural development in Africa. "The Green Revolution cannot be achieved unless there is sustainable development," Tumusiime said.

On October 31, 2011, she welcomed delegates to the celebration of the 2011 Africa Food and Nutrition Security Day in Addis Ababa, Ethiopia. The theme of the event was 'Investing in Intra-African Trade for Food and Nutrition Security in Africa.' Tumusiime said, "Investing in intra-African trade, within the CAADP context, is a high-impact intervention needed to enhance agricultural transformation from farm-to-table, and throughout the value chain, to achieve the Millennium Development Goal of halving hunger and poverty by 2015 in Africa."

In June 2012, she participated in several Rio+20 side events. During the event 'Agriculture: The Way Towards Sustainability and Inclusiveness,' Tumusiime advocated for new ways of doing business. "The global investment portfolio in the agriculture sector will have to increase significantly before any meaningful transformation can occur. The private sector engagement and the full participation of non-state actors in the sector are pre-requisites for a sustainable production base," she said.

Dr. Josué Dioné

Dr. Josué Dioné, director of Food Security and Sustainable Development at the United Nations Economic Commission for Africa (UNECA), joined the IFDC board of directors on January 1, 2011. He has more than 30 years of experience working with development policies, strategies and programs that focus on agriculture, food security and sustainable development in Africa. He serves on the board's Africa Committee.

Dioné has worked for UNECA, which is based in Addis Ababa, Ethiopia, since 2001. UNECA promotes the economic and social development of its Member States, fosters intraregional integration and promotes international cooperation for Africa's development.

Dioné has provided strong leadership and enhanced cooperation among UN agencies working on major sustainable development issues in Africa by providing catalytic support for the establishment of inter-agency groups on water (UN Water/Africa), energy (UN Energy/Africa) and biotechnology (UN Biotech/Africa). He also has spearheaded initiatives to build effective partnerships with the AU and the African Development Bank on major continental programs regarding land policy and climate and development.

Prior to joining UNECA, Dioné formulated strategies and policy guidelines as principal policy economist for the African Development Bank. He also coordinated and managed policy research, networking, dialogue and advisory services on agricultural development, food security and poverty reduction in West Africa as regional program coordinator for the *Institut du Sahel* in Bamako, Mali.

A citizen of Mali, Dioné holds doctorate and master's degrees in agricultural economics from Michigan State University (USA) and Université Laval (Canada), respectively.

Dr. Mohamed Badraoui

Dr. Mohamed Badraoui, director general of Morocco's National Agronomic Research Institute (INRA), was elected to a three-year term on the IFDC board of directors, effective January 1, 2012. He serves on the board's Africa Committee.

"Dr. Badraoui is an immense asset to the leadership of IFDC," said Peter McPherson, chair of the IFDC board of directors. "His expertise in soil science and land management will help further the organization's efforts to strengthen sustainable agricultural productivity around the world."

Badraoui has more than 30 years of experience in agricultural research, specializing in soil science. His work has focused on soil fertility management and crop fertilization and fertigation; soil mapping for land management; and soil salinity management under irrigated systems for intensive crop production. He is also experienced in evaluating the sustainability of cropping systems and evaluating and refining agricultural development projects in arid and semi-arid areas.

"I am truly honored to be a part of the IFDC board of directors," said Badraoui. "I look forward to helping guide the organization as it seeks to improve lives through agricultural research."

Badraoui has served as the director general of INRA since 2008. Based in Rabat, Morocco, INRA is a public organization dedicated to improving research for agricultural development. The organization is responsible for increasing the modernization and competitiveness of Morocco's agricultural sector.

Prior to joining INRA, Badraoui was the director of Combating Desertification and Nature Protection for Morocco's High Commission for Waters, Forests and Combating Desertification from 2005 to 2008. He assisted in the implementation of government policies regarding resource conservation and sustainable rural development.

For more than two decades (1981-2005), Badraoui provided training and continuing education for professionals in science and technology as professor of soil sciences at the Institute of Agronomy and Veterinary Medicine Hassan II in Rabat. The institution conducts innovative research and higher education in agriculture, rural development and natural resource management.

Badraoui also is the secretary general of the Morocco National Council on the Environment and a member of the High National Council on Water and Climate. He has been the president of the Moroccan Association of Soil Science since 1992 and was elected as a member of the French Academy of Agriculture in December 2011. A Moroccan citizen, Badraoui holds a bachelor's degree in general agronomy and a master's degree in soil science from IAV Hassan II. He earned a doctorate in soil chemistry, mineralogy and fertility from the University of Minnesota (USA).

First African to Direct IFDC-Africa

Dr. Uzo Mokwunye, a native of Nigeria, became the first African to head IFDC's Africa Division. He served as acting director for several months before being named director on September 1, 1990. Dr. Mokwunye succeeded Dr. Paul L.G. Vlek, the first director of IFDC-Africa. Previously, Dr. Mokwunye held the position of coordinator of Agronomic Research of IFDC-Africa. He joined IFDC in 1980 and was an IFDC employee until 1996.

The Enormity of Africa

Total Area (km²)	
Mainland China:	9,596,961
Continental USA:	9,826,675
Europe:	6,596,552
India:	3,287,263
Japan:	377,915
Vietnam:	331,210
Bangladesh:	143,998
Total:	**30,160,574**
Africa Area:	**30,221,532**

Total Population *(July 2007 est.)*	
China:	1,343,239,923
USA:	313,847,465
Europe:	738,523,843
India:	1,205,073,612
Japan:	127,368,088
Vietnam:	91,519,289
Bangladesh:	161,083,804
Total:	**3,980,656,024**
Africa Population:	**1,123,614,865**

Scale: 1:36,451,458
Albers Equal Area Projection

* **Source: 2011.** *The World Factbook.*

• **Not included in the Europe outline or the area calculation are the countries of Russia and Iceland nor the Svalbard Archipelago and Jan Mayen Island.**

IFDC

IFDC Board Member Dr. Agnes Kalibata Shares 2012

▲ (Left to right): Dr. Agnes Kalibata, Tanzanian President Jakaya Kikwete, Yara International President and CEO Jørgen Ole Haslestad, Dr. Eleni Gabre-Madhin and Kofi Annan, former secretary-general of the United Nations. [Photo courtesy of In2East Africa.]

▶ (Opposite): Dr. Agnes Kalibata and Ben Knapen, Dutch Foreign Affairs Secretary of State.

Yara Prize

Two prominent African leaders were selected to receive the 2012 Yara Prize. Dr. Agnes Kalibata, Minister of Agriculture and Animal Resources in Rwanda, and Dr. Eleni Gabre-Madhin, outgoing CEO of the Ethiopian Commodity Exchange, have performed groundbreaking work in African agriculture. They were each awarded $30,000, a crystal trophy and a certificate of recognition.

According to the Yara International announcement, "Dr. Kalibata is being awarded the prize for her great leadership in the transformation of food security and agricultural development in Rwanda in a relatively short period of time." Kalibata has been a member of the IFDC board of directors since 2008 and has chaired the board's Africa Committee since 2009.

"On behalf of the IFDC board of directors and staff, I congratulate you on winning the 2012 Yara Prize and for your efforts to ensure food security in Rwanda," Dr. Amit Roy, IFDC president and CEO, stated in a letter to Kalibata. "Winning the Prize will provide a great example for others to follow in the pursuit of an African Green Revolution."

Since Kalibata's ministerial appointment in 2009, Rwanda has become food secure. Rwanda's maize, rice and wheat commodity value chains have experienced tremendous progress under Kalibata's leadership. All 30 districts in Rwanda now produce enough food to meet their needs, and more than half produce enough surplus food to generate income. As widely reported earlier this year, over one million Rwandans moved out of poverty between 2005 and 2011.

During Kalibata's tenure as Minister, the percentage of Rwanda's budget devoted to agriculture has grown, which is consistent with the country's commitment to CAADP. Rwanda was the first country to adopt a CAADP Compact.

Yara International President and Chief Executive Officer Jørgen Ole Haslestad commended Kalibata and Gabre-Madhin for "the substantial work they demonstrated in fighting food insecurity, not only in their countries but also on the continent." He continued, "…we salute the champions of sustainable agriculture development. This is the kind of development needed to promote the Grow Africa Initiative." The initiative is co-chaired by Yara, NEPAD and the AU and seeks to link farmers to agro-industries.

In an interview after the announcement with the *New Times*, a Rwandan newspaper, Minister Kalibata noted that winning the prize is attributable to the government policies that were initiated to ensure and promote food security in Rwanda. Among those policies were crop intensification programs to increase productivity, terracing programs to fight erosion, one cow per family incentives and linking farmers to markets.

"Besides working to make Rwandans food secure, we have also led in continental efforts. Our successful participation in CAADP has helped other countries in Africa," Minister Kalibata said. She also noted that Rwanda has been a leader in committing 10 percent of the national budget to the agriculture sector as set forth in the Maputo Declaration.

2012 IFDC Board Meeting

▲ IFDC 2012-2013 board of directors (left to right): Dr. Vo-Tong Xuan (Vietnam), Dr. Mortimer Hugh Neufville (USA), Dr. Jimmy Cheek (USA), Patrick J. Murphy (USA), Board Chairman M. Peter McPherson (USA), Margaret Catley-Carlson (Canada), Vice Chairman Gerard J. Doornbos (Netherlands), Dr. Amit Roy, Dr. John B. Hardman (USA), H.E. Rhoda Peace Tumusiime (Uganda), Vincent McAlister (USA), Dr. Mohamed Badraoui (Morocco), Dr. Stephen Leath (USA), Dr. Josué Dioné (Mali). Not pictured: Dr. Agnes M. Kalibata (Rwanda).

(Left): IFDC board member Patrick Murphy (left) and John Allgood, director of IFDC's EurAsia Division, hold an impromptu discussion during the 2012 board meeting.

(Middle left): After serving on the IFDC board of directors from 2008 to 2012, Dr. Osamu Ito (right), senior research fellow for the United Nations University's Institute for Sustainability and Peace, retired from the board following its 2012 annual meeting. He is speaking with Dr. Joaquin Sanabria, IFDC scientist-biometrician.

(Middle right): From left to right: Rob Groot, director of IFDC's East and Southern Africa Division, and board members H.E. Rhoda Peace Tumusiime, African Union Commissioner for Rural Economy and Agriculture, and Gerard Doornbos, president of the Rijnland District Water Control Board and former president of the International Federation of Agricultural Producers.

(Right): From left to right: IFDC board members Dr. Mortimer Neufville, chairman of the board of ACDI/VOCA; Gerard Doornbos; and Dr. John Hardman, president and CEO of the Carter Center.

IFDC Board of Directors/ VFRC Board of Advisors

IFDC is governed by a board of directors while the VFRC is governed by a board of advisors. Each board has representation from both developed and developing countries. Highlights of recent board member activities include the following:

In October, **Margaret Catley-Carlson**, patron of the Global Water Partnership and chair of the Crop Diversity Trust, participated in the 2012 Borlaug Dialogue during the World Food Prize events in Des Moines, Iowa. Catley-Carlson moderated a panel discussion on 'Droughts and Drylands: Agriculture's Role in Confronting Global Water Challenges.' She also participated in a panel debate hosted by the Centre for Agricultural Bioscience International on 'Access to Knowledge: The Challenge of Supporting Smallholder Farmers.' Catley-Carlson has served on IFDC's board of directors since 2006. She chairs the board's Budget Committee and is a member of the Executive and Audit committees.

Dr. Jimmy Cheek, chancellor of the University of Tennessee, received the Outstanding Alumni Award from the Texas A&M University College of Agriculture and Life Sciences. Cheek earned a bachelor's degree with high honors in agricultural education and a doctorate in interdisciplinary education from Texas A&M. Cheek has been the chairman of the VFRC board of advisors since its creation in 2010 and joined the IFDC board of directors earlier this year. He serves on the board's Nomination Committee.

Dr. Marco Ferroni, executive director of the Syngenta Foundation, has been a speaker and panelist at several recent international conferences, including the McGill University Conference on Global Food Security and the World Food Prize. Ferroni also launched the Foundation's smallholder weather index insurance program in Rwanda, along with Rwandan Minister of Agriculture and Animal Resources **Dr. Agnes Kalibata**. Best known as '*Kilimo Salama*,' this insurance has already proved very popular in Kenya. The *Kilimo Salama* initiative brings together numerous partners, and the Syngenta Foundation remains committed to stimulating more PPPs in agricultural development. As part of this drive, Ferroni and colleagues have recently launched a new platform called AgPartnerXChange (www.apxc.org). Ferroni has been a member of the VFRC board of advisors since 2010 and serves on the Science Committee. Kalibata has been a member of the IFDC board since 2008. She chairs the board's Africa Committee and is a member of the Executive Committee.

Luc Maene, IFA director general, gave the keynote speech at the third annual Gulf Petrochemicals and Chemicals Association fertilizer convention held in September in Dubai, United Arab Emirates. The topic was 'Ensuring Long-Term Sustainability in the Fertilizer Industry.' Maene will retire from IFA, effective December 31, 2012. Maene served as vice chair of the IFDC board of directors, has been a member of the VFRC board of directors since 2010 and serves on its Commercialization Committee.

Prof. Ruth Oniang'o, chairperson of the Sasakawa Africa Association and founder and editor-in-chief of the *African Journal of Food, Agriculture, Nutrition and Development*, participated in a panel discussion during the African Green Revolution Forum (AGRF) in Arusha, Tanzania. The discussion focused on the technological development needed for sustainable agricultural growth. Oniang'o has been a member of the VFRC board of advisors since 2010 and serves on its Executive Committee. She previously served on the IFDC board of directors from 2002 to 2008.

Dr. Renfang Shen, director general of the Institute of Soil Science, Chinese Academy of Sciences, was elected president of the Soil Science Society of China during the 12th National Congress of Soil Science held in August in Chengdu, China. The theme of the congress was 'Facing the Future of Soil Science.' The congress concluded that soil science plays an increasingly important role in improving soil fertility and crop productivity, environmental protection and pollution remediation, preventing degradation of ecosystems and mitigating the effects of global changes in China. Shen has been a member of the VFRC board of advisors since 2010 and serves on its Science Committee.

In October, **Dr. A.K. Singh**, deputy director general of the Natural Resource Management Division of the Indian Council of Agricultural Research, delivered the S.V. Govindarajan Memorial Lecture during a seminar on agricultural land management organized by the Indian Society of Soil Survey and Land Use Planning. The lecture was titled 'Soil Survey - Need for a Paradigm Shift.' Singh also participated in a National Stakeholder Consultation on Climate Change Platform organized by the Central Research Institute for Dryland Agriculture in Hyderabad, India. Singh has been a member of the VFRC board of advisors since 2010.

IFDC Staff News

Patrice Annequin, market information specialist, and **Dr. Kofi Debrah**, chief of party of the USAID West Africa Fertilizer Program, attended the annual AGRF in Arusha, Tanzania. AGRF brought together African heads of state, ministers, farmers, private agribusiness firms, financial institutions, NGOs and scientists to scale up investments and innovation for sustainable agricultural growth and food security. AFAP, an initiative to strengthen the fertilizer value chain in Africa, was launched during the Forum. In addition, mFarms, a market information platform used by IFDC projects, was demonstrated during the event. Visitors to the mFarms exhibition included Tanzanian President Jakaya Kikwete.

In September, **Paul Makepeace**, IFDC senior scientist-marketing and AFAP senior fertilizer specialist, gave a presentation on 'Increasing Fertilizer in Sub-Saharan Africa' at the third annual Gulf Petrochemicals and Chemicals Association fertilizer convention held in September in Dubai, United Arab Emirates. The theme of the convention was 'transforming sustainable development into value creation in the fertilizer industry.'

Scott Mall, chief communications officer, wrote the article "IFDC – 35 Years On," which describes the organization's designation as a public international organization, its key accomplishments and projects and continuing expansion of activities. The article was published in the September/October issue of *Fertilizer Focus*, a bi-monthly journal serving the international fertilizer industry.

Dr. Abdoulaye Mando, leader of the Natural Resources Management Program in IFDC's North and West Africa Division, attended the 10th Scientific and Technical Committee meeting of the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) in October. The objective of CORAF/WECARD is to improve the efficiency and effectiveness of small-scale producers and promote the agribusiness sector.

Dr. Latha Nagarajan, IFDC scientist-economics and Rutgers University research associate, co-wrote the chapter "The Impact of Bt Cotton and the Potential Impact of Biotechnology on Other Crops in China and India," which appeared in the book *Genetically Modified Food and Global Welfare (Frontiers of Economics and Globalization, Volume 10)*. The book received the Quality of Communication Award for 2011-2012 from the Agricultural and Applied Economics Association, the primary scholarly association of the agricultural economics discipline in the United States. Co-authors of the chapter are Carl E. Pray, Jikun Huang, Ruifa Hu and Bharat Ramaswami. In addition, Nagarajan and Hiroyuki Takeshima co-wrote the article "Minor Millets in Tamil Nadu, India: Local Market Participation, On-Farm Diversity and Farmer Welfare," which was published in the October 2012 issue of the journal *Environment and Development Economics*.

Dr. Amit Roy, IFDC president and CEO, was featured in the November 2012 issue of *The Human Factor*, a monthly leadership and human resources magazine based in India. In the interview, Roy discusses the importance of skills development in the agriculture sector. In October, Roy made a presentation on 'Improving Fertilizer Use by Smallholder Farmers in Developing Countries' during the international annual meetings of the American Society of Agronomy, Crop Science Society of America and Soil Science Society of America in Cincinnati, Ohio. He also chaired two discussion sessions during the Africa China Phosphate Industry Development Forum in Marrakech, Morocco. The sessions were titled 'Upstream – Mining' and 'Downstream – Chemicals.' **Steven Van Kauwenbergh**, principal scientist and project leader of IFDC's Phosphate Research and Resources Initiative, presented 'Phosphate Mining Development Potential in Africa.'

IFDC researchers authored the article "Nitrogen Transformation, Ammonia Volatilization Loss and Nitrate Leaching in Organically Enhanced Nitrogen Fertilizers Relative to Urea," published in the *Soil Science Society of America Journal*. Authors include **Dr. Upendra Singh**, principal scientist-systems modeling (soil fertility); **Dr. Joaquin Sanabria**, scientist-biometrician; **Dr. Rick Austin**, coordinator of analytical services; and **Dr. Sampson Agyin-Birikorang**, scientist-systems agronomist. The article evaluates the environmental and food security benefits of new organically enhanced nitrogen fertilizers.

In August, **IFDC's Mozambique office** participated in a cultural exhibition at the U.S. embassy in Maputo, Mozambique. The exhibition featured materials such as publications, brochures and videos from agriculture projects funded by USAID, including the IFDC-implemented AIMS project.

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HUNGER CAN BE SOLVED

2012 International Year of Cooperatives

FAO celebrates World Food Day each year on October 16, the date of FAO's founding in 1945. The theme of World Food Day 2012 was "Agricultural Cooperatives: Key to Feeding the World." For more information, see FAO's World Food Day website: www.fao.org/getinvolved/worldfoodday/en.

COOPERATIVE ENTERPRISES BUILD A BETTER WORLD