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IFDC report

An update on the work and progress of IFDC

CATALIST-2 and CATALIST-Uganda Projects Begin

Cassava+ Assists Smallholder Farmers in Mozambique

AfricaFertilizer.org Improves Fertilizer Statistics

Improving Gender Equity for Women Farmers in Bangladesh

VFRC Moves from Concept to Action

USAID West Africa Fertilizer Program

IFDC

IFDC*report*

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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:
AFAP – African Fertilizer and Agribusiness Partnership • AFO – AfricaFertilizer.org • AGRA – Alliance for a Green Revolution in Africa • CAADP – Comprehensive Africa Agriculture Development Programme • CASE – Competitive Agricultural Systems and Enterprises • CPPs – crop protection products • DGIS – Netherlands' Directorate-General for International Cooperation • ECOWAS – Economic Community of West African States • FAO – Food and Agriculture Organization of the United Nations • FBOs – farmer-based organizations • FDP – Fertilizer Deep Placement • FtF – Feed the Future • ha – hectare • ISFM – Integrated Soil Fertility Management • kg – kilogram • M&E – monitoring and evaluation • MIS – market information system • mmt – million metric tons • mt – metric ton • NGOs – non-governmental organizations • NUE – nutrient use efficiency • PPPs – public-private partnerships • RECs – regional economic communities • SSA – Sub-Saharan Africa • USAID – U.S. Agency for International Development

After successfully completing crop productivity training, farmers in northern Ghana receive fertilizer through a subsidy program.

USAID West Africa Fertilizer Program

The U.S. Agency for International Development's West Africa Fertilizer Program (USAID WAFP) is working to significantly increase food security and reduce poverty and hunger in West Africa. This goal will be accomplished by reducing the cost of fertilizer to increase its use by smallholder farmers, reducing the distance between the farm gate and fertilizer agro-dealers and increasing the use efficiency of fertilizers by accurately matching soil type and crop variety to recommended fertilizer types and quantities. USAID's West Africa Fertilizer Program is a five-year project implemented by IFDC.

The program will have an impact on the Economic Community of West African States (ECOWAS) region; however, country-specific interventions will target the USAID Feed the Future (FtF) focus countries of Ghana, Liberia, Mali and Senegal. The program will increase the regional availability of appropriate and affordable fertilizers through: increased regional supply and distribution of fertilizers by the private sector; increased use of improved fertilizers; improved efficiency of regional market transactions; and an improved enabling environment for fertilizer policy and regulatory framework development.

To accomplish the program goals, IFDC will work closely with a sub-grantee, the African Fertilizer and Agribusiness Partnership (AFAP). AFAP will seek to ease supply-side constraints and ensure a reliable, affordable fertilizer supply in West Africa. The principal operating mechanism for AFAP support will be agribusiness partnership contracts (APCs) under which eligible international, regional or local agribusinesses will agree to perform significant market development activities with local farmers and agribusinesses in exchange for AFAP assistance. This assistance may include management and technical advice, credit guarantees, matching grants (for demonstrations and other demand-creation activities) and in-kind investments.

Additional collaboration in the form of small grants will be developed with local private sector partners, non-governmental organizations (NGOs) and research agencies to ensure full implementation of all proposed activities and sustainable continuation. Across the program, staff members will work to protect the environment and promote gender equity.

Improving West Africa's Agriculture Sector

Agriculture is the main engine of economic growth in West Africa and roughly 65 percent of the population depends on agriculture as its principal livelihood. The agriculture sector contributes 30-40 percent of the region's gross domestic product (GDP) and over 15 percent of regional export earnings. Therefore, the agriculture sector is best positioned to generate rapid and sustained poverty reduction in Africa.

However, sector growth requires substantial increases in agricultural productivity, along with expanded and sustained integration of smallholder farmers into pre- and post-harvest markets. The USAID West Africa Fertilizer Program will help move smallholder farmers from subsistence to commercial agriculture – farming as a business. This will require adequate supplies of affordable fertilizers and seeds for farmers, as well as access to credit, storage facilities and technical advice. In addition, farmers will need adequate linkages to functioning agricultural produce markets.

Increasing fertilizer use is a critical element in raising agricultural production and productivity and in realizing the potential of agribusiness opportunities. West Africa has the lowest rates of fertilizer consumption in the world and the fertilizer distribution chain is hampered by a wide array of constraints.

Increasing Fertilizer Supply and Demand

In the four focus countries, specific value chain interventions will be implemented including: improvement of site- and crop-specific fertilizer recommendations; soil testing and mapping; regional fertilizer trial demonstrations; and capacity strengthening of agro-dealers. Program activities will be coordinated and implemented by a core team in collaboration with local partners through contracts and small grants.

Program activities will target 1,600 agro-dealers, through whom an estimated 25,000 farm households will engage in the application of new agricultural technologies and management practices on 360 technology demonstration fields. In close collaboration with partners and other in-country USAID projects, the technologies will be scaled up to about 37,500 hectares (ha) by the end of the project. Program staff will seek to increase participating farmers' maize and rice yields by at least 65 percent through the use of IFDC's Integrated Soil Fertility Management (ISFM) and Fertilizer Deep Placement (FDP) technologies.

Demand- and supply-side incentives and country- and regional-led development processes will be incorporated. Fertilizer is a commercial product, and demand for fertilizer is driven by the production of a commercial crop (even if at a small scale). Easing supply-side constraints can best be accomplished by expanding fertilizer demand and building markets.

Due to program activities, the volume of fertilizers sold is expected to increase about 10 percent annually in the focus countries. Through an effective market information system (MIS), at least 2,200 participants in the fertilizer supply chain (agro-dealers, importers, blenders and wholesalers) will receive frequent fertilizer market updates to make better informed business decisions.

Public and Private Sector Partnerships Benefit Agriculture

A key program goal is the establishment of a public-private sector West Africa Fertilizer Stakeholders' Forum and the possible formation of a private sector-led West Africa Fertilizer Trade Association. The Forum can link public and private parties involved in the fertilizer sector, while ensuring that effective linkages are made with partners from other input sectors who play important roles in increasing West African agricultural productivity.

Another program goal is the establishment and monitoring of quality standards to decrease the volume of adulterated fertilizer products. To help prevent adulteration, the program will also work to improve fertilizer packaging and labeling so that farmers are provided with choices of fertilizer formulations, package sizes and labels that provide traceability to the point of origin.

New fertilizer importers will receive business management and technical training for more accurate forecasting of market demands and better linkages to global fertilizer markets through multinational suppliers and processors. This will result in an improved fertilizer MIS to monitor supply and demand changes. The USAID West Africa Fertilizer Program will also work to facilitate the establishment of blending facilities for nitrogen, phosphorus and potassium (NPK) fertilizers as well as warehouses for fertilizer storage. Additionally, the project will provide credit guarantees for specific private sector investments that increase fertilizer supplies through a USAID-funded Development Credit Authority (DCA). The DCA will help leverage investments across the fertilizer supply chain, because liquidity is needed from the farm-level through agro-dealers, distributors, manufacturers and importers.

Fertilizer distributors and agro-dealers will receive business management and technical training to improve their understanding of soil and crop fertilizer needs so they can more capably inform farmers about types, quantities and timing of fertilizer application. Field demonstrations will be

▲ Farmers use vouchers to purchase fertilizer in West Africa.

▲ Workers unload fertilizer as part of a subsidy program in northern Ghana.

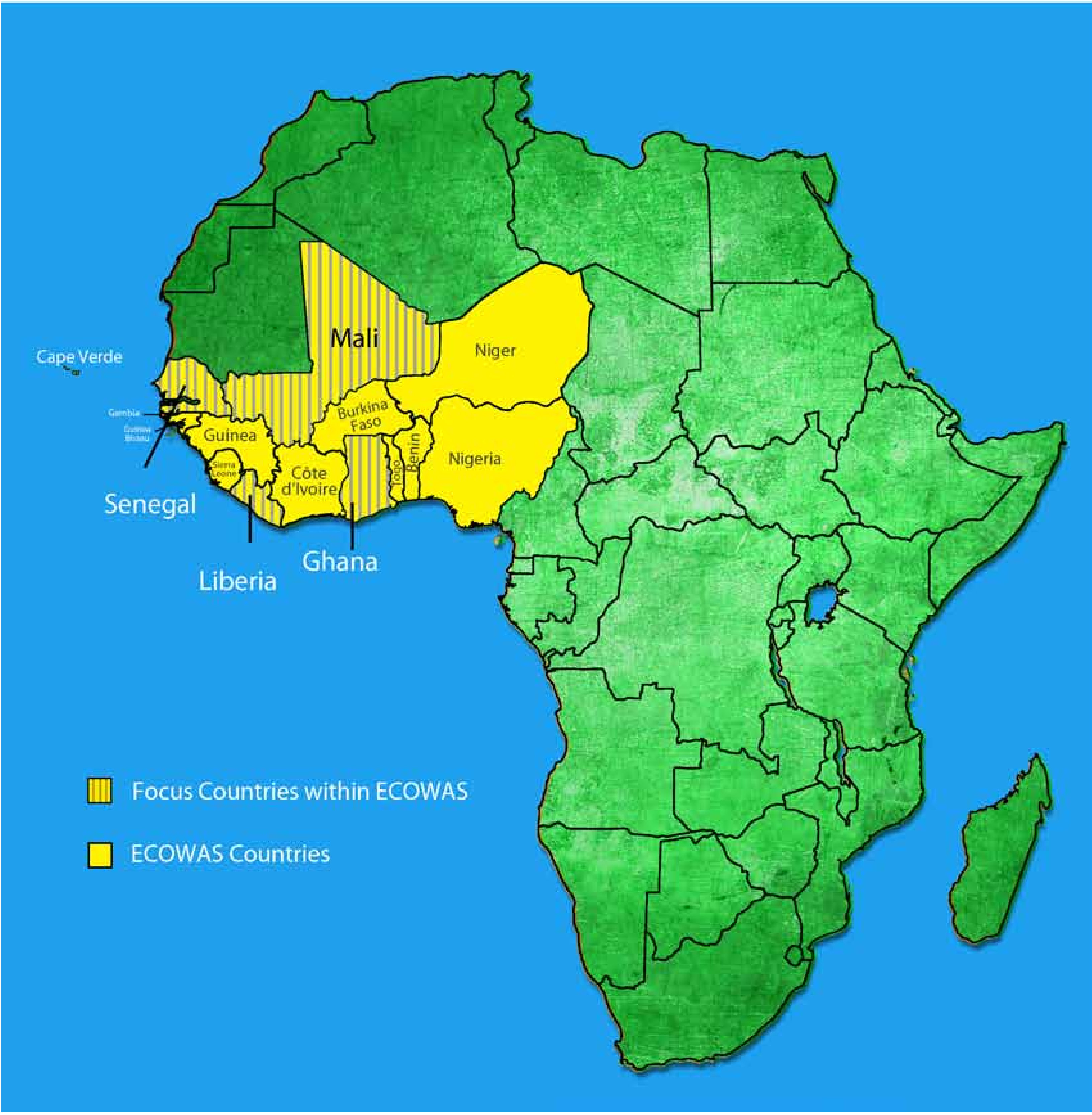
established to better link agro-dealers and farmers and to illustrate possible yield increases and improved financial returns. Improving fertilizer access and affordability for farmers is important, as is improving their bargaining position by increasing their access to information on current market conditions and prices. Additionally, soil mapping and testing will be conducted to ensure that soil fertility levels are incorporated into fertilizer recommendations.

Working with RECs

IFDC will take immediate steps to increase the demand for fertilizer in targeted value chains that can significantly impact food security. This work, relying on IFDC's Competitive Agricultural Systems and Enterprises (CASE) methodology, will be accomplished in collaboration with ongoing projects and will be made more effective when regional fertilizer regulations currently under development by ECOWAS are implemented. IFDC will continue to assist ECOWAS in that effort and will work with other regional economic communities (RECs) on regional and country-based fertilizer regulation implementation as well. Creating the policy conditions in which a competitive and knowledgeable private fertilizer sector is strengthened will stimulate fertilizer demand and supply, thereby increasing food supplies and rural incomes while also reducing poverty.

Finally, studies will be conducted in close coordination with USAID and African institutions to determine the impact of subsidies in West Africa and to facilitate a dialogue with key Fertilizer Forum stakeholders in order to reach a consensus on recommendations and action plans for revisions to existing fertilizer subsidy programs.

West Africa Fertilizer Program



MIR Plus and ECOWAS Use MIS Tools to Increase Access to Information in West Africa

▲ Data collectors test the MIPAD mobile platform at an agro-input shop in Nigeria.

The Marketing Inputs Regionally Plus (MIR Plus) project is strengthening existing and new MIS to improve farmers' access to agro-inputs in West Africa. Implemented by IFDC, MIR Plus is a joint effort by ECOWAS – an REC of 15 West African countries – and the West African Economic and Monetary Union (UEMOA). One of the project's strategic objectives is to improve the availability of technical and market information for farmers and agro-dealers.

"Timely access to market information is critical to empowering farmers to make informed decisions about which agro-inputs to buy and where to buy them," said Dr. Georges Dimithè, MIR Plus project coordinator. "Technical information about agro-inputs also helps agro-dealers provide valuable advice to their farmer-customers."

Since the project began in 2009, MIR Plus has supported the development of the ECOWAS Agricultural Information System (ECOAGRIS) to monitor the implementation of regional agricultural policies. ECOWAS chose the West African Market Information Network (RESIMAO) as the agro-input price platform of ECOAGRIS. RESIMAO is a regional network of national market information systems and provides price information on more than 400 agricultural commodities in 10 countries.

The new RESIMAO platform will...fill an important gap by providing input prices for farmers, agro-dealers and other stakeholders.

– Views of RESIMAO members

MIR Plus is supporting RESIMAO as it develops an updated web-based platform (www.resimao.net) that includes agro-input prices. To be launched by the end of 2012, the new version of RESIMAO will allow users to carry out basic analyses, produce their own graphs and receive prices on their mobile phones. A strategic plan to ensure sustainable operation of the new platform is also in development.

According to Salifou Diarra, chairman of RESIMAO, "The new RESIMAO platform will be a great improvement," echoing the views of RESIMAO members. "It will fill an important gap by providing input prices for farmers, agro-dealers and other stakeholders. The network soon will be extended to all 15 ECOWAS nations."

To facilitate the development of this key building block of ECOAGRIS, MIR Plus supported national partners as they established a network of agro-input price collection points in 10 ECOWAS countries in collaboration with agro-dealer associations and RESIMAO members. MIR Plus and national stakeholders developed a list of products to be monitored, types of agro-input prices gathered and the locations where they would be collected. Enumerators were trained on data collection and distribution. MIR Plus provides technical support to agro-dealers and data collectors to monitor the quality of the information collected and to ensure that at least 90 percent of agro-dealers and enumerators send in data each month.

MIPAD Is Another Tool

Currently, agro-input price data are collected monthly and distributed via e-mail using a spreadsheet. However, this process is time-consuming and difficult due to the lack of reliable Internet connectivity and limited access to computers. To address these challenges, MIR Plus collaborated with IFDC's Ghana Agro-Dealer Development (GADD) project to develop the Market Information Platform for Agro-Dealers (MIPAD). MIPAD is a web-based platform that allows agro-dealers and enumerators to collect and distribute agro-input data using their mobile telephones. The data can be validated and processed on the platform and then disseminated to registered stakeholders on their mobile phones using text messages (called 'short message service' [SMS]). MIPAD also is used to profile agro-dealers by collecting their GPS locations, photographs of their shops and other relevant information.

"More West Africans have access to mobile telephones than to computers or the Internet," said Malick Lompo, MIR Plus market information systems specialist. "The MIPAD mobile phone application allows enumerators to collect and send real-time field data at any time and from anywhere."

MIPAD was successfully tested and fully deployed in Ghana and Nigeria in 2011 and is currently being extended to eight additional ECOWAS countries (Benin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Republic of Guinea, Senegal and Togo).

▲ MIR Plus has developed a mobile telephone application to help dealers to effectively link with other players in the value chain to enhance information flow.

Regional Workshop Helps Regulate the West African Fertilizer Sector

▲ Participating in the ECOWAS and UEMOA regional workshop held May 29-June 1 in Lomé, Togo, were (left to right) ECOWAS Commissioner of Agriculture, Environment and Water Resources, Dr. Marc Atouga; Togo's Minister of Agriculture, Livestock and Fisheries, Kossi M. Ewovor; and Dr. Georges Dimithè, IFDC project coordinator for MIR Plus.

ECOWAS and UEMOA held a regional workshop May 29-June 1 in Lomé, Togo, to discuss and validate two manuals that will complement the legal framework for fertilizer quality control in West Africa. MIR Plus, a joint ECOWAS/UEMOA project implemented by IFDC, provided technical support for the workshop.

The first manual describes the processes and procedures for fertilizer inspection and sampling along the distribution chain. The second manual provides a detailed description of protocols and procedures for the analysis of physical properties (e.g., determination of moisture content, particle size, etc.) and fertilizer nutrient content.

The two manuals will complete a set of five legal instruments for fertilizer quality control in West Africa (three others were validated in 2010). Workshop participants recommended: 1) speeding up the adoption of all validated instruments relating to the quality control of fertilizers; 2) developing an action plan for the effective implementation of such instruments in all Member States; and 3) fostering the dissemination of those instruments for all stakeholders to facilitate their implementation. Participants also discussed the preliminary report of a fertilizer quality study conducted by MIR Plus in five countries (Côte d'Ivoire, Ghana, Nigeria, Senegal and Togo).

In his opening remarks, Togo's Minister of Agriculture, Livestock and Fisheries, Kossi M. Ewovor, stated, "To feed their families and their countries, farmers must be able to shift from extensive-low yield to intensive-high yield agricultural practices through increased use of improved seeds, fertilizers and irrigation." Minister Ewovor urged those in the private sector involved in fertilizer production and distribution to self-organize and self-regulate in order to help authorities minimize the extent of quality control issues. He also encouraged the ECOWAS and UEMOA Commissions to speed up the harmonization processes.

Improving the Fertilizer Market

A 1995 IFDC study on the quality of fertilizers marketed in West Africa showed that 43 percent of the products were nutrient deficient, 58 percent were deficient in weight and counterfeit products were commonly found in the market. A 2010 study conducted by ECOWAS and UEMOA through the MIR Plus project indicated that these problems still persist in West African markets.

Felicia Ansah-Amprofi, deputy director of the Pesticide and Fertilizer Regulatory Division of Ghana's Ministry of Food and Agriculture (MoFA), stated that the manuals are working tools that will level the playing field and improve collaboration among fertilizer sector stakeholders. "The manuals are useful for fertilizer inspectors who will learn how to perform their tasks more efficiently. They are useful for fertilizer dealers who will better understand what is expected from them when inspectors collect samples for analysis. The most crucial aspect is that farmers can be sure that they get what they pay for and receive value for the money they invest," Ansah-Amprofi explained.

Anta Diouf, manufacturing site manager of the fertilizer company *Industries Chimiques du Sénégal* (ICS), encourages such instruments for the region. "We've been using international standards and regulations for fertilizer inspection and analysis at ICS. It is very useful to have regional instruments that address our problems and realities. Such instruments are already available for seeds and pesticides. These new manuals will fill the gap."

The workshop was attended by 52 representatives of national fertilizer inspection and analysis services, producer organizations, private fertilizer companies, national associations of agro-dealers, private laboratories and regional and international organizations.

To feed their families and their countries, farmers must be able to shift from extensive-low yield to intensive-high yield agricultural practices through increased use of improved seeds, fertilizers and irrigation.

– Kossi M. Ewovor, Togo's Minister of Agriculture, Livestock and Fisheries

Benin Non-Cotton Sector Shows How Value Chain Actors Can Partner for Success

▲ Members of an FBO stand outside of an inventory credit storage facility.

For many western and central African countries, cotton is an important export crop. Cotton can generate revenue worth five to 10 percent of a nation's GDP and supports millions of smallholder farmers. As a member of the Cotton-Four (C-4) coalition, the West African nation of Benin is well known for its cotton production. The C-4 (Benin, Burkina Faso, Chad and Mali) collectively account for roughly 15 percent of the world's cotton production.

However, with so much attention given to this valuable cash crop, producers of other high-value crops have not received adequate assistance in their efforts to intensify agricultural production. Seeking to address this issue, IFDC's Improving the Access of Non-Cotton Agricultural Producers in Benin (Benin Non-Cotton) project began in 2009. The Benin Non-Cotton project is increasing high-value crop productivity by what is expected to be 40 percent by project-end, with a 20 percent increase in incomes for 30,000 smallholder farmers. The project focuses on increasing farmer capacities to produce maize, pineapple and rice through improved access to quality agro-inputs, training and enhanced market linkages. Access to credit is also a focal point of the project and the inventory credit system has been used effectively by the project on behalf of participating farmers.

Prior to the implementation of the project, non-cotton farmers were forced to depend on cotton agro-input supply channels due to the lack of credit and disinterest from private marketers to invest in agro-inputs for non-cotton crops. Non-cotton farmers were simply unable to access the specific types and optimal amounts of fertilizers required to increase their productivity.

Inventory Credit System

Establishing the inventory credit system in Benin has provided sufficient guarantees and incentives for the private sector to become involved in the distribution of non-cotton inputs. Farmers can use a portion of the crops they intend to sell as physical collateral against the loans they want to obtain to purchase agro-inputs and other farm supplies. These crops are stored in facilities jointly controlled by farmer-based organizations (FBOs) and the lending institutions. In addition, during non-cultivation periods, pending the availability of inventory credit, they can access additional loans, commonly used by farmers to cover family needs.

The number of farmers participating in the inventory credit system increased from 677 in 2011 to over 4,000 in 2012. The *Fédération des Caisses d'Epargne et de Crédit Agricole Mutuel* (FECECAM) provided input credits in the amount of FCFA 65,429,870 (US $122,681).

While the inventory credit system has many benefits, hurdles remain to its overall success. One such challenge is the potential of some farmers to take on excessive debt. To address this issue, the project has developed a database that helps the FBOs and financial institutions make realistic credit demand estimates based on production objectives and the capacities of each farmer.

A database was established at each FBO's headquarters, which is used to record relevant information on the evolution of farmers' demands and use of inputs, previous credit obtained and areas planted by individual farmers and their organizations collectively over the previous three years. This database is expected to be a sustainable long-term defense against unwise credit requests.

Improving Access to Agro-Inputs

To date, thousands more smallholder farmers have better and more reliable access to fertilizers, improved seeds and crop protection products (CPPs) due to an improved supply chain and more liberal partnerships with credit facilities. Through the project, the number of loans to purchase agro-inputs granted to smallholder farmers increased by 30 percent in 2011, and 96 percent of the loan applications were granted. As a result, the 2012-13 cropping season forecast of land to be planted with non-cotton crops has increased dramatically, from 40 percent to as high as 200 percent in some areas.

Members of the Initiative for the Revival of the Pineapple Sector unload boxes of pineapple juice during an international agro-food fair.

▲ A member of the FBO UNIRIZ-C inspects the group's stock of parboiled rice during one of several international agro-food fairs.

Developing Non-Cotton Markets

In 2011, approximately 615 metric tons (mt) of cereal equivalents (cowpeas, maize and rice) were marketed under the inventory credit system, generating approximately FCFA 50 million ($93,734). Representatives of the Initiative for the Revival of the Pineapple Sector (IRA) and the *Union des Riziculteurs du Centre* (UNIRIZ-C) participate annually in the international agro-food fairs held in Bamako and Ouagadougou, and attend a two-week fair in Cotonou. In 2011, the IRA sold 30 mt of pineapple juice for about FCFA 30 million ($56,239), and UNIRIZ-C sold 10 mt of parboiled and white rice for approximately FCFA 5 million ($9,374).

In addition, the Communal Union of Maize Producers (UCPM) signed a contract with *Societe des Industries Alimentaires* (SOCIA), a large maize mill in the city of Bohicon. The contract called for 839 mt of maize to be delivered in 2011 for FCFA 120 million ($224,993); a provision was also made for the purchase of 3,000 mt of maize in 2012 for approximately FCFA 400 million ($750,010).

Training Builds Capacities

To strengthen all links along the input supply chain, IFDC training programs are tailored to meet different partners' needs and address various issues such as: organizational, financial and institutional management; input needs assessment; business plan development; modern storage practices; development of market prospects; and group buying and collective selling.

The project's targeted approach to training is improving the quality of the crops grown and increasing farmers' incomes. For example, 150 women parboilers of UNIRIZ-C were trained to respond more efficiently to market demands. The group's members learned about the organoleptic quality (the absence of disease or contamination) of the processed rice and various techniques of rice parboiling that will guarantee high yields at shelling. They also learned to use high-capacity parboiling bins to ensure quality consistency. Six craftsmen received IFDC technical support to produce prototypes of large parboiling bins (80 kilogram [kg], 100 kg and 300 kg). In addition, six millers were trained on the use of a rice husker that reduces the rate of broken rice.

In its third year, the Benin Non-Cotton project has introduced new production and marketing systems to Benin's non-cotton sector. The inventory credit system, training programs and related activities have been favorably received by farmers, traders and lending institutions.

The next challenge that the project faces is a lack of storage facilities. To address the issue and protect their investments, many FBOs have included the construction of new storage facilities in the investment timeline of their business plans.

The four-year project, funded by the Embassy of the Kingdom of the Netherlands in Benin, will continue to implement practical and sustainable solutions through mutually beneficial partnerships among farmers, their FBOs, traders and financial institutions.

Ghana Has MDG Success; Focus on Agriculture Must Continue

The United Nations' Millennium Development Goals (MDGs) were established in 2000. Progress toward achieving those goals – particularly MDG1 (eradicate extreme poverty and hunger) – has been disappointing in most developing countries, particularly those in Africa. By contrast, Ghana has shown impressive progress toward this goal.

By 2006, Ghana was the first African nation to have nearly halved the number of people living in extreme poverty, according to the United Nations Development Programme (UNDP). Ghana is also expected to 'graduate' to middle income status and has climbed five spots in UNDP's Human Development Index rankings, which measure development by assessing life expectancy, average level of education and income. According to UNDP, this progress far exceeds that of other developing nations.

Action Aid's 2010 HungerFREE scorecard report – which assessed 28 developing countries on their recognition of food as a human right, investments in agriculture, social protection and steps toward gender equality – recognized Ghana's progress. According to the report, "Ghana cut hunger levels by 75 percent between 1990 and 2004."

Action Aid ranked Ghana first in its efforts toward achieving MDG1 and gave the West African nation a ranking of fifth overall. And though the report evaluated nations on both social and agricultural levels, it affirmed that agricultural investment and intensification are among the most important avenues for reducing poverty and hunger.

Shoppers at the Makola Market in Accra have a wide range of food options.

"Agriculture was estimated to have contributed to poverty reduction four times more than growth in the manufacturing or service sectors," states the Action Aid report. "The biggest impact on reducing hunger and poverty is achieved when governments focus on supporting the small-scale farmers who grow the majority of staple foods consumed locally."

Fertilizer Is a Key Component

Ghana has increased fertilizer imports as a key to intensifying agricultural production. The commitment began in the early 1990s with the liberalization of the fertilizer sector when the government's monopoly on agricultural input imports and distribution ended. Since that time, 10 major importers, between 35 and 50 major distributors and as many as 4,000 fertilizer retailers have entered the fertilizer market with relative ease, according to the World Bank's April 2012 agribusiness indicators report on Ghana.

Increased fertilizer imports and consumption were direct results of the market liberalization. In addition, government fertilizer subsidy plans, the first of which was introduced in 2008, have contributed significantly to increased fertilizer use in Ghana, according to the World Bank. The 2008 subsidy program was based on a voucher system and, although successful in increasing overall fertilizer use, it faced several implementation and adoption issues.

For the 2009-2010 season, the Government of Ghana (GoG) introduced a revised fertilizer subsidy waybill receipt system. The waybill system eliminates vouchers and expands subsidy access to all farmers, regardless of farm size or crops produced. Because of its recent implementation, the program's effectiveness has yet to be determined; a 2012 IFDC study on the Ghana fertilizer market states that the 2010 subsidy program is a significant improvement over the 2008 program, but further refinement is necessary to achieve optimal effects.

36 Years of IFDC Support to Ghana

IFDC has a longstanding development relationship with Ghana. At the IFDC Africa Committee meeting (held in Accra, Ghana, in June), Dr. Emmanuel Krobea Asante, director of National Crop Services for Ghana's MoFA, noted IFDC's 36-year commitment to Ghana's agricultural and economic progress. "IFDC's work in assisting the Ghana Fertilizer Company in 1976 helped prepare it to receive the first shipment of bulk fertilizer at the Port of Tema," said Asante. "The study conducted by IFDC demonstrated the technical and economic potential of bulk shipment through the port, which is still being exploited today."

During his address, Asante lauded IFDC for its continued efforts to help bring food security to Ghana, and pointed to what he considered particularly effective agricultural development projects. "I thank IFDC for the [more than 50] projects that are or have been implemented in Ghana, especially the Africa Fertilizer Efficiency Program, the Ghana Agro-Dealer Development project, the MIR and MIR Plus projects and the Linking Farmers to Markets project, as well as several international training programs held in Ghana," stated Asante. "In the recent past, through MIR Plus, IFDC also helped Ghana to develop a Plant and Fertilizer Act (ACT 803) as well as an action plan for soil fertility improvement," he added.

> **The biggest impact on reducing hunger and poverty is achieved when governments support the small-scale farmers who grow the majority of staple foods consumed locally.**
>
> **– Action Aid 2010 HungerFREE Scorecard Report**

ACT 803, passed by Ghana's Parliament in 2010, was a particularly significant step for the GoG in formalizing its fertilizer policy. Part III of ACT 803 established regulations regarding the registration, manufacture, distribution and quality control of fertilizers, with equally stringent packaging and labeling requirements. ACT 803 also called for the establishment of a National Fertilizer Council and the Ghana Fertilizer Advisory Council, along with a Pesticide and Fertilizer Regulatory Division within the MoFA.

▲ A well-stocked fruit and vegetable stand in Ghana offers nutritious food.

Asante underscored the central role that agriculture plays in improving the livelihoods of the people of Ghana and the importance of maintaining its agriculture and fertilizer strategy. The nation's fertilizer subsidy program is a key element within that strategy. "Due to high rates of soil nutrient depletion and the ensuing degradation of agricultural land, Ghana has subsidized fertilizer at the rate of 49 percent for the past four years. For the first time, in 2013, the government will include improved seed in the subsidy program," Asante announced.

In addition, Asante reiterated the GoG's commitment to encourage and support private sector engagement in the nation's fertilizer value chain. "The government is working to create a policy environment to attract private sector investment in the country's fertilizer sector, especially into local fertilizer production using domestic oil and gas supplies," stated Asante. "The country's current efforts…are geared toward increasing average fertilizer application rates from 10 kilograms per hectare to 20 kilograms per hectare."

But that number will have to more than double again to come close to the 2015 goal of 50 kg/ha set by the *Abuja Declaration* in 2006. To achieve this goal, Asante reaffirmed the GoG's commitment to building the fertilizer supply chain and called on IFDC to work in collaboration with national agricultural research services and the national soil research institute to remap and reclassify Ghanaian soils by zones based on fertility and fertilizer requirements.

Development Challenges Remain

A challenge to expansion of the fertilizer market is a realistic understanding of the market situation without unrealistic goals for fertilizer import, distribution and use. This has been a widespread issue in the growth of Ghana's fertilizer supply chain. As noted previously, an assessment of the nation's fertilizer situation was recently conducted by IFDC as a tool for the continued refinement of GoG policy (see 'Doubling of Fertilizer Use to Reach CAADP Goals' on pages 46-47).

Commissioned by USAID under its FtF initiative, the IFDC 2012 Ghana Fertilizer Assessment, one of as many as 12 country studies that will support AFAP strategies, conducted detailed research into the history of Ghana's fertilizer use. The study also measured Ghana's current fertilizer supply and demand and the increase in use required to meet the country's 2015 agricultural production targets under the Comprehensive Africa Agriculture Development Programme (CAADP).

As part of the CAADP process, Ghana's MoFA articulated its long-term agriculture policy in a Food and Agriculture Sector Development Policy document. Its medium-term (2011-2015) programs are being implemented through an accompanying Medium-Term Agriculture Sector Investment Plan (METASIP), which targets a six percent annual agriculture growth rate and the halving of poverty by 2015 through an allocation of at least 10 percent of the national budget to agriculture. "Achieving such targets," wrote the authors, "will require a focused approach and investments from the public and private sectors."

The goal of the IFDC study was to estimate the fertilizer requirements needed to achieve nationwide investment plan crop production targets and to identify the primary constraints in the supply chain that might hinder the fertilizer flow. The study addressed two primary challenges: estimating the additional quantity of fertilizers required to achieve Ghana's crop production targets; and synthesizing investment and policy changes needed to ensure the flow of such quantities through the supply chain to smallholder farmers.

In determining additional fertilizer requirements, estimates were developed for the METASIP priority food crops (cassava, cowpeas, maize, rice and yams) and all major crops (including the country's lucrative cocoa crop) using available agronomic models and a nutrient uptake analysis. The results indicate that Ghana will need to increase annual fertilizer consumption from an average of 200,000 mt to about 400,000 mt to achieve the targets for priority crops. To support robust production increases in the wider set of crops, the total fertilizer requirement rises to about 520,000 mt annually, representing more than a doubling of fertilizer use over the next few years.

▲ Workers load soybeans for transport to market under IFDC's FtM project.
▶ (Opposite): A market vendor measures flour in Hohoe, a town in the Volta Region.

"These estimates have important implications for the development of each node of the fertilizer value chain," notes the report. "The logistics of moving fertilizer through Ghana's congested ports to local warehouses, and then inland transport to local warehouses, will require major infrastructure investments. While there are some opportunities for increased efficiencies in existing operations, investments in transportation, storage and capacity building will be crucial."

Shoring up the demand side of the chain to reach these goals will also be a challenge. "For farmers to use fertilizers and other relevant inputs, they must have access to sustainable output markets for their surplus production," the report states. "Development of these markets must receive equal attention, as they provide the demand that makes possible the adoption of improved farm-level technologies. The adoption of improved agro-inputs and technologies, including organic fertilizers and appropriate management techniques, in an ISFM framework, is crucial for overall agricultural growth..."

The report asserts that, considering the costs and other constraints associated with Ghana's current fertilizer procurement and distribution system, efforts to identify ways in which the public sector can stimulate private sector investments are needed. Ghanaian officials have echoed that sentiment, and have voiced a commitment to increasing the role of the private sector in its supply chain for both subsidized and unsubsidized fertilizer.

The IFDC fertilizer assessment duly noted the substantial progress made over the last two decades in the fertilizer supply chain and the agriculture sector as a whole. The increased use of fertilizer and the resulting increase in crop outputs are evident in the study, regardless of the challenges that still remain. However, the report warned, "The structure of the current fertilizer distribution system in Ghana contains some rigidity in price determination that does not augur well for private sector investments, particularly in targeting remote areas where traders lack the flexibility to adjust prices to cover costs incurred."

Putting Progress Into Context

The reality of progress, in any context, is that efforts are never truly complete in the attempt to reach a specified goal. With the passing of Ghana's President John Atta Mills in July, the question of the political will to sustain rapid economic progress has arisen. Major Chinese investments have caused experts to question how much of the agricultural production will remain as domestic supplies. Also, the discovery of offshore oil brings a new dynamic to Ghana's economy.

Some experts also pose the question of parity in light of economic progress. Although the national poverty rate is now 28.5 percent, over seven million people still live on less than $2 per day. According to the International Fund for Agricultural Development (IFAD), poverty rates in remote rural areas remain as high as 40 percent.

▲ A farmer poses at a livestock market in Accra.

The nation's sheer force of will to pull the majority of its people out of poverty over the last 20 years is what makes Ghana one of the most cited examples in the context of MDG1. But such progress is fragile. Progress can slow if commitments wane – and the fate of every Ghanaian must be considered, especially the rural smallholder farmers who are likely to feel the effects of progress much later than the nation's more fortunate citizens.

> **For farmers to use fertilizers and other relevant inputs, they must have access to sustainable output markets for their surplus production.**
>
> **– Action Aid 2010 HungerFREE Scorecard Report**

Current/Recent IFDC Projects to Increase Food Security in Ghana

Agricultural Value Chain Mentorship Project (AVCMP), 2011-2014

AVCMP is strengthening the capacity of agro-dealers, small and medium enterprises (SMEs) and FBOs in Northern Ghana; 34,000 farmers and 680 FBOs are targeted. IFDC's role is to increase maize, rice and soybean farmers' access to output markets by building the entrepreneurial and technical capacity of SMEs.

Partners: Ghana Agricultural Associations Business and Information Center (GAABIC) and the Savanna Agricultural Research Institute (SARI)

Donors: Alliance for a Green Revolution in Africa (AGRA) and the Danish International Development Agency

Ghana Agro-Dealer Development Project (GADD), 2008-2012

GADD, which ended in March 2012, strengthened access to improved agricultural technologies and practices, particularly modern inputs. Key activities included agro-dealer capacity building, institutional strengthening, technology transfer and facilitating access to credit. Nearly 2,400 agro-dealers were trained and certified, and more than 30,000 farmers were exposed to improved technologies via 273 technology transfer demonstration plots and 620 field days and exhibitions.

Partner: GAABIC

Donor: AGRA

Linking Farmers to Markets (FtM), 2010-2013

FtM is helping farmers of staple crops sell their produce (maize, rice, sorghum and soybeans) to large industrial buyers, ultimately increasing 50,000 farmers' incomes by 15 to 20 percent.

Partner: Savanna Farmers Marketing Company Ltd.

Donor: AGRA

Mainstreaming Pro-Poor Fertilizer Access and Innovative Practices in West Africa, 2010-2013

The project is improving the livelihoods of smallholder farmers in Burkina Faso, Ghana and Togo through improved land husbandry and better access to, and more efficient use of, fertilizer. This includes the development and extension of site-specific ISFM options and appropriate fertilizer recommendations.

Partners: National Agricultural Research and Extension Systems (NARES), NGOs and IFAD

Donor: IFAD

Marketing Inputs Regionally (MIR Plus), 2009-2013

MIR Plus is facilitating the development of regional agro-input markets and common regional agricultural policies in West Africa. The project is linking 2.23 million farmers to agro-dealers who will help train and supply the farmers with agro-inputs.

Partners: ECOWAS and UEMOA

Donors: ECOWAS, UEMOA and the Netherlands' Directorate-General for International Cooperation (DGIS)

Millennium Development Authority (MiDA) Commercial Development of Farmer-Based Organizations (CDFO), 2008-2011

CDFO trained more than 450 FBOs involving nearly 22,000 farmers in agricultural technology and new farming methods in northern Ghana. The project was a component of the Agriculture Project of the Millennium Challenge Corporation (MCC) Compact (managed by MiDA).

Partners: Adventist Development and Relief Agency and Agricultural Cooperative Development International/ Volunteers in Overseas Cooperative Assistance (ACDI/VOCA)

Donor: MCC

NEPAD-FAO Fertilizer Subsidy Study, 2011-2012

The New Partnership for Africa's Development (NEPAD's) Planning and Coordinating Agency (NPCA) commissioned a study on fertilizer subsidy programs in eight countries in Africa, with technical guidance and financial support provided by the Food and Agriculture Organization (FAO) of the United Nations, AGRA and IFDC. The study is an overview of different subsidy models, providing options for countries considering subsidies or wanting to alter current subsidy programs.

Partner: NPCA

Donors: FAO and AGRA

Toward Sustainable Clusters in Agribusiness through Learning in Entrepreneurship (2SCALE), 2012-2016

2SCALE will improve rural livelihoods, nutrition and food security in Benin, Ethiopia, Ghana, Kenya, Mali, Mozambique, Nigeria, South Sudan and Uganda, with 1.15 million smallholder families ultimately increasing their productivity by 100 percent and their net incomes by 30 percent. A key component will be the development of a portfolio of 500 robust and viable agribusiness clusters and value chains to supply food to regional, national and local markets and the least fortunate, also known as base-of-the-pyramid consumers.

Partners: International Centre for development oriented Research in Agriculture, Base of the Pyramid Innovation Center and international agro-food companies

Donor: DGIS

USAID West Africa Fertilizer Program (USAID WAFP), 2012-2016

USAID WAFP seeks to increase food security and reduce poverty and hunger in West Africa by reducing the cost of fertilizer and increasing its use, reducing the distance between the farm gate and agro-dealers and increasing the efficiency of fertilizer use through accurate fertilizer recommendations. While the program will have a regional focus, country-specific interventions will be implemented in Ghana, Liberia, Mali and Senegal. Activities will target 1,600 agro-dealers, who will provide an estimated 30,000 farmers with access to new agricultural technologies.

Partner: AFAP

Donor: USAID/WA

Ghana at a Glance

Location: Western Africa, between Côte d'Ivoire and Togo

Total Land Area: 238,533 sq km

Comparable Area: Similar in size to the U.S. state of Oregon and/or Romania

Cultivated Land: 17.54 percent

Climate: Warm/dry along the coast; hot/humid in the southwest; hot/dry in the north

Freshwater Use: 66 percent used in agriculture

Agricultural Products by Volume: Cocoa, rice, cassava, peanuts, maize, shea nuts, bananas

Population: 25,241,998

Per Capita Income: US $1,230

Agricultural Labor as Percentage of Total Labor Force: 56 percent

Those Living Below the Poverty Line: 28.5 percent

AfricaFertilizer.org

A Tool to Help Fuel the African Green Revolution

AfricaFertilizer.org and Partners Improve Fertilizer Statistics in Africa

AfricaFertilizer.org (AFO) is improving the availability and quality of fertilizer statistics in Africa through a partnership with CountrySTAT, an initiative of FAO. CountrySTAT is a web-based information technology system that monitors food and agriculture statistics in 21 Sub-Saharan countries. Additional AFO partners include the International Fertilizer Industry Association (IFA), African Union Commission, AGRA, NEPAD and AFAP.

AFO is an IFDC-initiated and -managed web portal to disseminate and exchange data on fertilizer and soil fertility issues in Africa. One primary focus of the initiative is to make available essential fertilizer statistics such as data on production, trade, consumption, price and fertilizer use per crop.

"Fertilizer statistics are often inaccurate, outdated or simply not available in most Sub-Saharan countries," noted Patrice Annequin, IFDC market information specialist. "Until AFO was launched, there wasn't a systematic process for the collection, collation and presentation of this data. From 2012 to 2015, AfricaFertilizer.org and its partners are shifting focus from aggregating and disseminating existing information on fertilizers to supporting partners, programs and activities that increase the availability and quality of such information."

AFO Assists CountrySTAT

AFO is assisting the CountrySTAT program to improve the collection of fertilizer statistics. Earlier this year, AFO developed the 'Training Manual on Fertilizer Statistics for Africa' to be used by CountrySTAT and AFO trainers. The manual includes an overview of the fertilizer market in Africa, basic information about fertilizers, descriptions of hard data (such as fertilizer production and consumption statistics) and descriptions of soft data (such as fertilizer policy and marketing information).

In March 2012, AFO organized a fertilizer statistics 'training-of-trainers' program in Nairobi, Kenya. Members of CountrySTAT Secretariats were trained to become trainers of newly created Fertilizer Technical Working Groups. "The Fertilizer Technical Working Groups are key to the process of improving fertilizer statistics," said Annequin. "The national groups meet four times a year to review and process raw data and then submit it to the Africa Fertilizer Working Group for validation." The Africa Fertilizer Working Group is made up of representatives of FAO, IFA and IFDC.

In April, participants of an AFO fertilizer statistics training session in Ghana formed the core members of the first Fertilizer Technical Working Sub-Group, part of the existing CountrySTAT working group in Ghana. With members from the private sector, the government's customs agency and IFDC, the group has been very active and is already sharing data and statistics, including the submission of a fully documented survey to NEPAD on Ghana's implementation of the *Abuja Declaration on Fertilizers for an African Green Revolution*.

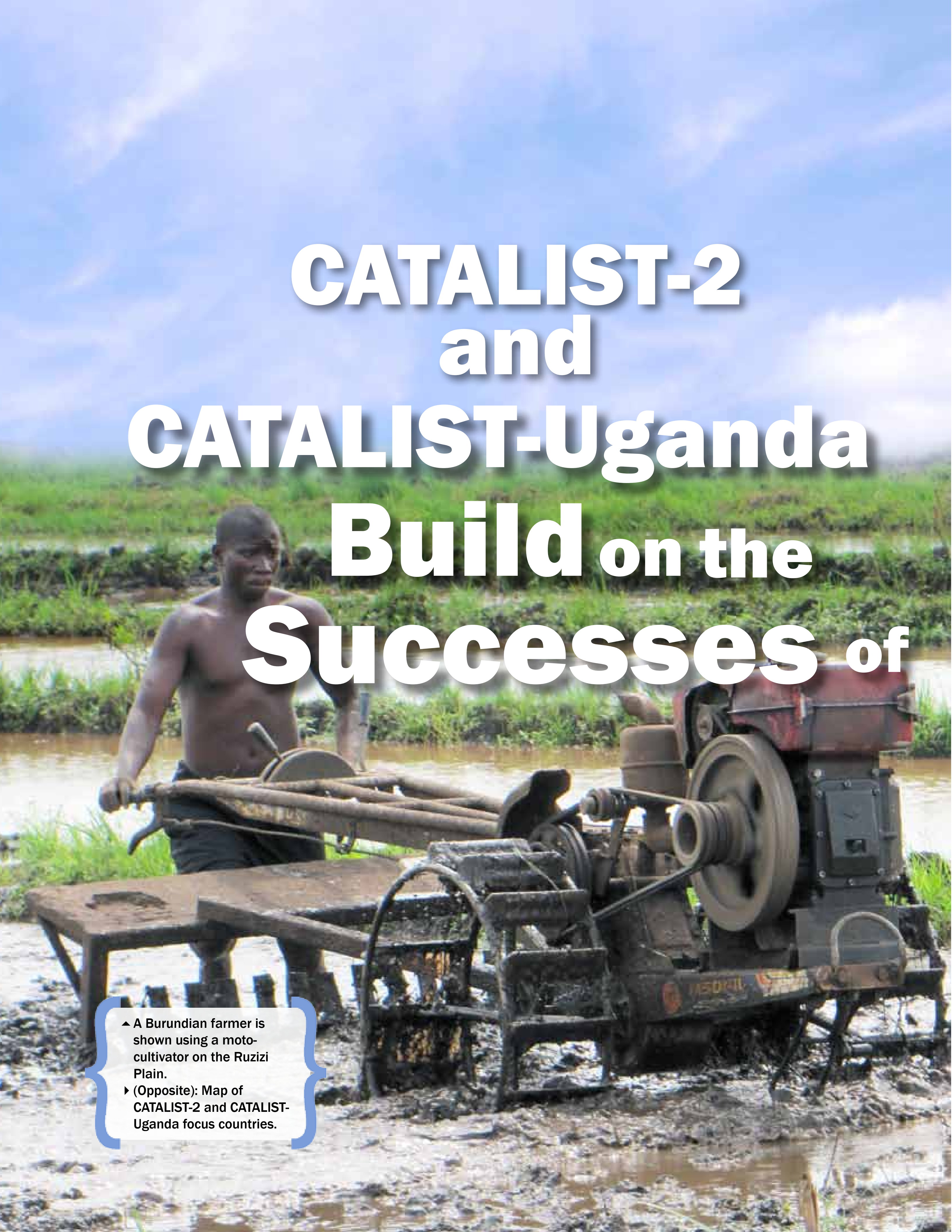
Additional AFO training sessions were held in June and July, with 90 participants representing Burkina Faso, Burundi, Côte d'Ivoire, Ghana, Kenya, Mali, Mozambique, Niger, Rwanda, Tanzania and Uganda. These 11 countries account for more than 60 percent of the fertilizers used in Sub-Saharan Africa (SSA).

Launched by IFDC in 2010, AFO was created as a response to Article 10 of the *Abuja Declaration*, which advocated for farmers' improved access to inputs and practices that are complementary to increased fertilizer use (market information, quality seeds, irrigation facilities and extension services). AFO sources, aggregates, filters and shares information on fertilizer through a web-based data center. In addition to fertilizer statistics, market news, publications and directories, new features include detailed country pages and access to selected national surveys submitted to NEPAD on progress implementing the *Abuja Declaration*. The portal is available at www.africafertilizer.org.

Until AFO was launched, there wasn't a systematic process for the collection, collation and presentation of fertilizer statistics.

– Patrice Annequin, IFDC market information specialist

CATALIST-2 and CATALIST-Uganda Build on the Successes of



▲ A Burundian farmer is shown using a moto-cultivator on the Ruzizi Plain.

▶ (Opposite): Map of CATALIST-2 and CATALIST-Uganda focus countries.

Two new IFDC projects build on the successes of the recently completed Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability (CATALIST) project. CATALIST was a five-and-one-half year agricultural intensification project in Burundi, the North and South Kivu provinces of the Democratic Republic of Congo (DRC) and Rwanda. CATALIST-2 will build on the CATALIST successes in those same countries, while CATALIST-Uganda will take CATALIST concepts and adapt them to Uganda. Both projects are funded by DGIS through the Embassies of the Kingdom of the Netherlands in the respective countries and began operations on July 1.

CATALIST Project

CATALIST initially focused on the introduction of ISFM, a set of agricultural practices adapted to local conditions to maximize the efficiency of crop nutrient use and to improve agricultural productivity. ISFM includes the use of mineral fertilizers, soil amendments (such as lime and phosphate rock), locally available organic matter (crop residues, compost and livestock and farm yard manure), improved germplasm, agroforestry and the use of crop rotation and/or intercropping with legumes to replenish lost soil nutrients. IFDC's introduction of ISFM in Central Africa's Great Lakes Region (CAGLR) led to two- to four-fold increases in crop production, reductions in production costs and dramatic increases in marketable surpluses and farm incomes for 250,000 farm families.

In 2009 CATALIST project staff introduced IFDC's CASE approach in the CAGLR. CASE is based on agribusiness cluster formation and the strengthening of public and private institutions' abilities to enable agribusiness and trade. The process of agribusiness cluster formation coordinates various stakeholders at the grassroots level, including smallholder farmers, agro-dealers, local entrepreneurs, traders, financial institutions, research and extension services and MIS. CASE strengthens farmers' capacities at all levels, giving them the knowledge and tools they need to increase the amount and quality of their crops and then links them to profitable markets so that they can sell their produce at a profit.

CATALIST-2

CATALIST-2 will continue to expand CATALIST in the CAGLR. The project is being implemented by IFDC with the assistance of the Wageningen University Research Centre for Development Innovation (WUR-CDI). WUR-CDI will establish systems to increase the availability of improved germplasm, which is vital to the process of improving yields and product quality.

The project's goals are to improve the livelihoods of smallholder farmers and others in the agricultural value chain and promote regional trade and business linkages, which will support peace and stability in the Great Lakes Region. The project's overall objective is to significantly improve food security in the CAGLR. When the project ends, 700,000 smallholder farmers will have seen their incomes increase by 50 percent; together, they will have produced an additional

Young boys play on a platform built over a CATALIST-assisted maize field. Because of the use of fertilizer and other agricultural technologies, the maize is healthier and more abundant than maize grown in previous seasons.

1.0 million metric tons (mmt) of marketable cereal equivalents, contributing to food security in the region.

The project will 'roll out and scale up' – increasing the number of agribusiness clusters and the relationships among them. Using the 'market' as the key driver for agricultural intensification, CATALIST-2 will maximize scarce development resources through the use of public-private partnerships (PPPs) and will partner – whenever possible – with national and international agro-enterprises in areas such as agro-input supply, professional service provision and output marketing. The project will also collaborate with Dutch knowledge centers and other agricultural development projects and focus on effectiveness and efficiency, thus increasing the project's impact and return on investment.

CATALIST-Uganda

The goal of CATALIST-Uganda is to sustainably commercialize smallholder agriculture through improved productivity and market development, resulting in marketable surpluses that raise farm incomes in Uganda, and increase regional food security for the East African and Great Lakes regions.

Starting with the 'pull' of the market, CATALIST-Uganda will employ a systems approach to develop integrated cropping systems around priority commodities – Irish potatoes, cassava and rice – combined with an accelerated agribusiness cluster development approach appropriate for Uganda. In addition to agricultural intensification, attention will be given to agro-input market development (both seeds and fertilizer), output marketing, linkages to agribusinesses and improvement of the policy environment.

By the end of CATALIST-Uganda, 100,000 smallholder farmers will have doubled yields, achieved a 50 percent increase in incomes and will have produced an annual marketable surplus of 200,000 mt of cereal equivalents. This will help increase food security, rural incomes and trade in Uganda.

▲ Sesame is a highly profitable, drought-tolerant crop that can provide farmers income in times of below-average rainfall. While sesame is not a priority crop for IFDC in Uganda, it will be grown as an effective rotation crop.

Seeds for Development – Demonstration Plots in South Sudan

Funded by USAID and the Howard G. Buffet Foundation, the 18-month Seeds for Development project began in October 2011. The project is helping South Sudan successfully introduce agro-inputs (particularly hybrid seed and fertilizer) and promote their proper use in order to increase agricultural production and productivity. These steps will lead to increased food security and income generation.

The project is jointly implemented by IFDC and AGRA. AGRA is responsible for strengthening the nation's crop breeding capacity and IFDC is championing access to, awareness of and proper use of quality fertilizer and quality seed of superior varieties supplied through a network of agro-dealers.

In partnership with USAID's Food, Agribusiness and Rural Markets (FARM) program, IFDC and AGRA established nearly 6,000 technology transfer demonstration plots across three Equatorial states to train farmers on good agronomic practices and proper use of inputs through practical demonstrations. The Agricultural Market Development Trust (AGMARK) was sub-contracted to identify and train agro-dealers. This activity is being carried out in collaboration with South Sudan's Ministry of Agriculture and Forestry.

IFDC is also responsible for a subsidized input voucher program to ensure small-scale farmers can affordably access seed and fertilizer and is teaching agro-dealers and farmers how to redeem the vouchers.

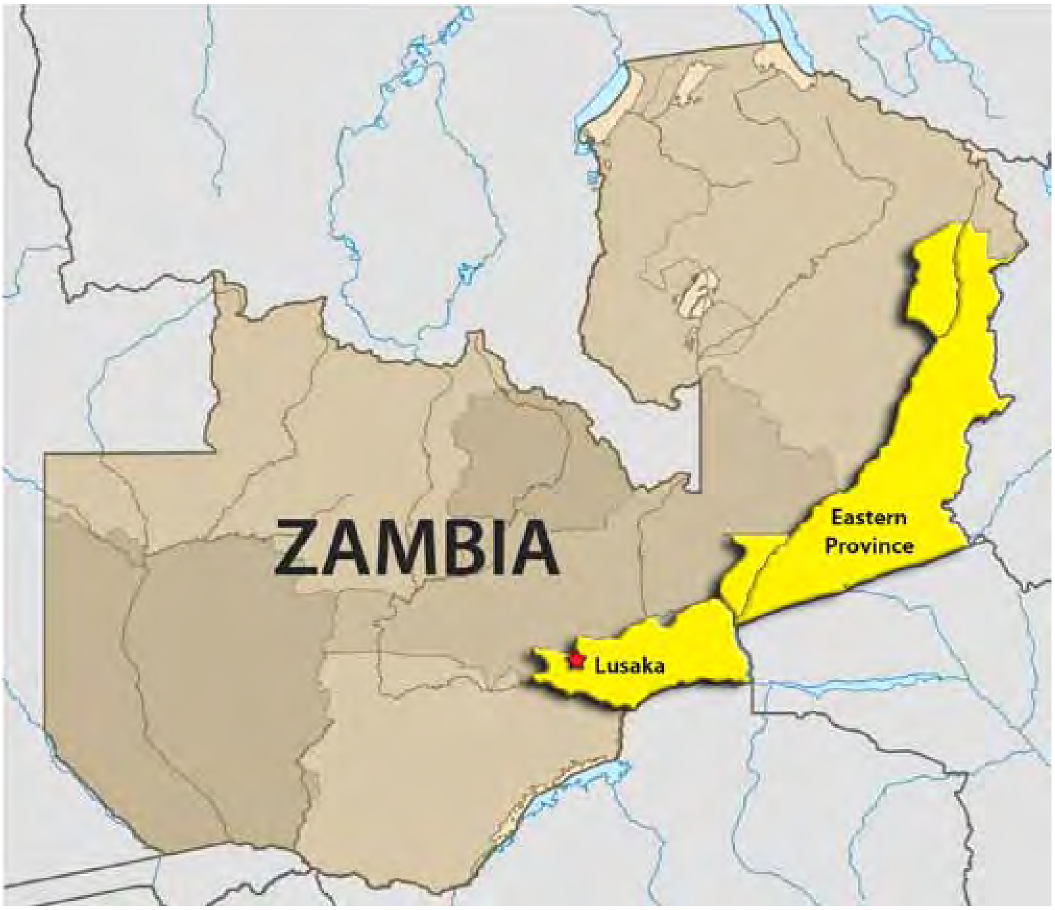
▲ In partnership with USAID's FARM program, IFDC established 22 technology transfer demonstration plots across three Equatorial states. These demonstration plots are helping to educate agro-dealers and farmers and offer the agro-dealers the opportunity to prove their value to farmers by providing information on the proper use of agro-inputs.

"We're also helping agro-dealers increase their inventories by linking them to manufacturers and suppliers and to credit facilities."

– Rob Groot,
director of East and Southern Africa,
Seeds for Development

▲ 1) Demonstration plots are very successful in convincing farmers to use proper agro-inputs. 2) Demonstration plots are established in collaboration with agro-dealers, agricultural training centers and FBOs. Farmers are being trained on the proper use of agro-inputs. 3) Crop performance is impressive. The difference between the unfertilized plots (left) and the properly fertilized plots is quite noticeable. Farmers who were initially resistant are now convinced that fertilizer use will greatly increase their yields (and incomes). 4) Seeds for Development is designed to help South Sudan increase food production through the proper use of agro-inputs and to encourage the establishment of agro-dealer shops.

IFDC Partners With ACDI/VOCA on Food Security Project in Zambia



▲ In the USAID PROFIT$^+$ project, IFDC will introduce ISFM to smallholder farmers in Zambia's Eastern Province and around the capital city of Lusaka.

USAID recently awarded the Production, Finance and Improved Technology Plus (PROFIT$^+$) project in Zambia to ACDI/VOCA. IFDC is among a number of partners assisting ACDI/VOCA on PROFIT$^+$. The project is part of the U.S. government's FtF global hunger and food security initiative. The project will help smallholder farmers to increase productivity and have better access to markets.

Zambia is located in southern Africa, east of Angola. The country's total land area is 752,618 square kilometers. In comparison, Zambia is slightly smaller than the U.S. state of Texas or about the size of Venezuela. Only seven percent of the land is utilized for cultivated crops. Zambia's population is approximately 12 million, with 86 percent living in poverty. About 85 percent of the population is dependent on agriculture for their livelihoods. However, the economy has historically been based on the copper mining industry that has been through several boom and bust cycles and, although doing well at this time, the government is pursuing an economic diversification program that has a major emphasis on agriculture. Zambia has a significant sugar industry and sugarcane is grown on a perennial basis. Other agricultural products grown in Zambia include maize, sorghum, rice, peanuts, sunflower seeds, vegetables, tobacco, cotton, cassava, coffee and livestock.

IFDC Helping to Improve Crop Productivity by Introducing ISFM

IFDC's role in PROFIT$^+$ is to help improve the productivity of selected commodities and develop commercial agro-input markets. Other collaborating partners include: Associates for International Resources and Development, Catholic Relief Services, Crown Agents USA, Danya International and Kimetrica.

During the early stages of the project, IFDC will assist in developing specific and practical activities that will introduce ISFM to smallholder farmers who are participating in maize-based farming systems in the Eastern Province and horticulture value chains around the capital city of Lusaka. This will involve demonstrating a range of improved agricultural technologies and supporting the development of sustainable agro-input supply systems to meet increased farmer demand stimulated by innovative demonstrations.

ISFM is effective at improving the efficiency of fertilizers and enhancing the performance of other agro-inputs, including quality seeds of superior varieties. In addition, ISFM promotes improved crop management practices, measures to control erosion and leaching and techniques to improve soil organic matter maintenance.

- Assessment and identification of soil fertility issues through participatory field appraisals and soil testing with farmers and extension agents.
- Identification of proven strategies to arrest and reverse soil fertility loss.
- Design of an agro-dealer training and accreditation program to professionalize the agro-dealer sector, with a special emphasis on enabling the development of women agro-dealers.

Value Chain Improvements

A value chain links the steps a product takes from farmer to consumer. It includes research and development, agro-input suppliers and improved access to credit. The farmer combines these resources with land, labor and capital to produce commodities.

Diversification of the maize-based system with legumes...offers real opportunities...

– Richard Jones, IFDC agribusiness program leader

According to Richard Jones, IFDC agribusiness program leader, "Zambia's Eastern Province is a high potential area where the informed use of purchased inputs can more than double crop productivity. However, we will focus on helping farmers use agro-inputs on crops that can be profitably marketed. Diversification of the maize-based system with legumes such as groundnuts, pigeon peas and soybeans offers real opportunities because the local, regional and international demand for these crops is well established."

A Focus on Seed and Fertilizer

IFDC will conduct an in-depth examination of the seed and fertilizer sectors for each segment of the value chain. Specific activities will include:

- Assessment of seed and fertilizer producers, input suppliers, agro-dealers and cooperatives.
- Identification of bottlenecks in seed and fertilizer production, importation and distribution.

PROFIT+ expects to achieve a 30 percent increase in productivity and income from selected value chains, benefit 200,000 smallholder farmers and increase the value of agricultural sales by $125 million, particularly for value-added processing. The project will build local capacity for sustainable results; plans call for Zambian nationals to take complete ownership of the project during the third year.

ACDI/VOCA is a private, nonprofit economic development organization that promotes broad-based economic growth, higher living standards and vibrant communities in low-income countries and emerging democracies. Based in Washington, D.C., ACDI/VOCA has worked in 145 countries since 1963. Its practice areas are agribusiness, food security, enterprise development, financial services and community development.

Commercialized Cassava Production in Mozambique Helps Farmers

Workers fill bags with cassava cake after fresh cassava has been initially processed by an AMPU.

In June, IFDC released a summary of findings derived from a 2011 baseline study of the cassava market in select districts of Mozambique's Nampula Province. The study was undertaken in support of the Cassava Plus (Cassava^{+}) project, a PPP between IFDC and the Dutch Agricultural Development & Trading Company (DADTCO) to commercialize the country's cassava production and increase participating farmers' incomes by 22 percent. Cassava^{+}, which began in Mozambique in 2011, is funded by the DGIS/Schokland Fund.

Cassava a Key Cash Crop

The report provides information on the collective circumstances and mindset of farmers who grow cassava as a means to support their families. The summary notes that among the 519 households interviewed, farmers not only perceive cassava as a major food crop but also as a very important cash crop. The report focused on northeastern Nampula Province and targeted the districts of Ribaue, Murupula, Mecuburi and Namialo. For most farmers in these districts, cassava is considered to be a more important cash crop than maize or other traditional high-value crops.

"Cassava is definitely not a poor man's crop in Mozambique; it has a very positive connotation," the report's authors state in their summary. Yet the majority of smallholder farmers in these areas are very poor. All households surveyed indicated that clearing and preparing land are performed manually. On average, households own only $90 of productive farming assets, and many possess only hand hoes and machetes. These farmers face market-based issues that hinder the production and sale of their harvests, such as lack of access to timely and affordable inputs, improved cassava varieties and output markets, as well as lack of extension services and transportation.

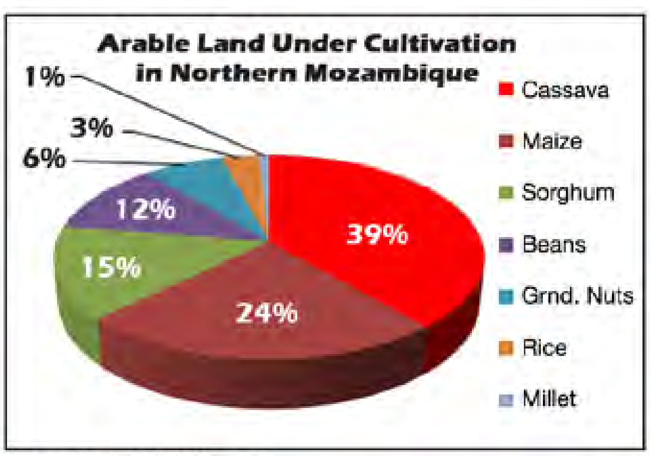
According to farmer estimates, the average provincial farm size is 2.0 ha. Only in Namialo do farmers cultivate more hectares per household. The annual cassava root yield in Nampula Province is estimated to be about 2.4 mmt. This total annual output is particularly significant because there are an estimated 3.5 million people living in the province. "This means that per person, about 600 kg of cassava roots are available per year, which is about 1.7 kg of cassava roots per day. Using this calculation, it becomes clear that farmers in Nampula cultivate far more cassava than is required to feed its population – and therefore are selling or trading their surplus production. The reason that many farmers continue to grow cassava is that it is a secure crop that will almost always provide a yield. Risk aversion is still a major strategy for farmers when it comes to food production," the report states.

But even with widespread cultivation, none of the farmers surveyed make use of improved cassava varieties, which would increase their yields (particularly if the farmers also utilized other modern agricultural technologies). "Due to this fact, the average yield per ha is extremely low (between 5.0 and 7.0 mt/ha)," states the report. "There is an opportunity to double the average yield (in future growing seasons), provided that distribution of disease-free improved varieties takes place in an effective manner that is also acceptable to farmers."

Commercializing Cassava

Currently, the majority of the farmers grow sweet varieties of cassava, intercropped with beans, maize, groundnuts, millet and sorghum. In Murupula District, however, about half of the farmers surveyed grow bitter varieties of cassava. For commercialized processing purposes, bitter varieties are more advantageous than sweet varieties because they produce larger tubers. The report notes that bitter varieties also have higher yields and are more pest-resistant – a strong combination of benefits that will help meet DADTCO's (and other private sector partners') needs in their objective to process larger quantities of cassava.

The intervention of IFDC and DADTCO under the Cassava+ project is particularly critical in commercializing Mozambique's cassava production, because most farmers who engage in cultivation are far removed from much-needed market support. As a particularly effective example, the report notes that Nampula's cassava farmers live in relative isolation from Mozambique's broader cassava market. Most households indicated that it takes more than one hour by foot to reach certain services. For over one-third of the farmers surveyed, their remote farm plots are even farther away. To further exacerbate this inability of farmers to link with their markets, virtually none of the rural farm families own a car or truck, only half own a bicycle, and only 15 percent own mobile phones.



Adapted from DADTCO website

Land Rights Remain a Concern

Mozambique's 2004 Constitution states that all ownership of land vests in the State and that all Mozambicans shall have the right to use and enjoy this land as a means to create wealth and social well-being. The Constitution further provides that the State shall recognize and protect land rights acquired through inheritance or by occupation, unless there is a legal reservation or the land has been lawfully granted to another person or entity.

The dual objectives of Mozambique's land law – support for rural community land rights and the encouragement of private investment – are certainly progressive, but have been unevenly implemented, according to the report. The language of the law has had the consequence over time of creating two distinct classes of landholders – large commercial enterprises and subsistence farmers. This provides communities with some degree of tenure security over their land, but a majority of rural residents are unaware of their land rights and the opportunities to use land.

Seen as a major barrier to agricultural intensification, especially in the case of cassava (which can take a year or more per crop cycle), land tenure and land rights policies must be reevaluated for their effectiveness and parity among small- and large-scale farmers, and an enabling environment must be created for medium-scale farmers to enter the market.

Bridging the Gap Between Farmers and Their Markets

The study also makes note of the cassava value chain in Nampula Province. "The majority of traders in Murupula and Mecuburi are from the provincial capital, Nampula. This suggests that the prices for cassava in Murupula and Mecuburi are higher than those paid in the other two districts."

A cassava demonstration field illustrates the benefits of using modern agricultural technologies.

The report also states, "There is a relatively large presence in Ribaue of traders from western provinces. It could be that mining in western Mozambique also influences the number of outlets that sell cassava roots in Ribaue. Most of the cassava in Namialo is sold to traders from other districts."

As the report indicates, the current cassava market is unevenly represented throughout the region. With broad market price fluctuations within the province and unscrupulous middlemen who take advantage of farmers' inability to transport their produce to more profitable market locations, those who need most to profit from the crop are often unable to do so.

Using Commercialized Cassava to Improve Livelihoods

The report also studied prevalent socioeconomic indicators in the province, which reflect the current quality of life for most farmers. The report notes that only a few farmers in Nampula Province own livestock. In the areas surveyed, none of the farmers own cattle and only a quarter own goats. Their working tools are simple and of little value. Homes are mostly constructed of adobe brick with leaf, grass or straw roofs. All households surveyed cook only with fuel wood, and village sanitation is an ongoing concern due to the lack of modern facilities. When asked what they would do with additional farming income, respondents indicated that the first proceeds would be used to buy food for the family. They would then improve their farms and homes.

IFDC and DADTCO are working with farmers to help them increase all of these indicators in the near future. In recent years, cassava has begun to be recognized as a low-cost substitute for higher-priced, grain-based raw materials. Products derived from processing cassava roots (such as cassava cake, high-quality cassava flour, starch and glucose) are ideal alternatives for manufacturers of

consumer and industrial products as world grain prices continue to rise.

Through expanded PPPs first begun in Nigeria, Cassava+ is now promoting commercial cassava production in Mozambique and helping to address the needs of Nampula's smallholder cassava farmers.

Creating a Cassava Value Chain

Project staff are working with farmers to increase production to as much as 20-30 mt/ha by providing improved cassava varieties, ISFM training to boost soil fertility and demonstrations. Critical to the project's success are DADTCO's automated mobile processing units (AMPUs), which process fresh cassava on-farm or nearby, negating the risk of spoilage (which occurs within 24-48 hours of harvest) if harvested roots were shipped to distant processing facilities.

Perhaps IFDC's most important initial step is working with Mozambique's National Institute of Agricultural Research (IIAM) to introduce disease-free planting material from superior cassava varieties, using agro-dealers and lead farmers as distribution points for other farmers. With these combined efforts, Cassava+ not only improves local food security but also creates a value chain that allows participating farmers to sell surplus cassava roots to DADTCO, which offers a purchase guarantee. DADTCO in turn produces cassava cake, paste, flour and other products for industrial and commercial use, such as Impala, the cassava beer brewed by SABMiller's Mozambican affiliate, *Cervejas de Mocambique*.

The beneficiaries of this first phase of Cassava+ are 1,500 households (6,000 people) in these four

districts of Nampula Province. As household incomes increase because of the commercialization of cassava and socioeconomic indicators rise, money will be infused into local economies in the form of purchases of farm equipment and supplies, home improvements, school supplies and other necessities. New public and private investments in infrastructure are also expected in the effort to support the revitalized value chain.

The IFDC baseline report has helped to put into context the point from which the Cassava+ project began in Mozambique. The report uncovers obvious areas of needed improvement in building cassava markets across the region, but it also makes note of the independent progress made to date by both the farmers and the Government of the Republic of Mozambique in promoting the production of this valuable crop. With the assistance and expertise of IFDC, DADTCO and the Dutch government, it is hoped that Mozambique, its cassava farmers and the private sector will soon see lasting benefits from the partnership.

▲ One of DADTCO's AMPUs is painted to advertise 'Impala,' the cassava-based beer brewed in Mozambique.
◄ Workers 'feed' cassava onto the conveyor belt of an AMPU. The AMPU processes the cassava into cassava cake.
◄ (Opposite bottom): An employee of Corredor Agro Ltd., a contract farming company working with DADTCO and IFDC, cuts disease-free improved mini-stems (seeds) for distribution in Nampula Province.

IFDC Provides Support to the Africa Soil Health Consortium

"Supporting knowledge-sharing on ISFM for increased productivity"

Poor soil fertility is a key constraint to improving farm productivity and farmer livelihoods in SSA. After several decades of emphasis on biological approaches to soil fertility improvement (in part because mineral fertilizer availability was itself a major constraint), there is now widespread recognition of the need to integrate increased mineral fertilizer use with other aspects of soil fertility management. Therefore, an effort to broaden the use of ISFM is underway.

The Africa Soil Health Consortium (ASHC) is funded by the Bill & Melinda Gates Foundation. The ASHC seeks to improve access to effective and appropriate materials regarding ISFM in the public and private sectors – from policymakers to university lecturers, extension workers, input suppliers and farmers. These extension materials can take a variety of formats including print, radio, video documentaries, television broadcasts and locally staged dramas. ASHC has drawn upon the expertise of a Technical Advisory Group comprised of 14 experts in matters related to agronomy, soil science, communications development, gender and policy.

Joining IFDC as ASHC collaborators are Advanced Research Institutes; AGRA (and in particular AGRA's Soil Health Program); the African Soil Information Service (AfSIS); the CAB International (CABI) Information and Communications Technology and Knowledge Management (ICT-KM) Program; International Plant Nutrition Institute (IPNI); National Agricultural Research and Extension Systems (NARES); and farmers, educators and media service providers.

Two IFDC staff are members of the Technical Advisory Group and are also providing monitoring and evaluation (M&E) services to ASHC. IFDC is responsible for leading assessments of the project processes, collecting views from stakeholders in a structured manner and conducting formal evaluations to assess the value of the communications products and how they contribute to outcomes.

'Write-Shops' Hosted in Ghana

In July, August and September, ASHC, AGRA and MoFA hosted three intensive 'write-shops' in Ghana that convened multi-disciplinary teams of grantees, local graphic artists, radio and video producers and representatives of extension organizations. The purpose of the write-shops was to design, field test, review and adapt ISFM extension materials. The write-shops focused on structuring ISFM information in ways that make the associated technologies easier to understand and implement. This approach will increase the use of soil health improvement techniques by farmers in Ghana. The first write-shops were held in the Northern, Ashanti and Volta regions.

"The intervention has dual objectives of designing audience-appropriate extension materials and at the same time transferring to partners a unique materials development process that draws upon the skills of multi-disciplinary teams so they are empowered to undertake similar activities on their own beyond the ASHC grant period," said Kelly Stenhoff, IFDC M&E specialist.

ISFM Technologies

The partners identified priority ISFM technologies that are ready for dissemination or that are already being disseminated and need to be scaled up in the three cropping systems of Ghana – maize/rice/soybean (Northern Region), cassava/maize/soybean (Ashanti Region) and rice/maize/cowpea (Volta Region).

Currently, MoFA uses extension approaches, as well as radio and television, to disseminate information to farmers. The Ministry has been using the agro-link radio program to publicize agricultural initiatives and this channel could be an avenue for disseminating ISFM technologies. Radio messages are effective to reach farmers who cannot read. However, the message can be difficult to reproduce in all languages and for all partners.

Shamba Shape-Up

One effective way to disseminate information about ISFM is through video. *Shamba Shape-Up* is a 'make-over' television series that features farm families in East Africa and addresses specific challenges to improving their farms ('shambas'). The program includes agricultural experts who demonstrate practical methods and technologies that can transform farm productivity. The series' tagline is "Grow more food, make more money, build a better life."

In episode one, Philip Karuri, IFDC's country representative in Kenya, is the featured soil fertility expert. Karuri explains the importance of using fertilizer to increase yields and the benefits of soil testing to determine what type and quantity of fertilizer to apply. ISFM is one of several technologies that are explained during the course of the program.

The series is produced by Mediae and sponsored by both public institutions and commercial companies. Through financial and technical support to *Shamba Shape-Up*, IFDC and ASHC are promoting approaches to improved crop health through ISFM and AGRA is promoting improved seed technologies.

ASHC Project Manager George Odour said, "We were keen to explore *Shamba Shape-Up* as a vehicle for disseminating information on soil management. The first programs were filmed in Kenya, where the production company is based, but we are in discussions about filming in northern Tanzania and possibly Uganda, too, because we have significant pilot activity in both locations."

Odour explained that the production team also measures the impact of the messages incorporated in the television programs. Comprehensive surveys are conducted before and after the broadcasts to measure changes in knowledge, attitude and practices relating to soil fertility management techniques. For more information about *Shamba Shape-Up*, go to www.shambashapeup.com.

October Conference in Kenya

ASHC and AGRA are planning "ISFM in Africa: From Microbes to Markets," a conference to be held October 22-27 in Nairobi, Kenya. The conference will deal with the comparison and scaling up of breakthrough technologies and M&E of impacts within rural settings and along agricultural value chains. It will also explore strategies to increase human and institutional capacities in ISFM.

The ASHC project began in January 2011 and ends in June 2014. It is being coordinated by CABI, an international science and agriculture organization, through their Africa team. For more information about the Africa Soil Health Consortium, go to www.cabi.org/ashc.

PReFER's Fertilizer Privatization Strategy Launched in Rwanda

▲ Farmers fertilize young potato plants in Rwanda.

The Privatization of Rwanda's Fertilizer Import and Distribution System (PReFER) project achieved several significant milestones during the second quarter. The project, which is funded by USAID and implemented by IFDC, focused on the official launch of a comprehensive fertilizer sector privatization strategy.

PReFER obtained approval from Rwanda's Ministry of Agriculture and Animal Resources (MINAGRI) for a work plan outlining the tasks and timeline for the strategy. The plan was based on a roadmap developed in the previous quarter with input from MINAGRI's Fertilizer Sub-Working Group. Plan approval allows activities to get underway, moving MINAGRI and PReFER closer to achieving the goals set out in the privatization strategy.

In addition, PReFER continued its work with ENAS, a fertilizer distributor in Rwanda's Eastern Province. PReFER previously signed a memorandum of understanding (MoU) with ENAS during the 2012-A planting season. PReFER staff members monitored the ENAS fertilizer distribution system in the province, from work with MINAGRI to sales to farmers. The MoU covers six districts, 84 sectors, 86 agro-dealers and 81,418 farmers. ENAS delivered 5,546 mt of fertilizer in the 2012-A season (more than 18 percent of Rwanda's annual fertilizer consumption) and achieved sales of $5.2 million. More than 95 percent of the fertilizer was distributed on credit and 21,959 farmers (about 27 percent) used a voucher.

Promoting Loans/Loan Repayment

PReFER staff members also are supporting and training ENAS teams to collect payments for fertilizer purchased on credit through the voucher system. The outstanding loans total approximately $2.56 million. The loan collection rate increased to more than 36 percent, an improvement from the previous year's repayment rate of only 15 percent.

To increase the loan repayment rate, the PReFER team organized district and sector meetings. The meetings included distributors, agro-dealers, service providers, local authorities, district and sector agronomists and farmers. Engaging all stakeholders is an effective method for achieving better results. Moreover, it underscored that fertilizer was not free and that there was a method in place to seek repayment.

"Higher rates of loan repayment will come from changes in attitude and behavior. Farmers and agro-dealers must recognize that fertilizer is not a gift from the government," noted Martin Drevon, PReFER chief of party. In addition, district, sector, cell, village and civil society authorities must join efforts to educate the public and hold stakeholders accountable for repaying credit. The goal is to help ENAS achieve a loan repayment rate of 60 percent.

PReFER is also working to improve access to and management of trade credit. As part of this goal, PReFER staff assisted ENAS to make bank services and credit more accessible to fertilizer agro-dealers and farmers. As a result, 80 bank accounts were opened in the Eastern Province, allowing agro-dealers and farmers to broaden their options for paying for fertilizer.

Bank accounts are considered critical to increasing the rate of payment for fertilizer. The strategy allows agro-dealers, local authorities, service providers and farmers to send money directly to ENAS' accounts. This guarantees payment and allows ENAS to maintain rigorous monitoring.

- Although more organized than they were a few years ago, farmers are still not fully organized or integrated – many still do not belong to FBOs or cooperatives. Therefore, PReFER recommends that FBOs and cooperatives do more to motivate farmers to join them.
- Many farmers remain in debt. Some agro-dealers continue supplying fertilizer to farmers in arrears, reinforcing the impression that fertilizer need not be paid for or that fertilizer is a gift from the government. PReFER recommends continuing/expanding public education campaigns and meetings about the benefits of fertilizers – as well as the necessity of repaying agricultural loans of any kind. In addition, lists of farmers who do not pay their debts in a timely fashion should be posted publicly.

A primary project goal is to initiate and develop knowledge of international fertilizer markets and supply chain management. As part of this goal, PReFER staff members also attended meetings and engaged in field trips that allowed them to share information on the privatization program with international fertilizer suppliers.

PReFER staff concluded that the companies are interested in entering the Rwandan market, but they are concerned about MINAGRI's central role in the fertilizer sector and the outstanding debt that exists throughout the supply chain. Therefore, the Rwandan market may not yet be mature enough to attract major and sustainable investment. However, further meetings are scheduled in Rwanda with the hope of creating technical and development opportunities.

PReFER staff also traveled to Uganda to meet with private investors involved in various agricultural sectors including fertilizer, commodities and warehouse control. PReFER and the investors discussed the long-term potential of the fertilizer market in Rwanda.

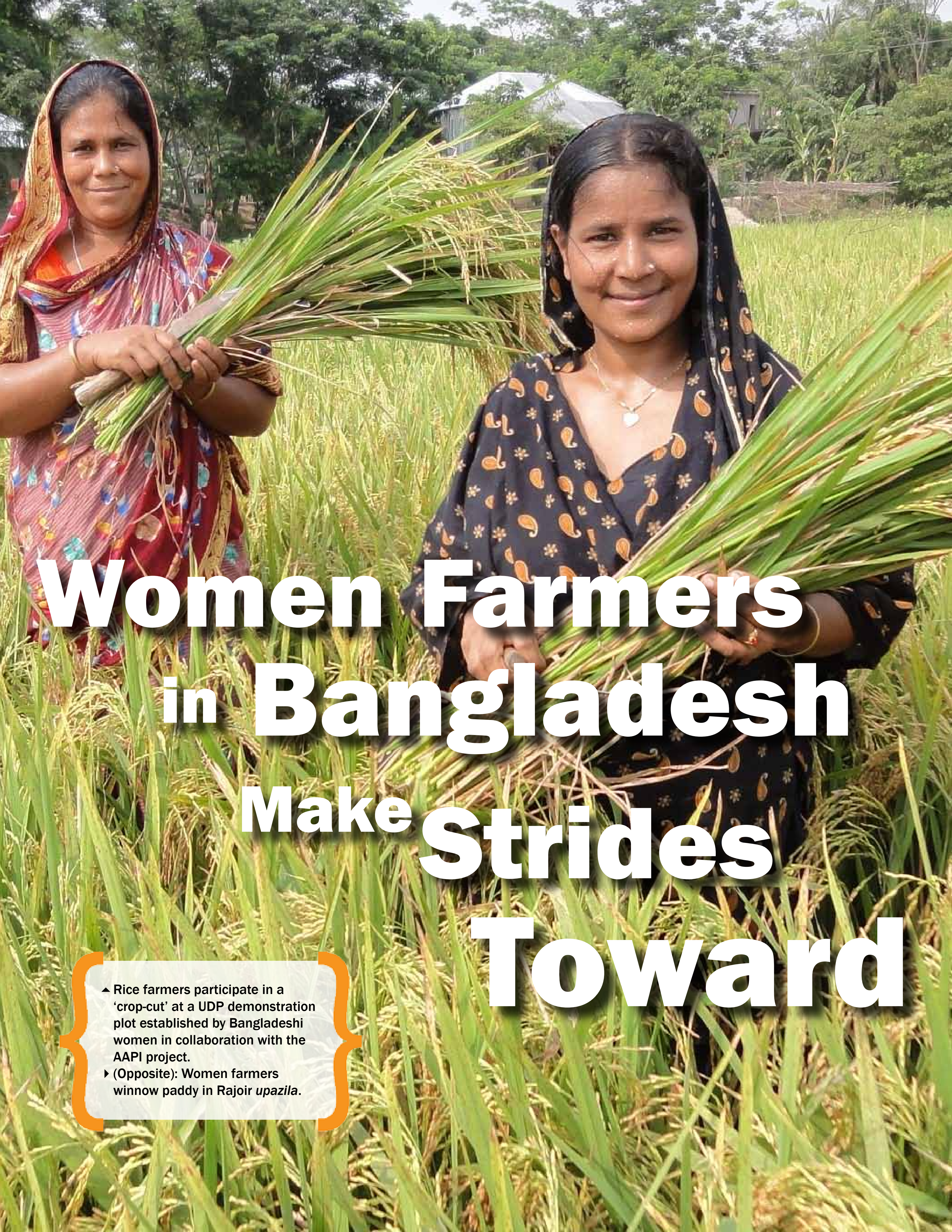
Farmers and agro-dealers must recognize that fertilizer is not a gift from the government.

– Martin Drevon, PReFER chief of party

Challenges to Fertilizer Expansion

Although a great deal of progress has been made over the past five years, there are several challenges that must be overcome to expand the use of fertilizers. For example, in the Eastern Province:

- Although the rate of fertilizer use has increased, it is still too low. In the 2012-A maize season, the diammonium phosphate (DAP) application rate was 52.2 percent and the urea application rate was 48.6 percent in Rwamagana District. To increase the rate of use, PReFER recommends expanded extension services and study tours for FBO leaders so that they can receive greater exposure to advanced techniques in fertilizer application.
- Unexpected climate events such as droughts and floods and/or damage from wild animals occur. To counteract these acts of nature, PReFER recommends the development of irrigation and drainage programs and the establishment of a guarantee fund for agriculture to provide compensation in times of natural disaster.



Women Farmers in Bangladesh Make Strides Toward

- Rice farmers participate in a 'crop-cut' at a UDP demonstration plot established by Bangladeshi women in collaboration with the AAPI project.
- (Opposite): Women farmers winnow paddy in Rajoir *upazila*.

Gender Equity

IFDC's Accelerating Agriculture Productivity Improvement in Bangladesh (AAPI) project is creating an immediate impact on crop yields and increasing farmers' incomes through improved resource use efficiency. The project emphasis is on the diffusion of modern technologies, such as FDP and alternate wetting and drying, and the development of support systems to achieve their sustainability. This USAID-funded project also has another mission: the empowerment and inclusion of women in Bangladesh's agricultural system.

AAPI is in the process of achieving a 20 percent participation rate by women in its major rice cultivation activities; the number is expected to increase to 50 percent for vegetable production and 100 percent for homestead gardens. AAPI's gender equity strategy is to generate greater family and community acceptance of women's participation in agriculture. As part of that strategy, AAPI promotes the education of women farmers in modern agricultural technologies and ensures that women have equal access to these tools and their financial benefits. The project is working to increase women's role in rice production, ensure food security at the household level and assist women to establish entrepreneurial enterprises.

Recent research shows that such advancement in gender equity can be made. A 2011 report by Bangladeshi researchers[1] indicates that from 1999 to 2006, participation by men in the agricultural labor force declined by seven percent, while female agricultural laborers increased by 103 percent to 7.7 million. The report notes that as men move from farming to the service industry and other non-agricultural sectors, women are gaining more acceptance as paid farm managers and post-harvest processors. However, even with their increased participation in the labor force, women continue to be paid less than men.

AAPI staff members confirm the report findings. "The women of Bangladesh are very involved in farm activities," said Ishrat Jahan, IFDC country representative for Bangladesh. "Women do not generally till the fields, prepare seedbeds, transplant seedlings, weed, apply fertilizers or manage irrigation. But certainly, when the crop is ready for harvesting, it is the female farmer who steps in," added Jahan. She noted that Bangladeshi women manage about 80 percent of post-harvest activities – and added that home gardening, which is becoming increasingly popular, is managed almost exclusively by women.

AAPI is working to enhance understanding by women of modern agricultural technologies, including the benefits of improved seed, water management and conservation, balanced doses of fertilizer and FDP techniques. AAPI leaders assert that if men and women have equal access to this knowledge, share in the farming decisions and work together, then food security will be dramatically increased.

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[1] *"Women's Participation in Agriculture in Bangladesh 1988-2008: Changes and Determinants," authored by W.M.H. Jaim, professor, Department of Agricultural Economics, Bangladesh University; and Mahabub Hossain, executive director, BRAC, was presented at the 7th Asian Society of Agricultural Economists International Conference, Hanoi, Vietnam, October 2011.*

▲ Women work together with men to dry paddy in Jamalpur.

The 2011 report does concede that given the socio-cultural context of the nation, women may never be fully engaged in all field activities. However, AAPI staff believe that the important roles that women have traditionally played in agriculture should be emphasized and expanded. As an example, women's roles in seed production and preservation and post-harvest technologies are crucial tasks in rice production. Traditionally, men select the varieties and produce the seed. But if the seed is of poor quality, or if paddy (rice) processed by women is not dried, cleaned and stored properly, then losses will be high and food security will be compromised. "If women have access to better technology, they can contribute immensely to increased productivity by ensuring the preservation of higher-yielding seed varieties and the proper drying and storage of the grain," said Jahan.

Many other examples of the important roles women play in Bangladeshi agriculture can be cited, including that of women as entrepreneurs. Under AAPI and previous IFDC projects, women are gaining greater prominence as managers or owners of agro-input shops and FDP briquette manufacturing operations. AAPI will continue its efforts to improve the roles played by women in Bangladesh's agriculture sector, and will focus on supporting their advancement through technology transfer and access to the tools they need in order to succeed.

AAPI Encourages Gender Equity by Training Couples to Farm Together

AAPI is training farming couples on the use of FDP in vegetable cultivation. IFDC believes capacity building and understanding of this technology by family members in their own context is crucial.

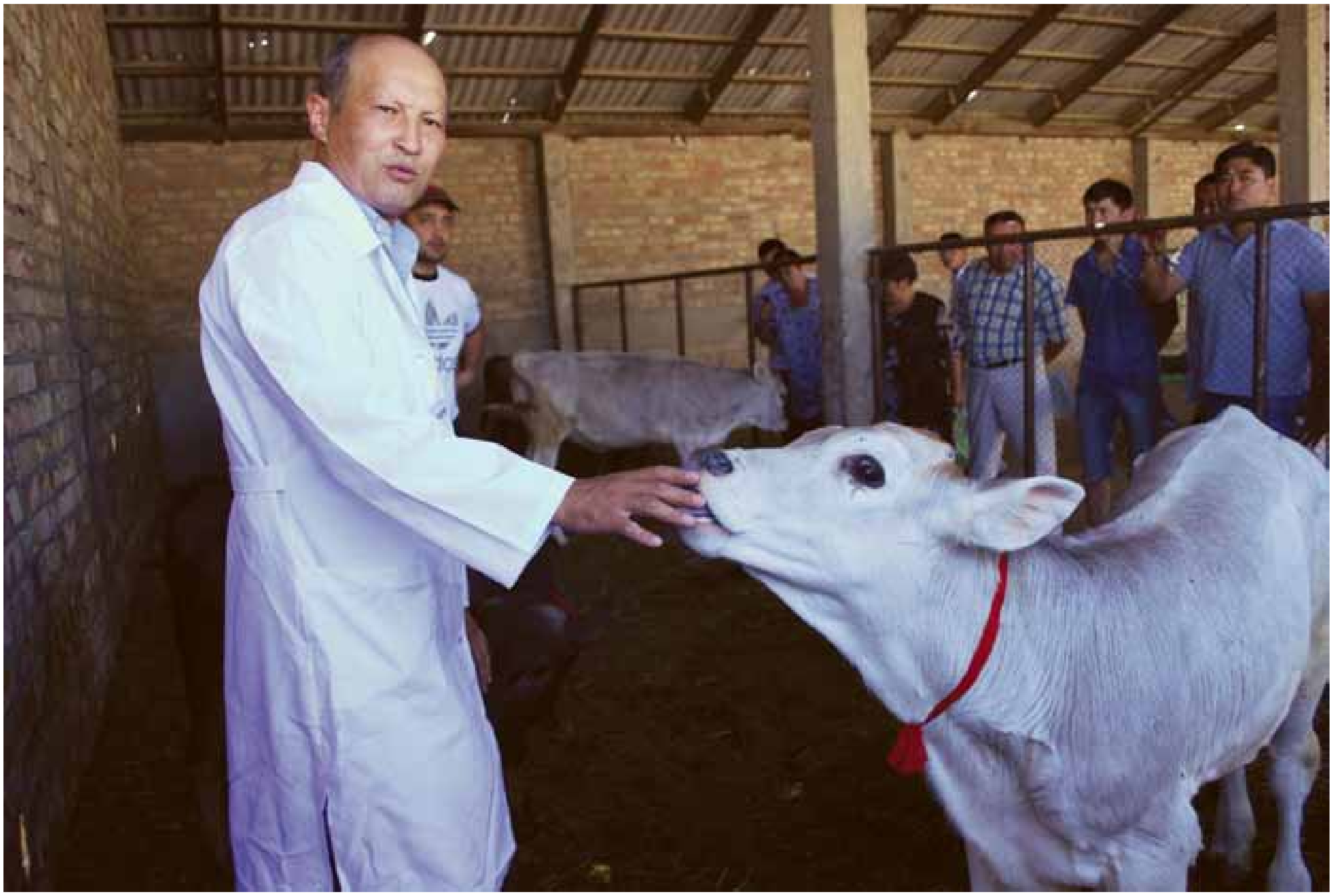
Dipalee and Tusher Kithnia of Ragunathpur in Gopalganj received joint training from AAPI staff and found it to be a rewarding experience. They established a tomato demonstration plot on 10 decimals of land (1.0 decimal is equal to 0.01 acre or 0.004047 hectare). They used FDP technology on 5.0 decimals and applied prilled urea on the other 5.0 decimals. They planted the Delta Hybrid variety of tomatoes, harvesting 54.67 mt/ha of tomatoes from the FDP plot and 46.70 mt/ha from the prilled urea plot (a difference of 7.95 mt/ha). The couple earned Tk 40,540 (US $497) from 10 decimals of land and expected to harvest two to three more times. Their conclusions were:

- The plot on which they used FDP generated a higher yield with good quality.
- The joint training led them to decide together to continue using the FDP technology.
- Earnings from sequential plantings helped them solve their immediate family needs.

▲ Dipalee and Tusher Kithnia make joint decisions regarding their tomato crop.

“IFDC’s KAED project helped me to produce high yields and make a good profit this year.” – Asan Orunbaev, farmer beneficiary from Kara-Suu *rayon* (town), Osh *oblast* (city). Orunbaev, who rents 3.0 ha of rehabilitated land in Kara-Suu *rayon’s* Ak-Tash rural council, planted sunflowers that generated a yield of 2.5 mt/ha. “My income from the sale of my sunflower crop was 175,000 Kyrgyz *soms* [US $3,736] this year. I never imagined that it was possible to earn that amount of money from a rehabilitated plot of land,” said Orunbaev.

KAED Sponsors Field Days and Russian Study Tour



▲ Veterinarian Kalmurat Djaparov explains the importance of proper veterinary care to dairy farmers at a KAED field day event.

Dairy Field Day

The Kyrgyzstan Agro-Input Enterprise Development (KAED) project organized and sponsored a field day in June at one of the project-assisted demonstration farms. There are five project-assisted dairy farms in the northern part of the country and two in the south. Topics for the field day included proper management of dairy cows, improved genetic breeds, enhanced feeding rations and veterinary care.

"I was amazed with the high quality of feed on this farm," said Amankulov Abdyrazakov, a dairy farmer from Sokuluk *rayon* and one of 68 participants. "The alfalfa straw that they use is of the best quality. Look at these cows, they are perfect!"

The project-provided support to this demonstration farm included upgraded equipment for feed and water, construction of a calving barn and the purchase of quality cross-bred cows. Milk production on the farm has increased by 50 percent as a result of improved rations and advice on upgrading husbandry and sanitary conditions. Many farmers are using these comprehensive and practical methods to increase dairy cow productivity; those attending the field day were encouraged to apply improved practices on their farms.

Anara Sultankulova, a farmer from Chui *oblast*, said, "I never imagined that a small farm could be so well-equipped. Today I saw an excellent example of proper farm management. I am inspired to apply these same practices on my farm!"

▲ Seed farm participants on a KAED study tour visit the Rostselmash Company to view the latest agricultural equipment.

Study Tour to Russia

A study tour to Russia was organized by KAED for Economic Development Fund (EDF) Phase II program participants during May and June. Managers of eight seed farms visited breeding centers and agricultural machinery companies in Rostov, Stavropol, Svetlograd and Zernograd.

In the city of Rostov-on-Don, the group visited the Rostselmash Company, where new agricultural machinery was demonstrated. Participants visited research institutes in Zernograd and Stavropol and learned about new varieties and hybrids of various crops. The study group also visited enterprises in Svetlograd that produce field machinery as well as the Luch Seed Company, which is engaged in primary seed breeding of varieties from breeding centers in Krasnodar, Odessa, Stavropol and Zernograd.

Abdigapar Jalalov, head of the Kara-Dobo seed farm, said, "This was a very productive study tour. I've learned so much about seed farming in Russia. I believe this knowledge will help us to further develop our seed farms in Kyrgyzstan."

▲ Kyrgyz participants attending a field day focused on seed production.

Seed Production Field Day

In cooperation with the Ministry of Agriculture and Land Reclamation of the Kyrgyz Republic, KAED organized a field day held July 12 in Aksuu *rayon*, Issyk-Kul *oblast*. A total of 82 people, including 15 women, attended the field day to learn about developing seed production in Kyrgyzstan and proper use of CPPs. Representatives of the Seed Variety Testing Committee, Republican Seed Inspectorate and Association of Seed Producers of Kyrgyzstan actively participated in the field day.

The field day was held in two stages. During the first stage, new improved varieties of cereal and oil crops were demonstrated to the farmers and other participants; the safe use of CPPs was emphasized. During the second stage, participants visited a Zarya farm field sown with a high-yielding potato variety and were trained on potato cultivation and harvesting techniques. The field day helped farmers in this remote area to realize the importance of improved seeds.

KAED Project Promotes Soybean Cultivation in Kyrgyzstan

Kyrgyz farmer Estebes Beisheev in his healthy soybean field.

"Thanks to the KAED project, I increased my income this year by 30 percent," said Estebes Beisheev, a successful soybean farmer. Estebes owns 30 ha of land in Issyk-Ata and Kemin *rayons* near Chui *oblast* in Kyrgyzstan. In 2010, he began to participate in an IFDC project funded by USAID, which promoted soybean production.

KAED supports the domestic production of high-quality feed for livestock and poultry. Soybeans are a valuable protein source, and high-quality protein feed is the easiest and most effective way to improve yields of dairy cows and laying chickens. Most soybean meal and other protein-based animal feeds have been imported from Kazakhstan at a high cost to Kyrgyz farmers.

In 2010, KAED established technology transfer centers, demonstration farms and entered into PPPs with the TES-Center (a Kyrgyz NGO specializing in rural advisory services), soy processors and poultry producers to facilitate linkages between farmers and soybean processors. Farmers were provided with soybean seeds, inoculants, herbicides and 100 liters of diesel fuel per hectare on credit until harvest. The project organized numerous trainings for the farmers on using new varieties of soybeans, high-quality agro-inputs and improved cultivation and harvesting techniques.

Over the past two years, the KAED project has demonstrated that soybeans can be grown successfully across Kyrgyzstan. Due to increasing demand for high-quality soybean meal, processors have encouraged farmers to plant more soybeans. In 2011, high-quality, domestically produced soybean meal was available for animal feed for the first time in Kyrgyzstan. A total of 111,157 kg of soybeans – 63,800 kg from the south, 47,357 kg from the north – were produced. Now 8.0 mt of high-quality, protein-based poultry feed are being produced monthly and sold to poultry farmers. Farmers are expected to plant an additional 500 ha of soybeans throughout the country for the 2013 harvest season.

"I appreciate KAED's initiative in promoting soybean cultivation. Last year I harvested 1.7 metric tons per hectare of soybeans. This next harvesting season, I have high hopes to increase my yield to more than 2.0 metric tons per hectare. I've learned new cultivation techniques and I want to share my knowledge with my neighbors and other farmers," Estebes said. In 2013, he plans to expand his soybean acreage. "I believe soybean production will bring tremendous benefit to many Kyrgyz farmers and help them improve their financial circumstances."

Apricot Post-Harvest Handling Program in Tajikistan

Tajik Farmers Increase Income through Decreased Losses and Increased Prices

▲ "As a result of assistance from the USAID Productive Agriculture Project, I increased my income, which enabled me to contribute more to the education of my grand-children. Now they can go to school well-dressed and with improved supplies. With the extra money I earn, I also plan to purchase a tunnel dryer to further improve my PHH processes. I am deeply thankful to the USAID Productive Agriculture Project for this opportunity." – Kholiqova Zaynabkhon.

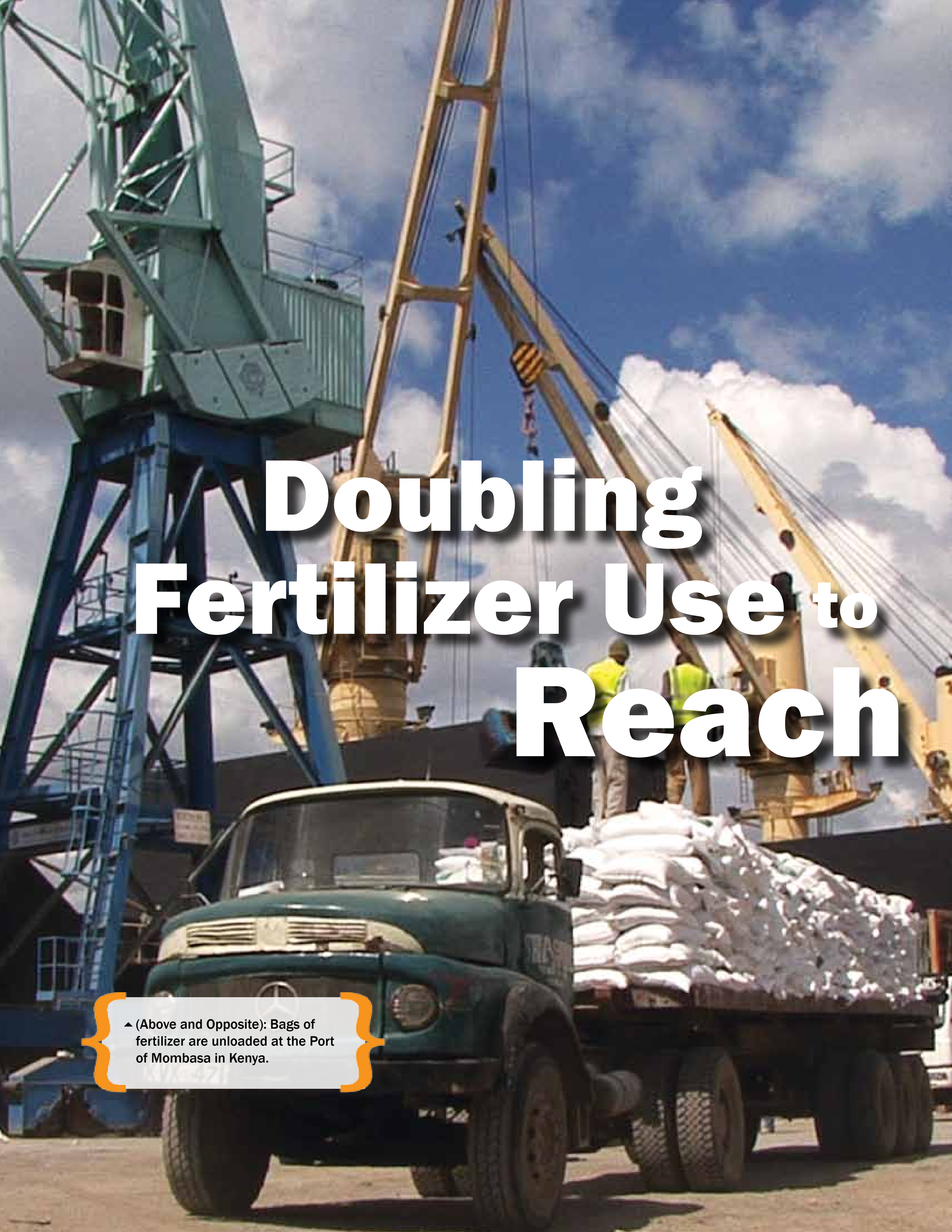
Kholiqova Zaynabkhon, a farmer from the Isfara district of the Sughd region in Tajikistan, owns a 1.0 ha apricot orchard. Income for her 14-member family is heavily dependent on the sale of dried apricots from their orchard. Prior to her participation in the Apricot Post-Harvest Handling Program of the USAID Productive Agriculture in Tajikistan Project, Zaynabkhon would use a stick to remove apricots from trees, dry them on cellophane or on the ground and use traditional sulfur smoking methods to preserve the fruit. These practices led to dramatic post-harvest losses and a severe decrease in the quality of the fruit due to exposure to weather and overheating. According to Zaynabkhon, she lost approximately 70 percent of her apricot harvest each year and the market price of her apricots had to be reduced because of the damage sustained by the fruit during the post-harvest handling (PHH) process.

IFDC implements the Intensify Farm Productivity (IFP) component of the project, which includes the Apricot Post-Harvest Handling Program.

In 2011, Zaynabkhon joined the program, which included an educational component and an opportunity to put the knowledge into practice through a voucher program. Zaynabkhon actively participated in a two-day training class on modern methods, which included drying apricots on pallets to allow proper air flow and sulfur smoking using specially designed sulfur 'houses' to prevent diseases and sustain quality. As part of the voucher program, Zaynabkhon and 200 other apricot farmers in Tajikistan purchased 20 drying pallets and 50 boxes from local suppliers at a 40 percent discount.

After using her new PHH materials and the knowledge gained from the training, Zaynabkhon reported that her post-harvest losses have been reduced from 70 percent to 10 percent. She also reported increased prices for her apricots in the market; this year her apricots fetched between 14-16 Tajikistani *Somoni* (TJS) per kg [1 TJS equals US $0.21.] compared with last year's price of 6-8 TJS per kg. Zaynabkhon told staff from the USAID Productive Agriculture Project that she plans to use this increased income to invest in the education of her grandchildren and to continue improving the quality of her dried apricots, adopting additional PHH techniques such as tunnel drying, which was also demonstrated by the project.

Doubling Fertilizer Use to Reach



(Above and Opposite): Bags of fertilizer are unloaded at the Port of Mombasa in Kenya.

CAADP addresses policy and capacity issues across Africa's agricultural sector and represents African leaders' collective vision for agriculture. CAADP has become a collaborative platform for nations to clearly define goals for agricultural intensification. Through individual Country Investment Plans (CIPs), 34 countries have committed to agricultural reform, with a target of 10 percent of national budgets dedicated to the agricultural sector and an increase in productivity of at least six percent annually by 2015.

As an extension of this effort, AFAP was recently created to reinforce CAADP Pillar 2, which 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 capability 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 develop policies that will govern private sector development, USAID is funding Fertilizer Country Assessment Studies conducted by IFDC. Their purpose is to estimate the fertilizer requirements needed to achieve CIP objectives, and offer policy options to ensure that recommended levels of fertilizer supply are reached.

Utilizing its experience and networks throughout Africa, IFDC is providing a clearer picture of the fertilizer markets in up to 12 CAADP countries that are also FtF countries. The research quantifies current use and future fertilizer requirements for these 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.

CAADP Goals

With fertilizer assessments completed for Ghana, Kenya and Tanzania, future assessments include Ethiopia, Liberia, Malawi, Mali, Mozambique, Rwanda, Senegal, Uganda and Zambia. "This has been a sizeable task so far," said Dr. Peter

Heffernan, director of IFDC's Research and Development Division and co-author of the studies. "By the time we complete up to nine more country assessments, this will rank as the largest single effort to tie the current fertilizer situation facing SSA to the increases required to meet ambitious national goals."

The reports also have major implications in AFAP's attempt to harmonize development efforts. Ghana, Kenya and Tanzania face similar fertilizer supply chain development issues. For these countries to reach their CIP targets, they must nearly double their importation and use of fertilizer over the next three years, according to the IFDC studies.

That recommendation alone implies critical challenges. National policy must immediately integrate private sector involvement in the supply chain, while each government makes major infrastructure improvements (ports, roads, storage, etc.) to accommodate the increased fertilizer supply. It is hoped that nations alerted by the assessments will seek partnerships with AFAP and its coalition of development experts.

GLOBAL TraPs

TRANSDISCIPLINARY PROCESSES FOR SUSTAINABLE PHOSPHORUS MANAGEMENT

Global TraPs World Conference

The first Global TraPs World Conference will take place in Beijing, China, in May 2013. The conference will be co-hosted by China Agricultural University, the Ministry of Education, Phosphorus Fertilizer Industry Association of China and the National Natural Science Foundation of China.

With the exception of the Global TraPs plenary meeting, the conference will be open to all interested practitioners and scientists. The theme of the conference will be "Learning from Cases – Exploring Policy Options." A key goal of the conference is to integrate phosphorus experts from various government ministries into the Global TraPs project dialogue.

The conference will coincide with the 5th International Nutrient Management Symposium. The tentative schedule includes both joint and separate sessions, which will allow organizers and participants to take advantage of synergies, while allowing for project-specific discussions and exchanges.

The first day will follow the format of a scientific conference. There will be parallel sessions on insights/results gained from ongoing and planned case studies, as well as research projects related to key topics (e.g., exploration, use, etc.) and cross-cutting issues (e.g., trade and finance). Besides transdisciplinary (Td) case studies, related contributions from natural and social science projects are welcomed.

Dialogue Sessions and Mutual Learning Sessions will provide the core of the second day. This component of the conference follows the format of the 2000 Zurich Transdisciplinarity Conference. Both Dialogue Sessions and Mutual Learning Sessions are planned for one full day to allow for in-depth discourses by small, selected groups of 20 to 25 participants.

Dialogue Sessions will include panel discussions on briefs, input papers and small group discussions. Mutual Learning Sessions will focus on Td case studies or field visits to nearby farms implementing various phosphorus management strategies. Also, some parallel lecture sessions on selected topics may be held at the conference.

The last day will include panels and wrap-up presentations from representatives of key stakeholder groups.

Additional information on the conference will be provided once dates are confirmed.

El-Jadida: a Transdisciplinary Discourse on Many Levels

The 4th Global TraPs Workshop in El-Jadida, Morocco (held March 16-18, 2012) was a key event for the Global TraPs project. Its importance was initially reflected by the mission of the meeting, which was "Defining Case Studies, Setting Priorities." These goals were the focus for the two days of presentations and discussions. First, consideration was given to what case studies were needed to illuminate and provide answers to the critical questions (knowledge gaps) elaborated in the previous workshops. Second, deliberations centered on required priority areas for sustainable transitions, both from an environmental 'material' flow perspective as well as from social and political perspectives.

There were a number of thought-provoking presentations from representatives of the various stakeholder groups (e.g., industry, research institutions, universities, environmental agencies, NGOs and FBOs) that resulted in open exchange and robust discussions. The contributions of the representatives of FBOs (first-time participants) were considered a highlight of the workshop. Farmers from India, Kenya and Zambia explained the importance of sustainable phosphorus use from their perspective.

The 4th Global TraPs Workshop was hosted by *Office Chérifien des Phosphates* (OCP) – a major phosphate-producing company in the world. OCP's Vice President, Dr. Mohamed Ibnabdeljalil, provided the keynote lecture, a comprehensive multi-scale analysis of the challenges and barriers to sustainable phosphorus management. The workshop agenda included a visit to the Khouribga mining center.

(For a more comprehensive report, see the Special Edition of Global TraPs Newsletter 8, www.bit.ly/GTnewsletter8).

Approximately 100 participants took part in the 4th Global TraPs Workshop.

VFRC

Virtual Fertilizer Research Center

VFRC Moves From Concept to Action

Participants in the recent meeting of the VFRC board of advisors included (from left to right): Sanjib Choudhuri, VFRC executive director; Dr. Julie Howard, chief scientist with USAID; Dr. Jimmy Cheek, chairman of the VFRC board of advisors; and Dr. Amit Roy, IFDC president and CEO.

The Virtual Fertilizer Research Center (VFRC) has made the transition from concept to action by establishing its office in Washington, D.C., and gaining approval of its first round of research grants from its board of advisors (BoA) at their July meeting. Further activities are now underway to achieve the VFRC's vision of assuring smallholder farmers in developing regions affordable and environmentally sustainable soil fertility at a time of growing uncertainty in vital natural resources.

Mission and Vision

The VFRC was created because of the challenging yield requirements of smallholder farmers in developing regions and the need to update fertilizers and fertilizer production technologies that are clearly not serving their needs. The solution to food security in developing regions lies with smallholder farmers, even if their issues are different in various areas.

To enable smallholder farmers to intensify their agricultural production, a new generation of 'smart fertilizers' is required as well as precision fertilization techniques with a regional prioritization.

"Food security formerly meant that people had enough food to eat," VFRC Executive Director Sanjib Choudhuri said. "We no longer have the luxury of such a simple notion. Achieving global food security must go beyond just supplying enough food. It must include smallholder farmers' access to input and output markets, nutrition delivery to the population, producing quality food while being stewards of the environment and achieving a viable and sustainable agricultural economy."

To achieve food security, fertilizers for use in tropical and subtropical zones must be improved with greater nutrient use efficiency (NUE) and include added micronutrients that are necessary for plant growth and human nutrition. Fertilizer production techniques and equipment also must be improved. To achieve sustainable agricultural technologies, advancements must come from plant and soil sciences, material and physical sciences, as well as analytics and mapping.

Organization

Following Choudhuri's appointment as executive director at its October 2011 BoA meeting, the VFRC now has a fully operational office in Washington, D.C. IFDC's Dr. Upendra Singh is serving as the interim VFRC science officer; Antyama Massada is the administrative coordinator; and Jack Giovo is leading the VFRC communications effort.

Outreach

The BoA discussed ongoing outreach to the academic, research and agribusiness communities. That outreach began with the publication of the VFRC's "Blueprint for Global Food Security" and the establishment of its website (www.vfrc.org) to promote the goals of the organization and reach out to potential research and commercial partners. Choudhuri also attended meetings and conferences in Canada, China, India, Israel and the United States to generate interest in the target research areas. The VFRC will continue to take its message to partner organizations and university and private researchers across the globe to further its search for new technologies that lead to improved soil fertility and plant nutrition.

The solution to food security in developing regions lies with the smallholder farmer, even if the issues are different in various areas.

Research Grants

The VFRC has established a mechanism for fresh research and commercialization of new technologies to address gaps in solutions available to smallholder farmers. This process will help improve and sustain proper soil fertility. To achieve its mission, the VFRC is mobilizing public-private collaboration to develop and introduce innovative, environmentally sound technological solutions to build and maintain soil fertility and health essential for commercially viable smallholder farming in developing regions.

To kick-start the research efforts, the VFRC identified initial long-term technology deliverables such as achieving higher NUE, improved micronutrient delivery, nutrient application accuracy, increased local fertilizer supply and improved or alternative sourcing of fertilizers.

Specific short-term priorities were established and requests for proposals (RFPs) were issued in March 2012 to the global scientific, research and agribusiness communities. The RFPs and subsequent grants target achieving higher nitrogen use efficiency and improved fertilization techniques, improved delivery of zinc-infused fertilizers, rapid on-site detection of fertilizer quality and a more efficient local supply of nitrogen and phosphate fertilizers.

Looking forward to the VFRC's second wave of RFPs, concepts researched in the initial grants will be further evaluated and examined for potential commercialization as new proposals will be reviewed for additional projects. RFPs will focus on research addressing specific needs in Africa and Asia, phosphate NUE and breakthroughs in sourcing approaches. The VFRC plans to broaden its outreach to include as many researchers, entrepreneurs and private companies as possible.

Strategy

As is often the case with research, development and innovation, discoveries dictate adjustments. This is the situation in which the VFRC finds itself following its initial RFP funding and recent BoA meeting.

The BoA discussed sharpening the VFRC's technology strategy during its July meeting and agreed to more clearly identify critical priorities for achieving global food security in a more complex future and for the unique requirements of different regions. These priorities can guide the urgency and importance of new technology developments that can help address future water scarcity, climate uncertainty and human nutrition needs as well as help develop the potential roles of seed and plant genomes, organic waste recycling, organic fertilizers and peri-urban farming.

VFRC Advancing Research Grants

▲ VFRC Science Committee members (left to right) Dr. Renfang Shen, Dr. Rudy Rabbinge, Ajay Vashee and Dr. Marco Ferroni led the review of proposals received by the VFRC. The VFRC is awarding over $900,000 in research grants to improve the efficiency of smallholder farming in developing regions of the world.

The VFRC is moving forward with its first fertilizer technology development grants following recent BoA approval. Seven projects will receive funding over a three-year period, helping smallholder farmers in developing regions to increase yields more efficiently and sustainably.

A core objective of the recent meeting of the BoA (held in Washington, D.C.) was to review and approve projects selected from the VFRC's first round of RFPs.

Introducing the agenda item at the meeting, Chairman Dr. Jimmy Cheek reminded the board of the key elements of the VFRC's technology sourcing approach. The first priority is mobilizing global public-private collaboration to develop and introduce innovative, environmentally sound technological solutions that build and maintain soil fertility and health essential for commercially viable smallholder farming in developing regions. The second priority is that the VFRC Science and Commercialization committees will oversee the RFP definition and selection stages. Third, specific board-agreed proposal evaluation criteria include innovation of the proposed technology, likelihood of commercial success, partner credentials, funding support requested, quality of work plan and M&E.

Initial RFPs

"Our goal with the initial RFPs was to get researchers working on soil fertility issues that smallholder farmers could benefit from immediately," said Dr. Rudy Rabbinge, chair of the Science Committee. "Longer term, the VFRC will pursue technology solutions that require more 'breakthrough' work to solve problems." Rabbinge brings a wealth of knowledge to the VFRC as the former chair of the Science Council and Partnerships of the Consultative Group on International Agricultural Research (CGIAR). He recently retired from Wageningen University in the Netherlands where he was professor of sustainable development and food security.

Initial RFPs focused on four major benefits to be delivered by new technologies: the improvement of food security and rural prosperity by increasing farm yields, reducing economic waste and generating off-farm employment; preventing unwanted environmental impacts by minimizing losses of applied soil nutrients; improving plant health and human nutrition with more effective delivery of vital micronutrients; and extracting nutrient value from readily available waste streams in novel ways.

Specific technology targets then were established for four RFPs: achieving higher nitrogen use efficiency; improved delivery of zinc; rapid on-site detection of fertilizer quality; and a more efficient local supply of nitrogen and phosphate fertilizers.

The RFPs were widely distributed among private and public sector research organizations around the world to ensure that a range of science and technology communities knew of the opportunities. A combination of direct mailings (to a considerable network of IFDC and BoA contacts) and the VFRC website were used to inform as many as possible.

Projects Receiving VFRC Support

In response to the RFPs, 15 proposals were received from academic and research institutions, entrepreneurs and industry in Bangladesh, Canada, India and the United States. Seven proposals were selected by the Science Committee for final review and further refined to three projects proposed and approved for full development and four proof-of-concept projects. Projects are expected to be ready for commercialization over a 12-48 month period and will receive funding support approaching $1 million. Project partners will add $600,000 in in-kind contributions.

Two projects are focused on increasing crop uptake of urea-delivered nitrogen. The first will develop a more cost-effective controlled release urea suitable for both field and cash crops using specialized formulations and enhanced coatings. The second will develop a powered applicator to accelerate FDP that can be fabricated in developing regions and made available to farmers through rental or as a contracted service.

Two other projects are exploring more accurate, convenient and cost-effective methods to deliver zinc to deficient soils. One will evaluate a high-yield, high-efficiency formulation that can be applied directly or as a coating on macronutrients. The other will focus on a manufacturing process extension that can embed zinc (or other micronutrients) within macronutrient granules in adjustable amounts to match a crop's needs.

Extracting nutrient value from poultry waste streams will be the focus of two projects. The first will confirm the commercial possibility of a biological process to efficiently convert poultry manure (in small- or large-scale quantities) into easily transportable fertilizer with full nutrient value and anti-fungicidal properties. The second will evaluate new fertilizers with slow-release characteristics produced by augmenting commercial fertilizers with nutrients extracted from slaughterhouse wastes.

To combat counterfeit and/or adulterated fertilizer (which can cause financial loss, poor yields and damage to human health and the environment), the final project will seek to develop a rapid and affordable method to check fertilizer quality and composition at the point of sale or delivery. It uses chromatography and digital imaging technology in a portable kit to identify and calibrate nutrient levels in fertilizer solutions against an established database.

During board discussion following the review and approval to fund the projects, Cheek said, "We are moving these initial projects forward and hope to see some relatively quick market impacts. At the same time, we are beginning the process of developing a second wave of RFPs to broaden our reach. Those RFPs will be announced in the coming months."

◤ (Left): Dr. Jimmy Cheek, VFRC chair, discusses the VFRC research grants with board member Dr. Marco Ferroni.
▲ (Right): African leaders and VFRC BoA members Professor Ruth Oniang'o, Ajay Vashee and Assétou Kanouté.

Participants from 11 Countries Attend IFDC Agro-Input Marketing Strategies Training Course

▲ Trainees and instructors visit the Jimmy Sanders, Inc. blending plant in Town Creek, Alabama, USA.

IFDC's second international training and study tour on 'Designing and Implementing Agro-Input Marketing Strategies' was attended by 23 agricultural professionals from 11 countries. First organized in 2010, this year's program was held in the United States from July 23 to August 3. The 10-day program focused on challenges that developing countries and transitioning economies face in the supply and marketing of agro-inputs in liberalized, open and competitive markets and on the development of practical techniques and skills necessary for customer-oriented marketing.

Trainees included representatives of private agribusiness companies, ministries of agriculture and research and donor organizations. A distinct program benefit was the opportunity for participants to network and learn about agricultural market situations in both developing and developed countries.

The training consisted of classroom lectures and field trips to observe supply and marketing activities in the United States. Participants visited IFDC headquarters in Muscle Shoals, Alabama; agricultural input suppliers and dealers, farms and logistics management business operations in Alabama and the midwestern United States; and policymakers and national associations in Washington, D.C.

"This was a very informative workshop for the participants. IFDC not only created awareness of its activities to improve food security in developing countries but also its efforts to assist value chain members to understand the global environment in which they operate," said Dr. Joshua Ariga, IFDC scientist-economics and a technical instructor for the program.

While in Alabama, participants visited Jimmy Sanders, Inc., one of the largest agro-input supply and distribution businesses in the mid-south region. With 75 locations in eight states, Sanders' operations include seed production and sales, agricultural chemical distribution, bulk handling of fertilizer, variable rate technology and other precision agriculture services. Additional field trips included: Isbell Farms in Cherokee, Alabama; Crop Production Services in Owensboro, Kentucky; Monsanto Company in St. Louis, Missouri; and The Fertilizer Institute in Washington, D.C. Participants were given the opportunity to establish contacts with 19 U.S.-based organizations involved in agro-inputs.

"Being in such a diverse group of people from so many different countries…opens my mind to a lot of possibilities and gives me a new perspective on the future of agricultural business and inputs in general," said Caleb Usoh, manager of business development at Notore Chemical Industries Ltd. in Nigeria.

Carly Lee Nzanzu Kasivita, Minister of Agriculture of North Kivu Province in the DRC, plans to use the knowledge he gained from the program to inform others in his country about what he learned, as the central government develops and enhances the country's fertilizer sector. After 20 years of war, the DRC has made rebuilding its agriculture sector a priority. According to Kasivita, the DRC is now allowing agro-dealers to import fertilizers without paying a tax in order to strengthen fertilizer markets and promote private sector growth.

"The training program was very interesting in the sense that I better understand how the international fertilizer market operates," said Muntanga Simalumba, principal agricultural economist and national coordinator of the Zambian Ministry of Agriculture and Livestock's Farmer Input Support Programme. "For the past five or six years that I have been a part of the program I'm coordinating now, I never knew what happened on the international market. But with the knowledge I've collected here, I've already gained some insight into what drives the price of fertilizer."

IFDC will hold the U.S. training and study tour again in 2014. For more information about IFDC training programs, visit www.ifdc.org/Training and/or the IFDC Training Facebook page at www.facebook.com/IfdcTraining. A calendar of the remaining 2012 international training programs is available on the back cover of this publication.

▲ **Robert Bosheers (left, pointing), coordinator of greenhouse and pilot plant services for IFDC, gives training participants an overview of IFDC's pilot plant.**

Linking Farmers to Markets Training Program

▲ Participants and instructors of the Linking Farmers to Markets training course in Burkina Faso.

Based on the success of the November 2011 English-language ‘Linking Farmers to Markets’ course in Ghana, IFDC organized a similar training program for French-speaking participants in Ouagadougou, Burkina Faso, May 14-18. The program had 53 participants from 13 countries (Angola, Benin, Burkina Faso, Cameroon, Chad, Côte d’Ivoire, DRC, Gabon, Madagascar, Mali, Niger, Rwanda and Senegal).

The objectives of the training were to improve the capacities of the participants to analyze farmer-to-market linkages within the context of a specific agricultural environment and its input and output markets and to develop projects or project approaches that can create effective farmer-to-market linkages.

To reach these objectives, the training built on the successful CASE approach that IFDC and partner organizations developed to organize and empower farmers and to effectively link them to both input and output markets. IFDC’s CASE solution develops agribusiness clusters in which producer groups become an integral part of commodity value chains. Through support from business development services, linkages among various value chain actors (agro-dealers, producers, storage providers, processors, credit institutions, buyers, etc.) are established to effectively link farmers to markets.

“Profitability and sustainability are key elements of our approach; the underlying concept that ‘all actors in a business cluster are able to generate additional revenue’ is the basis for sustainability, both in economic and environmental terms,” said Timothy Karera, director of IFDC’s Training and Workshop Coordination Unit. “The IFDC approach is farmer-centered and assists farmers and FBOs in identifying and accessing profitable input and output markets and also provides an additional focus on information management.”

Participants rated the training as “very good to excellent.” Frank Mayundo Muyumba from the DRC stated, “I hope IFDC establishes a network of trainers across Africa specializing in this key area. The impact and sustainability that is desperately needed would significantly increase.”

The Ouagadougou program participants raised interest in CASE and IFDC. Most requested that IFDC provide a follow-up of this successful program to capitalize on the lessons learned.

25 Years: IFDC – Committed to Africa

IFDC Training Programs in Africa

Training has been a key mandate for IFDC throughout its history. Since 1974, IFDC has held nearly 700 formal workshops, study tours and training programs for nearly 10,000 participants from 150 countries.

IFDC helps build human capacity because knowledge and skills are critical to the efforts of developing and transitional countries to meet the challenges of privatization, globalization and market development. Training is essential to improve the capacity of these countries to compete in world markets for goods and services and to promote meaningful employment in agriculture and agribusiness.

IFDC has also provided training to millions of farmers on four continents through its project-related field training activities.

This article focuses on some of the formal training sessions held during IFDC's first two decades that either took place in Africa or held Africa as a focus.

Fertilizer Use in the Tropics

The first formal IFDC training course in Africa occurred November 20-December 8, 1978, and was a cooperative effort with the International Institute of Tropical Agriculture (IITA). The three-week course was held at IITA's campus in Ibadan, Nigeria. The training was for "workers engaged in fertilizer research and extension on food crops in tropical Africa, Asia and Latin America." Participants from 13 countries attended.

The course covered theoretical and practical aspects of fertilizer use and was designed to help participants develop improved skills in the planning and execution of fertilizer trials at experiment stations and on farmers' fields. The course included instruction on field plot techniques, analytical methods, statistical analysis, the chemistry and fertility of soils and experimental fertilizers. Training was divided between classroom instruction and laboratory, greenhouse and field practice.

FERITT Programs

IFDC and IITA conducted IFDC's second Africa-based training and first Fertilizer Efficiency Research in the Tropics Training (FERITT) program. It was held November 24-December 11, 1980, at the University of Nairobi's College of Agriculture.

The course was for agriculture workers engaged in fertilizer efficiency research. Objectives were to: develop and improve their skills in conducting fertilizer trials at experiment stations and on farmers' fields; impart the techniques to process, analyze and interpret data generated by trials; and improve abilities to test new and existing fertilizers using the latest procedures in field research situations.

Course content dealt with theoretical and practical aspects of fertilizer efficiency research. Procedures for conducting trials with new or improved fertilizer materials and application techniques and agronomic, economic and statistical analysis of results were emphasized. The course used classroom instruction and practical field situations, a pattern still used by IFDC in its training courses.

Scientists from IFDC, IITA and the University of Nairobi comprised the core faculty, supplemented by experts from FAO, USAID and Kenyan crop institutes.

Rainforest Region Hosts FERITT

Through a misty haze, rolling hills dotted with palm trees were visible in a region where a tropical rainforest blends with the savanna. This was the setting at IITA's campus in Ibadan, Nigeria, for the second FERITT course, November 2-20, 1981.

IFDC and IITA scientists served as faculty. Dr. Ray Diamond, IFDC coordinator-fertilizer evaluations, was the program coordinator. Other IFDC faculty were: Lewis Williams, regional coordinator-Africa; Dr. H.R. Tejeda, agronomist-statistician; Pierre Rosseau, tropical agronomist; and two IFDC sabbatical alumni – Dr. J.A. Ekpere, a lecturer at

the University of Ibadan; and Dr. Olu Osiname, a soil scientist at the University of Ife. Dr. B.T. Kang coordinated IITA's technical contribution while Dr. W.H. Reeves coordinated training support.

Twenty-seven participants from 13 African countries and one from Malaysia participated and presented information about their organizations' agricultural research programs. "They emphasized the effects research has on agricultural production and the fertilizer industry," Williams said. "In the process, they analyzed the programs and decided what improvements should be made."

As in the previous FERITT course, fertilizer trials had been pre-planted so that the students could harvest the crop and analyze the resulting data.

Fertilizer Marketing Training

IFDC conducted its first fertilizer marketing training for Africa at the University of lbadan (Nigeria) in August 1982. Co-sponsored by the university, the program served 16 participants from Nigeria, Sierra Leone, Sudan, Swaziland and Upper Volta (now Burkina Faso).

Williams, the program manager, was assisted by Dr. K.J. Byrnes, sociologist, and Dr. Y.H. Chuang, market development economist. Presentations were made by former IFDC staff members: Dr. A.O. Falusi and Ekpere of the University of Ibadan and Osiname of the University of Ife. Falusi lectured on 'Fertilizer Marketing in Nigeria' and 'Fertilizer Legislation for Developing Countries.' Ekpere lectured on 'Extension Methods for Marketing' and 'Effective Fertilizer Credit Programs.' Osiname presented 'The Essential Elements and Their Role in Plant Growth' and 'Nutrient Requirements of Maize, Sorghum and Millet.'

Lectures were also presented by IITA staff. Dr. B.N. Okigbo, IITA deputy director, spoke on farming systems for tropical agriculture. Kang discussed soil fertility and nutritional problems inherent in crop production in the tropics.

Two field trips added a practical aspect to the program. The first was to IITA where Dr. Paul Vlek, IFDC visiting soil scientist, discussed IFDC's West African nitrogen program and participants received an overview of IITA research programs. The second field trip was to Oyo State to study the agro-service marketing system.

The theme of this training program was 'Attacking the First Limiting Factor of a Marketing System.' "By the end of the program, participants were aware of all of the components of a marketing system, and understood the interrelationship of these elements," Williams said.

"Participants learned that if any of these elements are inadequate, it becomes a limiting factor to the marketing system. The marketing chain is just as strong as the weakest link," added Chuang.

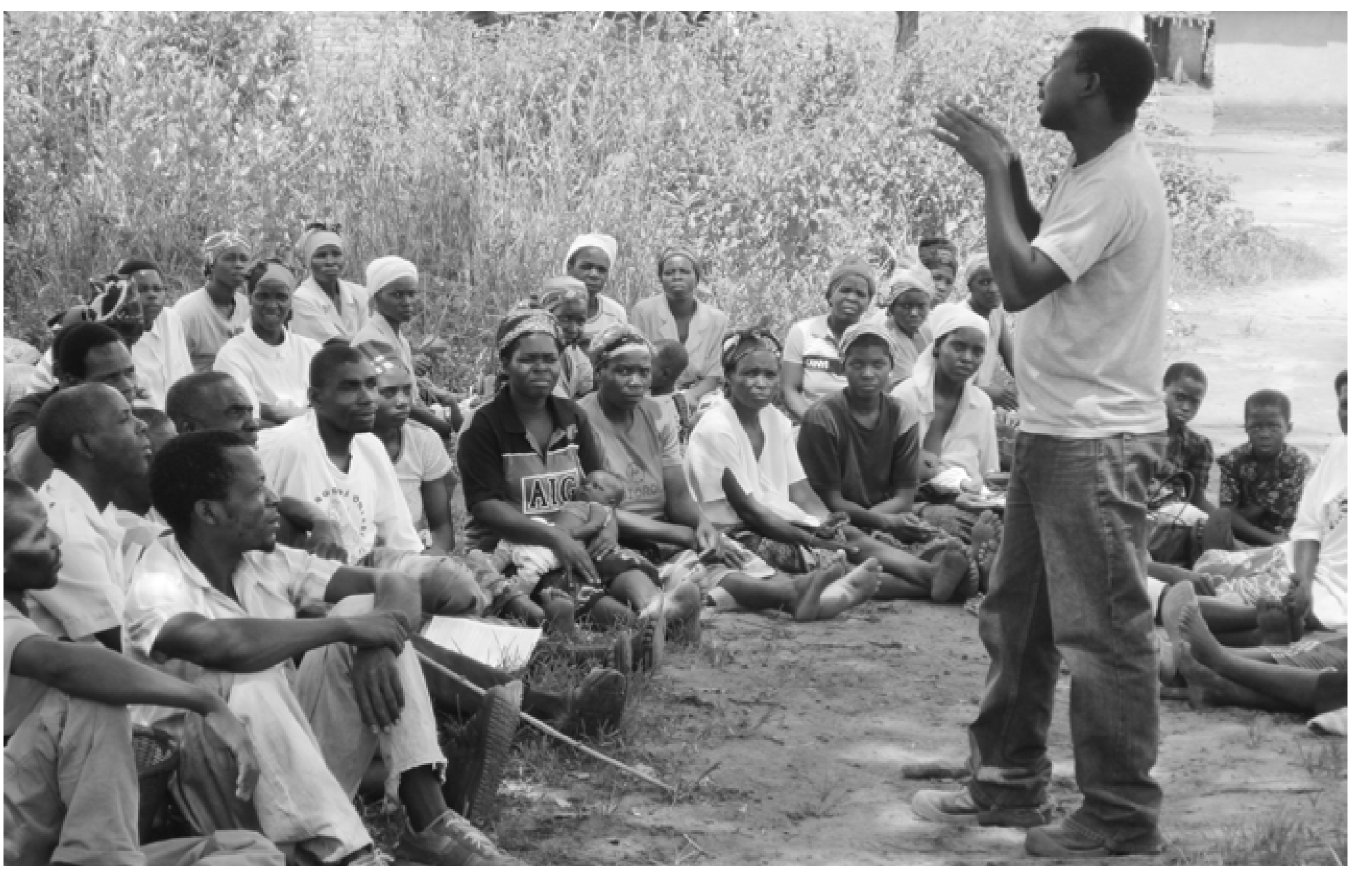
Case studies were used to apply concepts taught throughout the program. "Case studies generated considerable discussion on the best solution for problems given in the cases," according to Byrnes.

The success of the course was affirmed by the fact that two African countries contacted IFDC to request country-specific programs.

World Bank Executive Addresses Marketing Training Group

A marketing training program at IFDC headquarters in late 1982 highlighted that some developing nations were making progress in eliminating government control of fertilizer marketing. According to Amar Jit S. Sodhi, an agricultural economist with the African Projects section of the World Bank, the trend encouraged the development of more modern, effective marketing systems in developing countries.

Drawing on experience from his native India and also Nigeria as examples, Sodhi showed how reducing government's role can encourage the establishment of a commercial fertilizer system, and thus the more efficient use of fertilizer.



Sodhi discussed two key aspects of the countries' marketing systems – the method of assessing fertilizer requirements and fertilizer retailing systems. "Like many developing countries, the goal of agricultural policy in India and Nigeria is 'self-sufficiency' in the production of food grains and other crops, with the widest possible participation of smallholders," Sodhi said. "Both recognize that major increases in agricultural production have to come primarily through increased yields per hectare, as the net sown area is expected to increase only marginally. The food strategies mission in Nigeria visualized 60 percent of the incremental production coming from the use of additional fertilizers. The International Food Policy Research Institute (IFPRI) estimated that between 1970 and 1974, about 50 percent of incremental food production in India resulted from fertilizer use."

According to Sodhi, in both India and Nigeria (like many other developing countries), the evolution of the fertilizer marketing system was not powered by the free play of market forces; in fact, a series of government interventions shaped these systems.

In India, the government took over the responsibility in 1944 by establishing a Central Fertilizer Pool to ensure equitable distribution of available fertilizer at fair prices. However, to encourage private investment, the government announced a new policy in 1966, under which domestic fertilizer manufacturers were allowed to market their own products. "It was a watershed in the history of fertilizer," Sodhi said. "This decision encouraged a growing number of fertilizer manufacturers to develop modern and sophisticated marketing systems."

In Nigeria, fertilizer marketing was handled exclusively by the government. Before 1976 the importation and marketing of fertilizers were handled by each state government, but these activities were centralized under the federal Ministry of Agriculture (MoA). Because of systemic constraints, the government began to commercialize its fertilizer marketing.

With an extensive background in agriculture and economics, Sodhi helped to broaden the outlook of the marketing management training participants. He began working for the Government of India in 1958, and served in various capacities before he was selected to head India's extension organization in 1968. Sodhi further served his country as managing director of the National Seeds Corporation, the largest seed-producing enterprise in India, and also as credit director for the MoA. For four years prior to his World Bank appointment, he served as joint secretary of the MoA.

Priorities for Fertilizer Policy Research in Tropical Africa

Research priorities regarding fertilizer supply- and demand-related issues were established during a 'Workshop on Fertilizer Policy in Tropical Africa,' conducted in Lomé, Togo, in April 1988.

The workshop, co-sponsored by IFDC and IFPRI, was attended by 34 delegates representing 12 countries and seven organizations. Delegates came from Benin, Cameroon, Côte d'Ivoire, Ghana, Kenya, Malawi, Nigeria, Senegal, Togo, Zaire (now DRC), Zambia and Zimbabwe. Organizations included the *Centro Internacional de Mejoramiento de Maiz y Trigo* (CIMMYT), *the Comite Permanent Inter-Etats de Lutte Contre la Secheresse dans le Sahel* (CILSS), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), IITA and USAID.

The workshop objective was to collect policymakers' and researchers' recommendations on the major constraints to increased fertilizer use in their countries. Scholars, researchers and policy analysts from international institutions and donor agencies also shared their experiences and interacted with delegates on the broad problems confronting the development of the fertilizer sector in SSA.

Delegates presented papers outlining their countries' fertilizer policies and the problems confronting the sector. They also delineated key recommendations regarding fertilizer supply- and demand-related issues. They supported IFDC's efforts toward the creation and management of a regional database on fertilizer-related issues to encourage the flow of information on fertilizer marketing, research, training and expertise within national and regional institutions.

Regarding fertilizer supplies, the group concentrated on problems related to domestic production and imports. Participants recommended appraisals of existing production facilities, assessments of the potential to produce fertilizers in the region and an appraisal of small-scale fertilizer production potential at the village level. An assessment of regional cooperation among countries in importing high-grade fertilizers in bulk, an analysis of all aspects of fertilizer cost reductions and the training of experts in international markets were also recommended.

Regarding privatization, an assessment of institutional arrangements to best manage fertilizer importation, distribution and marketing was recommended. Concerning demand-related issues, the group concluded that there was a lack of data on the physical response to fertilizer, the economic environment, farmers' decision-making processes, the status of extension and soil fertility maintenance.

The recommendations supported IFDC's work and were expected to form the core of IFDC-IFPRI research leading to further refinements of fertilizer policies in SSA.

West African Agro-Minerals

A West African geology network was established at a workshop in Lomé, Togo, during April 1988. Its purpose was to study regional agro-mineral deposits including agricultural limestone and dolomite, phosphate, potash and sulfur. Network objectives were to: identify and document occurrences of agro-mineral raw materials within the region; develop the special geological skills required to locate and evaluate these resources; distribute information and encourage cooperation between regional scientists and participating organizations; and ascertain the potential for using local raw materials in the production of fertilizers to increase food production in the region.

The workshop was presented by IFDC and *Bundesanstalt für Geowissenschaften und Rohstoffe* of Hannover, Germany; 18 geologists from nine West African countries participated. The workshop was part of an ongoing agro-minerals research program coordinated by IFDC and funded by *Der Bundesminister für Wirtschaftliche Zusammenarbeit* (BMZ). Topics discussed included: West African geology; the region's nonmetallic minerals; an overview of phosphate deposits in West Africa; and the use of indigenous agro-minerals for direct application and fertilizer production.

IFDC staff leading the workshop were Dr. Guerry H. McClellan, research coordinator; Steven Van Kauwenbergh, mineralogist/petrographer; Dr. Ampah Kodjo Johnson, Africa Division geologist; Terry Frederick, Africa Division training coordinator; and Dr. Paul Vlek, Africa Division director. Observers came from the *Deutsche Gesellschaft für Technische Zusammenarbeit* (GTZ) and Togo's *Office de la Recherche Scientifique et Technique de Outre-Mer*. A practical viewpoint was gained through field tours to the *Office Togolais des Phosphates* mine at Kpogame and its beneficiation facility.

IFDC/UNDP Workshop

UNDP co-sponsored 'Fertilizer Sector Development and Agricultural Production in Selected Countries of the Mediterranean, Middle East and North Africa' at IFDC headquarters during May 1989. The goal was to assist target countries to accelerate food production by removing or relaxing supply and demand constraints to increased and more efficient use of fertilizer. This was accomplished by identifying impediments to and suggesting strategies and programs for promoting fertilizer sector development consistent with national and regional agricultural development objectives and plans.

The workshop's purpose was to formulate strategy guidelines for strengthening fertilizer research, extension, supply and marketing systems. Programs were also developed to transfer information needed to hasten the adoption of more efficient fertilizer and fertilizer use technologies by farmers.

These issues were addressed in devising the guidelines: relevance of existing soil fertility and fertilizer-related research and extension programs to farm-level needs; factors impacting socio-economic conditions of farmers and the use of fertilizer and other agro-inputs; development of more effective national fertilizer sectors through the integration of research, extension, supply and marketing strategies; and training requirements for developing and implementing sound fertilizer production, procurement, marketing, distribution and use-related programs.

The workshop attracted 24 delegates from 18 countries including Algeria, Egypt, Morocco, Somalia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen. Country profiles, presented by the delegates, examined the current situation and outlook for agriculture and fertilizer sector development. The profiles focused on the fertilizer supply and constraints that impede the expanded and more efficient use of fertilizer.

Delegates and faculty prepared suggested strategies to speed the development and improve the performance of fertilizer sectors in three areas: fertilizer use – increasing use and use efficiency; fertilizer supply – developing appropriate and efficient supply sources; and fertilizer marketing and distribution – determining/satisfying farm-level demand.

The findings were presented at a plenary session. In addition to formal sessions, the workshop featured field trips to offer delegates a practical view of various aspects of fertilizer sector development and operations in the United States.

IFDC Updates its Strategic Plan

The global agriculture sector and agricultural development have undergone massive changes in the last five years. The global economic crisis in 2007-2008 (leading to steep price increases in oil, food and fertilizers) impacted millions in the developed and developing world and, in many ways, is still being felt. On a more positive note, a number of countries, organizations and institutions have increased funding for, and attention to, agricultural development.

Because of these global events and IFDC's rapid growth over the past few years, the Center's board of directors made the decision in 2011 to review and revise its strategic plan.

IFDC's priority remains to help smallholder farmers in developing regions move from subsistence to commercial farming and to escape poverty. IFDC also remains committed to helping developing economies increase their agricultural productivity, food security and the nutritional health of their people while protecting the environment.

Among the key points found in the document are:

Key Objectives

- Pioneer and catalyze improved plant nutrient performance by developing and disseminating new technologies and practices to smallholder farmers using a range of innovative delivery mechanisms.
- Strengthen input and output markets for the benefit of smallholder farmers.

Strategic Intervention Areas

- Develop more efficient fertilizer products.
- Improve nutrient use practices for better economic and environmental outcomes.
- Improve efficiency of input markets.
- Improve management capability and profitability of farm enterprises.
- Strengthen and support robust output markets.
- Analyze, inform and influence policy reform.

IFDC's updated strategic plan can be found on the IFDC website at www.bit.ly/MyLdYr.

2012 IFDC Africa Committee Meeting

During the 2012 Africa Committee meeting (held in Accra, Ghana, June 25-27), members of the committee and IFDC staff visit Tema Chemicals Limited, which specializes in the formulation and distribution of fertilizers. From left to right are Dr. Vo-Tong Xuan, Gerard Doornbos, Dr. Mohamed Badraoui, Pat Murphy, Dr. Amit Roy, Dr. John Hardman, Dr. Kofi Debrah, Dr. Andre de Jager and Japhet Lartey. They are standing in front of a 'mountain' of fertilizer in one of Tema's warehouses.

Dr. Kofi Debrah (IFDC country representative in Ghana and chief of party of the USAID West Africa Fertilizer Program), board member Pat Murphy and Dr. Andre de Jager (NWAFD director) review a schematic of fertilizer composition during the visit to Tema Chemicals.

IFDC staff, members of the Africa Committee of the board of directors and executives of Tema Chemicals Limited/Chemico Limited pose for a photograph near the entrance to the Tema facility. IFDC is grateful to Alphonse Adjavon (CEO) and K.K. Donkoh (deputy CEO) for their hospitality and the information they provided to the IFDC Africa Committee.

Dr. Jimmy Cheek Elected to the IFDC Board of Directors

Dr. Jimmy G. Cheek, chancellor of the University of Tennessee (UT), Knoxville, was elected to a three-year term on the IFDC board of directors, effective June 18, 2012. Cheek also serves as the chairman of the board of advisors of the VFRC, a position he has held since its inception in 2010. The VFRC is an innovative global research initiative established under the auspices of IFDC.

"The VFRC's work is critically important, and the work of IFDC is equally important," Cheek commented. "I look forward to working with the other board members of IFDC and its staff as they help smallholder farmers increase their agricultural productivity and incomes while also decreasing negative environmental impacts."

Cheek became the seventh chancellor of UT on February 1, 2009. Through his leadership, the campus is focused on improving students' educational experiences, enhancing faculty research and scholarship as well as outreach and service. A first-generation college student, Cheek has set in motion several initiatives to broaden the university's diversity and student access.

As the state's flagship research campus, UT is ranked as a Top 50 public institution. In early 2010, UT began its quest to become one of the Top 25 public research universities in the nation. The effort has helped solidify strategies to grow the research base and graduate programs, improve graduation rates and attract and retain top faculty.

Cheek serves on the board of directors of the Association of Public and Land-Grant Universities (APLU), chairs the association's Commission on Food, Environment and Renewable Resources and is a member of the APLU Presidential Advisory Committee on Energy. He serves on the UT-Battelle board of governors, the UT Health Sciences Center board of directors and the UT Athletics board of directors.

M. Peter McPherson is president of the APLU, chair of the IFDC board of directors and a member of the VFRC board of advisors. He stated, "Dr. Jimmy Cheek has shown great leadership in his roles with the VFRC and APLU. I am certain he will be an asset to IFDC as a member of its board of directors."

Prior to his appointment as chancellor, Cheek was a faculty member and an administrator at the University of Florida for 34 years, last serving as senior vice president of Agricultural and Natural Resources. He was named to the Academy of Teaching Excellence in 2008, a Fellow of the American Association for Agricultural Education in 2005 and a Fellow of the North American Colleges and Teachers of Agriculture in 1998. His research has focused on the influence of experiential learning on student achievement and educational accountability. He has authored more than 80 journal articles and reports and is the senior author of the book *Effective Oral Communication*.

Cheek earned his bachelor's degree with high honors and his doctorate from Texas A&M University. He received his master's degree from Lamar University.

Dr. Steven Leath Elected to the IFDC Board of Directors

Dr. Steven Leath, president of Iowa State University (ISU), was elected to a three-year term on the IFDC board of directors, effective August 1, 2012.

"On behalf of IFDC, I welcome Dr. Leath to its board of directors," said IFDC's President and Chief Executive Officer Dr. Amit H. Roy. "He brings expertise in plant science and proven executive leadership abilities. In addition, Iowa State University is an exceptional center of research and extension and its graduates serve across the developing world."

Leath became the 15th president of ISU in January 2012. He served at three universities in teaching, research and economic development posts en route to the ISU presidency. Leath came to Iowa State from North Carolina where he was a faculty member, research program leader and high-level administrator with the University of North Carolina (UNC) system and North Carolina State University (NCSU).

ISU is home to five U.S. Department of Agriculture (USDA) research laboratories; the nation's finest genomic-based agricultural breeding programs; and world-renowned plant science and bio-economy institutes. The College of Agriculture and Life Sciences has 150 years of excellence in agricultural research, education and extension. Key focus areas include food and human nutrition research and preserving natural resources for future generations.

At an open forum on the ISU campus following his selection, Leath stated, "I want to make this land-grant university greater than it already is." He further stated that he wanted to create a viable Iowa State brand and strengthen the sense of community both in the United States and abroad.

From 2007 to 2012, Leath was vice president for research for the UNC General Administration. In that position, he promoted research and sponsored programs across the full spectrum of academic disciplines and interdisciplinary activities carried out by UNC's 16 university campuses. He increased levels of external support from federal, state and private sources and worked closely with campus research administrators to develop research and sponsor program activity to support the mission of each campus. In 2012, the UNC campuses attracted nearly $1.4 billion in competitive research grants and contracts, primarily from the federal government. Leath also oversaw UNC's inter-institutional centers and was one of the leaders in such highly successful PPPs as the North Carolina Centennial Campus, North Carolina Research Campus, Research Triangle Park and the David H. Murdock Research Institute, which he helped to establish and led as chief executive officer until joining ISU.

Leath joined the faculty of NCSU's College of Agriculture and Life Sciences in 1985 as a plant pathologist with the USDA's Agricultural Research Service (ARS) unit based on the NCSU campus. He was named professor and research leader of the unit in 1998, then served as acting national grain crops program leader for USDA/ARS in Washington, D.C. He returned to NCSU in 2001 as a professor and assistant director of the North Carolina Agricultural Research Service (NCARS), was promoted to associate director in 2003 and was named NCARS director and associate dean of the College of Agriculture and Life Sciences in 2005.

Leath earned a bachelor's degree in plant science from Pennsylvania State University, a master's degree in plant science from the University of Delaware and a doctorate in plant pathology from the University of Illinois. After receiving his doctorate, he spent one year as an extension plant pathologist in Illinois. During his research career, Leath published nearly 100 scientific articles on plant disease resistance, plant pathology, plant breeding and related fields.

Leath serves on the Iowa STEM (Science, Technology, Engineering, Mathematics) Advisory Council and is a member of the executive committee of the Greater Des Moines Committee's Capital Crossroads Implementation Committee, a board member of the Iowa 4-H Foundation and a member of the Iowa Business Council. He also is a member of the American Association for the Advancement of Science, Crop Science Society of America and American Phytopathological Society.

"I am pleased to join the IFDC board of directors and look forward to working on methods to improve plant health and the lives of smallholder farmers," Leath said.

In Memoriam

Dr. Paul J. Stangel, IFDC President and CEO (1990-1992)

The IFDC staff and board of directors were deeply saddened by the passing of Dr. Paul J. Stangel, former IFDC president and chief executive officer, on June 26, 2012, at the age of 82.

Stangel was part of the initial team that began IFDC in 1974. While still employed with the Tennessee Valley Authority (TVA) and serving as acting director of TVA's international staff, Stangel worked closely with IFDC's first managing director, Dr. Donald L. McCune, in planning IFDC's establishment. He joined IFDC in mid-1975, serving as director of the Outreach Division, focusing on technology transfer, technical assistance, human capacity building and market development. In 1976, Stangel was named deputy managing director of programs in which he helped shape many of the Center's research programs. He traveled extensively and cultivated many of the collaborative relationships that IFDC has today with other international development organizations. In 1990, Stangel was named IFDC's president and chief executive officer and served in that capacity until his retirement in 1992.

Stangel earned a doctorate in soil chemistry from the University of Wisconsin (UW) School of Agriculture. He began his career in agricultural development with TVA and later returned to UW, serving as an assistant professor from 1964 to 1966. Following three years with the International Minerals Corporation, he joined TVA's international staff from 1969 to 1975.

"Dr. Stangel's dedication and service to improving life for the world's impoverished populations through research and technology were an inspiration to all who worked with him," said Dr. Amit Roy, IFDC president and CEO. "He was a man of great enthusiasm, ideas and action and was always willing to share his time and knowledge."

Activities of the 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:

Dr. Mohamed Badraoui, director general of Morocco's National Agronomic Research Institute, participated in a workshop during the inaugural meeting of the Global Food Security Forum (GFSF) in Rabat, Morocco. The workshop, "Inside the Farm Gate: Helping Smallholders and Commercial Farmers," was moderated by **Dr. Vo-Tong Xuan**, rector of Tan Tao University in Vietnam. Badraoui is a member of the GFSF advisory board. He has been a member of the IFDC board of directors since January 2012 and serves on the board's Africa Committee. Xuan has been a member of the IFDC board of directors since 2007. He chairs the board's Program Committee and is a member of the Executive, Africa, Budget and Nomination committees.

In July, **Margaret Catley-Carlson**, patron of the Global Water Partnership (GWP) and member of the United Nations Secretary General's Advisory Board on Water and Sanitation, gave a keynote lecture on "The Water-Food-Energy Nexus in Asian Cities" at the National University of Singapore during Singapore International Water Week 2012. She also participated in a panel discussion on "Innovative Solutions for Managing Urban Water Catchments and Floods: Lessons from Good Practices for Policy Makers," organized by the Japan International Cooperation Agency and the National University of Singapore. In August, Catley-Carlson delivered the second annual GWP lecture "The Future of Water" during World Water Week in Stockholm. 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. Josué Dioné, director of Food Security and Sustainable Development at the United Nations Economic Commission for Africa (UNECA), participated in a side event of the UN Conference on Sustainable Development (Rio+20) in June. Dioné gave a presentation on "Strengthening Institutional Frameworks for Sustainable Development," in which he discussed integrating the social, environmental and economic pillars of sustainable development. The event was hosted by the UNECA Food Security and Sustainable Development Division. Dioné also participated in another side event on financing sustainable development. He has been a member of the IFDC board of directors since 2011 and serves on the board's Africa Committee.

Kilimo Salama ('Safe Agriculture'), a micro-insurance program for Kenyan farmers, is a partnership between the Syngenta Foundation for Sustainable Agriculture, UAP Insurance and telecommunications company Safaricom. The program recently won the *Financial Times*' award for Technology in Sustainable Finance. According to **Dr. Marco Ferroni**, director of the Syngenta Foundation, "When it comes to drought, most farmers have no choice but to simply pray for rain. And if the rains don't come, the crops don't grow. At a time of global climate change, *Kilimo Salama* is giving farmers more options so they can meet these challenges and prosper." Ferroni has been a member of the VFRC board of advisors since 2010 and serves on the Science Committee.

In June, **Dr. Rudy Rabbinge**, Wageningen University professor emeritus of sustainable development and food security, participated in the Food First Conference "Investing in Food Security and Food Markets in Africa" in Venlo, the Netherlands. Rabbinge gave a keynote speech in which he discussed the promise, potential and progress of increased food security in Africa. Rabbinge also participated in AquaVision 2012 in Stavanger, Norway, where he discussed the importance of aquaculture to food security. Rabbinge has been a member of the VFRC board of advisors since 2010 and serves as chair of the Science Committee and vice chair of the Executive Committee. Previously, Rabbinge served on the IFDC board of directors from 1996 to 2006.

Dr. A.K. Singh, deputy director general of the Natural Resource Management Division of the Indian Council of Agricultural Research (ICAR), spoke during the first annual workshop of the National Initiative on Climate-Resilient Agriculture (NICRA) in June. NICRA is an ICAR initiative to increase the resilience of Indian agriculture to climate change and climate variability through strategic research and technology demonstration. Singh also made a presentation on the status of "Customized Fertilizer and Soil Fertility Mapping" during the Governing Body Meeting of ICAR. Singh has been a member of the VFRC board of advisors since 2010.

In July, Africa Union Commissioner for Rural Economy and Agriculture **H.E. Rhoda Peace Tumusiime** was re-elected and reappointed to that position for another term. In June, 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," said Tumusiime. "The private sector engagement and the full participation of non-state actors in the sector is a pre-requisite for a sustainable production base." In May, Tumusiime attended the Symposium on Global Agriculture and Food Security at the Chicago Council on Global Affairs in Washington, D.C., where U.S. President Barack Obama announced the New Alliance for Food Security and Nutrition. Tumusiime has served on IFDC's board of directors since 2010 and is a member of the board's Africa Committee.

IFDC Staff News

Dr. Sampson Agyin-Birikorang, IFDC scientist-systems agronomist, will present "Can Controlled-Release Phosphate Fertilizer Improve Phosphorus Efficiency?" at the annual meetings of the American Society of Agronomy, Crop Science Society of America and Soil Science Society of America. Co-authors of the paper are **Dr. Upendra Singh**, principal scientist-systems modeling (soil fertility); **Dr. Joaquin Sanabria**, scientist-biometrician; and **Wendie Bible**, senior laboratory analyst. Singh and Sanabria also will present papers during the meetings. Singh will present "Minimizing Nitrogen Losses from Cropping Systems: Effectiveness of Organically Enhanced Nitrogen Fertilizer," co-authored by Sanabria; **Dr. Rick Austin**, coordinator of analytical services; Agyin-Birikorang; and Bible. Sanabria will present "Multivariate and Non-Parametric Methods for Identification of Factors that Decide the Adoption of Fertilizer Use by Rwandan Farmers," co-authored by **Dr. Joshua Ariga**, scientist-economics; **Dr. Deborah Hellums**, senior program support specialist and leader of the IFDC Agro-Economics Research Program; and **Martin Drevon**, chief of party of the PReFER project.

In May, **André de Groote**, project coordinator of IFDC's Sustainable Energy Production through Woodlots and Agroforestry (SEW) project and IFDC representative in Burundi, participated in a panel discussion on "Bio-energy for the 21st Century" during the First Stakeholder Forum of the Africa-European Union Energy Partnership in Cape Town, South Africa. In June, de Groote attended the Agroforestry Regional Congress in the DRC, a joint event organized by SEW and the Ministry of Environment of North Kivu.

Dr. Asseta Diallo, IFDC regional coordinator of agribusiness clusters, participated in the African Development Bank Group annual meetings in Arusha, Tanzania, in May. The theme of the event was "Africa and the Emerging Global Landscape: Challenges and Opportunities." Attendees represented finance, banking, government, economics, donors, media, civil society, development and academia.

Rob Groot, director of IFDC's East and Southern Africa Division (ESAFD), presented a paper on fertilizer demand prospects in SSA during the IFA annual conference in May in Doha, Qatar. **Patrice Annequin**, market information specialist, updated IFA's Africa Forum on progress concerning the web portal AfricaFertilizer.org. **John Wendt**, leader of ESAFD's Natural Resource Management Program, also participated in the conference.

During August, **Aimé Kikuru**, SEW national value chain officer, and **Anselme Vwambale**, an IFDC consultant on improved stoves, attended the Aprovecho Research Center's 2012 Stove Camp in Oregon, USA. The camp brings together researchers, engineers, development workers and others to develop improved stoves that produce less pollution. A gasifier stove developed by IFDC in collaboration with the German Agency for International Cooperation (GIZ) won the camp's stove competition.

Dr. Latha Nagarajan, IFDC scientist-economics and Rutgers University research associate, co-wrote with Dr. Carl Pray of Rutgers "Innovation and Research by Private Agribusiness in India," a discussion paper published by IFPRI in May. Funded by a grant to Rutgers from the Bill & Melinda Gates Foundation, the paper measured private research and innovation in India and reviewed Indian policies that influence research and innovation.

In May, **Dr. Amit Roy**, IFDC president and CEO, gave a presentation on "Food Security in Africa: Increasing Productivity with an Agri-Food Chains Approach" during Innovagro's second annual international seminar "Innovation for Family Farming and Food Security" in Buenos Aires, Argentina. Roy's presentation concluded that large-scale productivity increases in Africa are possible with long-term investments from the public and private sectors, an enabling policy environment and investments in infrastructure.

In May, **Dr. Joaquin Sanabria**, IFDC scientist-biometrician, participated in an ECOWAS workshop to validate and discuss two fertilizer quality control manuals for West Africa. Sanabria presented the preliminary results of a fertilizer quality assessment performed by the MIR Plus project in five ECOWAS countries. He also made a presentation describing the physical and chemical analytical methodologies contained in the draft of the fertilizer analytical manual proposed to ECOWAS. Sanabria served as IFDC's MIR Plus representative in the English-speaking group that reviewed the manual during the workshop.

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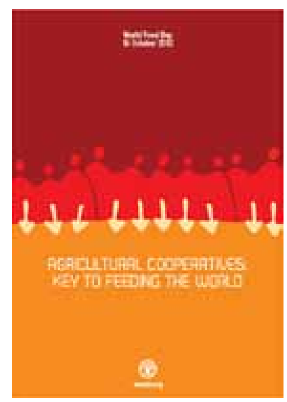
FAO celebrates World Food Day each year on October 16, the date of FAO's founding in 1945. The theme of World Food Day 2012 is "Agricultural Cooperatives: Key to Feeding the World." For more information, see FAO's World Food Day website: www.fao.org/getinvolved/worldfoodday/en.



2012 International Training Calendar

Training Program	Dates	Location	Program Fee (USD)
Decision Support Tools for Agricultural Production, Fertilizer Recommendations and Climatic Variability	October 3-10	Arusha, Tanzania	$1,300
Fertilizer Granulation and NPK Production Alternatives	November 12-16	Bangkok, Thailand	$1,600
Promoting Affordable Sources of Plant Nutrients in Africa Through Innovative Composting Alternatives	December 3-7	Accra, Ghana	$1,300

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