# IFDC Corporate Report 2007/08

**Fertilizer and New Demands: Food, Feed, Fiber—*Now Fuel*!**

# Corporate Report 2007/08

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# Acronyms

| | |
|---|---|
| 1000s+ | From Thousands to Millions |
| AAK | Association of Agribusinessmen of Kyrgyzstan |
| AAT | Agribusiness Association of Tajikistan |
| ABIP | Agribusiness Information Point |
| ABMC | Association and Business Management Center |
| AFADA | Albanian Fertilizer and Agribusiness Dealer Association |
| AGRA | Alliance for a Green Revolution in Africa |
| AIMS | Agricultural Input Markets Strengthening Project |
| AISSA | Agricultural Intensification in Sub-Saharan Africa |
| AMPIA | Associacão Moçambicana de Provedores de Insumos Agropecuarios (Association of Agricultural Input Providers of Mozambique) |
| AND | Agro-Dealer Network Development in Nigeria Project |
| AOPP | Association des Organisations Professionnelles Paysannes (Association of Professional Producers of Mali) |
| APCR | Farmers' Association for Rural Communication |
| APEP | Agricultural Productivity Enhancement Program |
| ASAP | Accelerated Sustainable Agriculture Program |
| ASTI | Agricultural Science, Technology, and Innovation System |
| AU | African Union |
| BSAIDD | Batken and Sughd Agri-Input Dairy Development Project |
| BUNASOLS | Bureau National des Sols (National Office for Soil Research of Burkina Faso) |
| CAADP | Comprehensive Africa Agriculture Development Program |
| CAN | calcium ammonium nitrate |
| CASE | Competitive Agricultural Systems and Enterprises |
| CATALIST | Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability in the Great Lakes Region of Central Africa |
| CBS | Cluster and Business Support |
| CCC | Commodity Credit Corporation |
| CIAT | Centro Internacional de Agricultura Tropical (International Center for Tropical Agriculture) |
| CIMMYT | Centro Internacional de Mejoramiento de Maíz y Trigo (International Maize and Wheat Improvement Center) |
| CNFA | Citizens Network for Foreign Affairs |
| COMESA | Common Market for Eastern and Southern Africa |
| CPIDS | Cereal Production Information and Decsion Support Systems |
| CPP | crop protection product |
| CSD-ISFM | Combating Soil Fertility Decline to Implement Smallholder Agricultural Intensification in Sub-Saharan Africa |
| DAE | Department of Agricultural Extension (Bangladesh) |
| DAI | Development Alternatives, Inc. |
| DAP | diammonium phosphate |
| DGIS | Directorate-General for Development Cooperation |
| DRC | Democratic Republic of the Congo |
| DSSAT | Decision Support System for Agrotechnology Transfer |
| DST | decision support tool |
| EAC | East African Community |
| ECOWAS | Economic Community of West African States |
| ESRI | Environmental System Research Institute |
| F&SAD | Fertilizers and Sustainable Agricultural Development |

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| FARA | Forum for Agricultural Research in Africa |
| FARMS | Food for Agricultural Revitalization and Market Systems |
| FFP | Food for Progress |
| GIS | geographic information system |
| GREFA | Group for Research and Training in Aboriculture and Agriculture |
| IAEA | International Atomic Energy Agency |
| IAR4D | Integrated Agriculture Research for Development |
| IARCs | International Agricultural Research Centers |
| ICAC | International Cotton Advisory Committee |
| ICRISAT | International Crops Research Institute for the Semi-Arid Tropics |
| IFA | International Fertilizer Industry Association |
| IFAD | International Fund for Agricultural Development |
| IFDC | International Center for Soil Fertility and Agricultural Development |
| IFPRI | International Food Policy Research Institute |
| IIAM | Instituto de Investigação Agrária de Moçambique (Agricultural Research Institute of Mozambique) |
| IITA | International Institute of Tropical Agriculture |
| INERA | Institut National d'Etude et des Recherches Agronomiques (Institute for Environment and Agricultural Research in Burkina Faso) |
| INRAB | Institut National des Recherches Agricoles du Benin (National Institute of Agricultural Research of Benin) |
| IPI | International Potash Institute |
| IPM | Integrated Pest Management |
| IPNI | International Plant Nutrition Institute |
| ISFM | Integrated Soil Fertility Management |
| KAED | Kyrgyz Agro-Input Enterprise Development Project |
| KIT | Royal Tropical Institute of the Netherlands |
| KM | knowledge management |
| LCC | Leaf Color Chart |
| MAIL | Ministry of Agriculture, Irrigation, and Livestock (Afghanistan) |
| MARKETS | Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites |
| MIM | Maize Intensification in Mozambique |
| MIR | Marketing Inputs Regionally Project |
| MIS | market information systems |
| MISTOWA | Strengthening Regional Networks of Market Information Systems and Trader Organizations in West Africa |
| MSME | micro, small, and medium enterprises |
| NEPAD | New Partnership for Africa's Development |
| NGO | non-governmental organization |
| NPFS | National Programme for Food Security |
| NRM | Natural Resource Management |
| NuMaSS | Nutrient Management Support System |
| ORIAM | Réseau des Opérateurs d'Intrants Agricoles du Mali (Agricultural Input Traders' Network of Mali) |
| PADL/CLK | Projet d'Appui au Développement Local des Provinces de la Comoé, de la Léraba et du Kénédougou (Local Development Support Project for the Provinces of Comoé, Léraba, and Kénédougou) |
| PAGEFCOM | Projet d'Appui à la Gestion de Forêts Communales (Communal Forest Management Support Project) |
| PCDA | Le Programme Diversification et Compétitivité Agricoles (Agricultural Competitiveness and Diversification Program) |
| PDRDP/BK | Projet de Développement Rural Decentralise et Participatif dans les Provinces du Bazega et du Kadiogo (Decentralized and Participatory Rural Development Project in the Provinces of Bazega and Kadiogo) |
| PDRSO | Projet de Développement Rural du Sud-Ouest du Burkina Faso (Project |

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| | for the Development of the Rural Southwest of Burkina Faso) |
| PLAR | Participatory Learning and Action Research |
| PNM | Precision Nitrogen Management |
| PRDSS | Phosphate Rock Decision Support System |
| PRODEPAM | Programme de Développement de la Production Agricole au Mali (Program for the Development of Agricultural Production in Mali) |
| QUEFTS | Quantitative Evaluation of the Fertility of Tropical Soils |
| RAMP | Rebuilding Agricultural Markets Program |
| SAADA | Strategic Alliance for Agricultural Development in Africa |
| SADC | Southern African Development Community |
| SPSS | Statistical Package for Social Science |
| SSA-CP | Sub-Saharan Africa Challenge Program |
| STAR | Strengthening Trade at the Regional Level in Agricultural Inputs in Africa |
| TFI | The Fertilizer Institute |
| ToT | Training of Trainers |
| UDP | urea deep placement |
| UEMOA | Union Economique et Monetaire Ouest Africaine (West African Economic and Monetary Union) |
| UNPCB | Union Nationale des Producteurs de Coton du Burkina Faso (National Union of Cotton Producers of Burkina Faso) |
| URCEP | Union Régionale des Commerçants Exportateurs de Pommes de Terre (Regional Union of Potato Traders and Exporters of Sikasso) |
| USAID | United States Agency for International Development |
| USDA | United States Department of Agriculture |
| VAT | value-added tax |
| WACIP | West Africa Cotton Improvement Program |
| WECARD | West and Central African Council for Agricultural Research and Development |
| WOTRO | Dutch Foundation for the Advancement of Tropical Research |

# Message from the Board Chairman and the President and Chief Executive Officer

M. Peter McPherson

Amit H. Roy

### Fertilizers: Key to Long- and Short-Term Solutions to the World Food Crisis

*The global food crisis has caught many by surprise, but the demand for food, feed, and fuel has been increasing for some time. Sub-Saharan Africa, the world's poorest region, has been hit hardest. Fertilizers are key to both long- and short-term solutions to the food crisis.*

*The rising price of food is caused by increasing demand and lack of supply to meet the demand. A growing middle class in many developing countries helps drive up prices. As incomes rise, food preferences change, especially the demand for meat and dairy products, which require more cereals and the plant nutrients to grow them. This is particularly true in China and India, whose combined populations comprise 37% of the world's population.*

*Other factors are: population growth; the rapidly increasing demand for biofuels; weather-related disasters, such as droughts and floods, perhaps caused by global climate change; and natural disasters, such as the devastating earthquake in China. A substantial failure in Australia's wheat crop and the rising costs of energy for food production and distribution worsen the situation. Speculation, as well as limitations or bans and high tariffs on grain and fertilizer exports by some governments, also factor in.*

*All of these factors—plus the fact that the world's fertilizer supply has not kept pace with fertilizer consumption—are driving fertilizer prices up. The price of urea, the most common and widely traded nitrogen fertilizer product, rose from about $277 to $405 per ton in 2007 and to about $452 per ton by April 2008 (Figure 1). The price of diammonium phosphate (DAP) rose by 200%, and potash prices rose 176%. And the end is not in sight.*

*Fertilizer prices cannot be expected to fall until a new investment cycle reaches fruition and the fertilizer supply again matches demand. Even then, if energy prices continue to hover at current levels,*

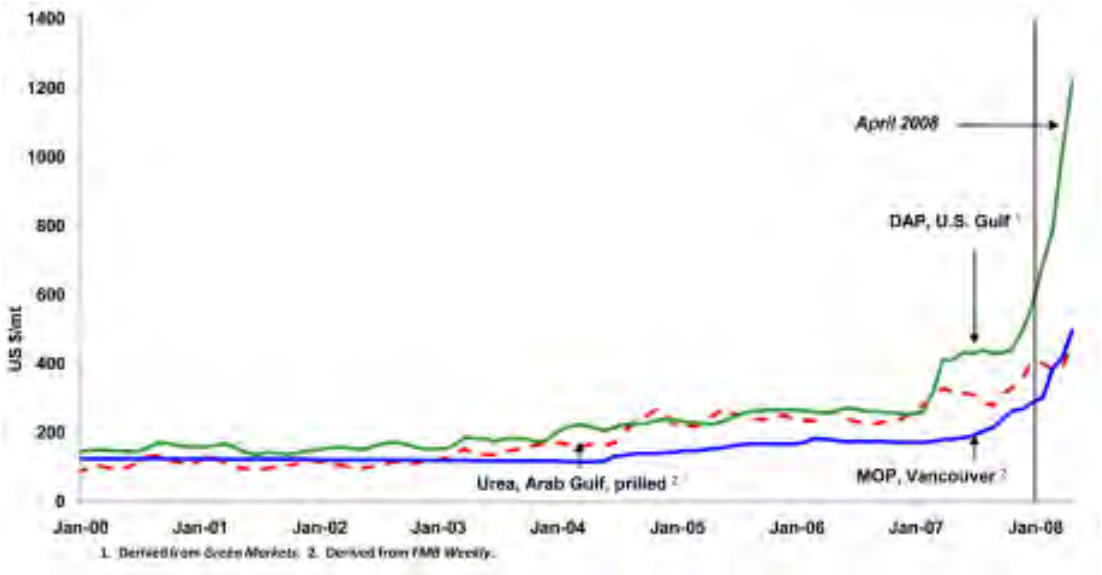


**Figure 1. Fertilizer Prices**

*nitrogen prices will remain high. Similarly, phosphate fertilizers, particularly DAP, will remain high because of the higher costs of quality phosphate rock and sulfur. Investment costs in fertilizer manufacturing plants have also escalated considerably in the past 2 years.*

### Fertilizer Problems

*Promoting long-term growth in agricultural productivity in Africa requires a focus on major staple foods: cereals such as maize, sorghum, millet, and rice, as well as cassava, yams, plantains, and bananas.*

*Soil fertility is central to crop growth. Both inorganic and organic fertilizers are an important way to maintain or increase soil fertility on agricultural lands. But resolving soil fertility issues in isolation will not achieve the productivity gains required to feed the poor in developing countries, or even in Africa where nutrient-depleted soils are the main constraint to increased productivity.*

*The surest way to increase productivity in most environments is to improve soil fertility through proper fertilizer use. But farmers must have nutrient-responsive seeds to reap the benefits of the fertilizer. No amount of fertilizer can achieve results beyond the genetic potential of a crop variety. Similarly, no variety can achieve its potential without proper nourishment.*

*This was the basis for the Green Revolution, launched by improved seeds and proper fertilization. When Dr. Norman Borlaug was awarded the 1970 Nobel Peace Prize, he stated, "If high-yielding dwarf wheat and rice varieties are the catalysts that have ignited the Green Revolution, then chemical fertilizer is the fuel that has powered its forward surge."*

*Even though fertilizers were key to the Green Revolution, they have received little attention over the past two decades.*

## More Efficient Fertilizer Products Needed

*Most fertilizer products that farmers use today were developed during the 1950s to 1970s by the fertilizer program of the Tennessee Valley Authority (TVA)[1] with U.S. Government funding.*

*Energy seemed abundant back then, but we now see its increasing scarcity and thus, higher price. We must direct far more research and development resources to the improvement of nitrogen fertilizer use efficiency.*

*Our current fertilizer products and application methods are wasteful. For example, growing plants sometimes use only 30% of the nutrients in the urea that farmers apply. This is particularly alarming because urea is not only a "modern" high-analysis fertilizer, it is also the dominant nitrogen fertilizer product, in terms of market share, that farmers use worldwide.*

*Using current manufacturing processes, the energy equivalent of about 4 barrels of oil is used to convert "free" atmospheric nitrogen to 1 ton of urea. But after leaching and atmospheric losses, the energy equivalent of about 2.5 of these 4 barrels of oil is wasted for every ton of urea applied. Furthermore, the "lost" nitrogen becomes atmospheric or water pollution.*

*Also important is the energy wasted in transporting more fertilizer product than plants actually need.*

*Phosphorus, another necessary nutrient for plant growth, is mined as phosphate rock—a non-renewable resource. Conversion of phosphate rock to soluble fertilizers such as DAP is inefficient. With current technology and rate of use, the world has only 200 years of known reserves of phosphate rock. The cost of exploiting phosphate resources will rise as we exhaust the more readily accessible deposits. Phosphates will be a far greater concern than nitrogen or potash in the next decade. Thus, research is urgently needed to improve efficiency of existing technologies for processing phosphate and for utilizing phosphate rock directly from the mines without processing.*

*We must develop "smart" fertilizers that will release nutrients only at the time and in the amount needed, and will lessen environmental pollution. That will require investments in the next generation of fertilizer products using advanced techniques in conjunction with plant genetics.*

*We must have systems to make these products cheaper and more accessible to farmers in developing countries. To be fully effective in achieving higher productivity, such fertilizers must be applied as part of a comprehensive package of high-yielding varieties (HYVs), crop protection products, and appropriate farm management techniques. Fertilizers, seeds, and other farm inputs cost money, so they are practical only when applied in the context of a viable value chain that compensates the producer for production costs and returns a reasonable profit.*

## Technologies to Increase Fertilizer Efficiency

*Traditionally, farmers across the tropics have broadcast urea directly into the rice paddy floodwater—a practice that is only about 30% effective in terms of nutrient uptake. Thus, two of every three bags of urea that a farmer applies are lost.*

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[1]The TVA fertilizer program, which employed more than 1,500 people at its peak, was discontinued in the early 1990s.

*To reduce losses and improve productivity, rice farmers across Bangladesh are adopting urea deep placement (UDP), a technology developed and disseminated by IFDC. Farmers who use UDP insert large briquettes of urea into the rice root zone. UDP increases yields by 25% while using 40% less urea. Farmers worldwide need these types of gains in efficiency and productivity.*

## Policy Issues Must be Addressed

*Besides greater investments in research, policy issues that can improve agricultural productivity and efficiency at all levels must be addressed.*

*One such policy issue is farmer access to fertilizers and seeds. Many advocate direct product subsidies on the grounds that poor farmers in developing countries cannot afford fertilizers and HYV seeds. More than 15 countries provide direct or indirect subsidies to reduce the cost of fertilizers to farmers. These subsidies increase as prices and consumption of fertilizers increase.*

*But fertilizer subsidies sometimes result in inefficient use, leading to low agricultural productivity and air and water pollution, because there is little incentive for farmers to maximize return from fertilizer use. These expenditures are at the expense of other important government investments in rural areas such as roads, schools, and health clinics.*

*Some argue for free distribution of fertilizer and seeds—but others claim that free distribution will destroy or prevent growth of the private sector.*

*Voucher programs are an option to support and strengthen commercial distribution by transferring purchasing power to subsistence farmers who can't afford to pay high prices for inputs such as fertilizer. Vouchers can be given at a discounted price or earned by targeted farmer groups, then redeemed through private sector dealers for fertilizers and seeds. Voucher programs can also make reduction of subsidies over time easier as farmers become more commercial and creditworthy and build their capital bases. Voucher programs also allow the use of subsidies as incentives for extension and farmer adoption of productivity-enhancing technologies.*

## Conclusion

*Immediate relief is obviously needed. But short-term relief should not undermine long-term solutions. The successes of the Green Revolution misled policymakers into believing that food production would keep pace with demand, so governments and most international organizations cut back on agricultural research expenditures. Meeting the current food production crisis will require a major recommitment to agricultural research by developing countries and donors. Our focus should be to increase efficiency and productivity in all farming systems, particularly in dryland and rainfed environments, and along the entire value chain to produce better food at lower cost. At the same time, we must find ways to save energy while protecting natural resources, biodiversity, and the environment.*

# Improving Market Efficiency

# Improving Input and Output Market Efficiency

*Agricultural input dealers can play a key role in linking smallholder farmers to both input and output markets. IFDC programs improve the capacity of private sector networks to supply critical agri-inputs to farmers at lower costs. Producer organizations are important in development because they directly represent farmers' interests and are often engaged on both sides of the farm gate—supply and demand—in the value chain. Farm organizations often serve as agri-input dealers. Good market information is also essential for the development of commodity and input trade. IFDC activities in market information systems improve and link efforts to generate, disseminate, and commercially use agricultural information to monitor prices, production, and trade, and to build strong and dynamic commodity chains.*

## Input Market Development

### Sub-Saharan Africa

#### AIMS: Agricultural Input Markets Strengthening Project

***Mozambique***

The AIMS project promotes private sector investment and competitive marketing of agricultural inputs to improve farmers' access to markets in Mozambique. The key activities include:

1. Business development and human capacity building.
2. Association building.
3. Technology transfer, extension support, and soil fertility restoration.
4. Increased production of improved seed varieties.
5. Improved policy environment and agri-input regulatory regime.
6. Regional collaboration.

**Unloading and bagging fertilizer at the Port of Beira, Mozambique.**

The project focuses on the "island corridors" from the ports of Beira and Nacala.

**Highlights:**

- At the request of the Minister of Agriculture, AIMS organized the design of a pilot program for promoting agri-input use during the 2008/09 cropping season. The program utilizes vouchers to assist farmers in purchasing inputs through dealers trained by the project.

- AIMS is working with the Ministry of Agriculture to facilitate policy changes needed to promote agri-input use including elimination of the fertilizer import tax, restrictions on re-export of fertilizers, and required dredging of the Port of Beira.
- A feasibility study on establishing a large regional forward stocking fertilizer warehouse near the Port of Beira was conducted. The facility would enable consolidated bulk imports of fertilizer materials for Mozambique, Malawi, Zambia, and Zimbabwe. The economy of scale would lower input costs and make them more accessible to farmers.
- An agro-dealers' trade association, Associacão Moçambicana de Provedores de Insumos Agropecuarios (AMPIA), has been formed with AIMS' assistance.
- A study tour was conducted to expose nine dealers to market and trade development in South Africa and Malawi.

International partners are the International Institute for Tropical Agriculture (IITA), the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), and the Citizens Network for Foreign Affairs (CNFA). The United States Agency for International Development (USAID) funds the 30-month AIMS project, which began in 2006.

[For more information on AIMS, see **Capacity Building**.]

## APEP: Agricultural Productivity Enhancement Program

***Uganda***

APEP is expanding economic opportunities in Uganda's agricultural sector by increasing farm productivity and improving the marketing of key food and cash crops. APEP seeks to commercialize agriculture by making farming profitable for subsistence farmers. IFDC also provides short-term technical expertise and training to agri-input dealers to improve market performance. Initial activities have focused on trading; management of small and medium enterprises; technical aspects of fertilizers, seeds, and crop protection products (CPPs); updating fertilizer recommendations for key crops such as maize, coffee, banana, and cotton; improving market transparency; and strengthening trade linkages between Kenyan agri-input importers and wholesalers and Ugandan dealers.

### Highlights:

- APEP has trained more than 310 agricultural dealers and producer organization trainers through seven training workshops across Uganda.
- More than 400 copies of an IFDC agri-input retailers' guide have been distributed.
- A monthly newsletter provides dealers with information on input prices and global trends, as well as "tips of the month."
- A prototype fertilizer recommendation system has been developed for field validation.
- A training of trainers program was conducted on the use of decision support systems for fertilizer recommendations for staff from Makerere University, national agricultural research institutes, and producer organizations.

USAID awarded the 5-year project to Chemonics International, with a subcontract to IFDC, in 2004.

## MIR: Marketing Inputs Regionally to Develop Agri-Input Markets in West Africa

***Coordinated from Burkina Faso***

**A Togolese woman selling vegetables in a Lomé market.**

MIR helped increase the affordability and accessibility of quality inputs to farmers in West Africa. The project was based in Burkina Faso with activities in Benin, Ghana, Mali, Nigeria, and Togo. The project helped develop regional and national regulatory frameworks, supported the professionalization of producer and trader associations, facilitated dialogue in agri-input markets, and helped in the sustainable development of the cotton agri-input subsector. The MIR strategy was twofold: (1) to provide technical support and training to develop capacity in agri-inputs and (2) to develop and catalyze leadership among stakeholders.

### Highlights:

- Helped develop and adopt regional regulatory frameworks on seeds and pesticides through technical support to the Economic Community of West African States (ECOWAS) and the West African Economic and Monetary Union (UEMOA).
- Facilitated the adoption of fertilizer regulatory frameworks by the Burkinabe and Nigerian governments.
- Capacity building and technical support led to the establishment of three national and two regional agri-input dealer associations, as well as a consortium of three Ghanaian associations.
- Improved linkages of agri-input dealers at both national and regional levels and facilitated their relationships with regional and international suppliers.
- Trained 74 master trainers in five countries and developed four association-building toolkits to help producer and trader organizations reach more members. MIR training sessions raised stakeholder awareness, stimulated association building, and built the professional capacity of organizations.
- Focused on bottlenecks on inputs for cotton production. Through technical support to national producer organizations and cotton companies, MIR helped develop improved fertilizer procurement systems that take advantage of the cyclical nature of fertilizer prices and develop other ways to cut costs.
- Improved cotton productivity after MIR tested new cotton fertilizer formulas to alleviate magnesium and potassium deficiencies, which are prevalent in soils throughout the West African cotton zone.
- Increased professionalization and collaboration within the cotton sector through the development of a cotton interprofessional association in Togo and organization of the West and Central African Cotton Conference by the cotton network West and Central African Council for Agricultural Research and Development (WECARD).
- Supported the production of the video *Hope for West Africa's Agri-Input Markets*, which demonstrates the importance of inputs in increasing agricultural productivity. MIR published monthly fertilizer price outlooks, quarterly newsletters, information notes, press releases, and organized public debates on input issues.

MIR helped spark the professionalization of agri-input dealers through improved input purchasing systems, better fertilizer formulations, and judicious use of CPPs in cotton production.

"To address declining cotton yields and to support privatization in West African countries, MIR developed a Cotton Emergency Plan," says Francis Dabiré, MIR Communications Manager. "Activities included the purchase, distribution, and use of inputs; fostering good farm management and farmer organizations; reviewing cotton input formulas; and bringing stakeholders together."

**Selling fertilizer in Mali.**

MIR, which began in 2003, was funded by the Dutch Directorate-General for Development Cooperation (DGIS). DGIS's initial financing ended in December 2007, but IFDC and partners are exploring the continuation of project activities at the regional level.

## AND: Agro-Dealer Network Development in Nigeria

***Coordinated from Nigeria***

AND is increasing the capacity of agro-dealers in nine Nigerian states. Co-funded by the National Programme for Food Security (NPFS), the project is also piloting a fertilizer voucher program in Bauchi and Kano States.


**Scott Wallace, IFDC Country Representative for Nigeria (center), discussing the importance of fertilizer with village leaders in northern Nigeria.**

The project began in April 2008 and is expected to train 20 master trainers over 14 months through a technical Training of Trainers (ToT) program. The master trainers will train a minimum of 900 agro-dealers (100 agro-dealers in each home state) on topics including:

- Product knowledge, safety, and handling.
- Salesmanship and marketing.
- Business skills and financial/inventory management.
- Logistics, planning, and delivery.
- Input use, crop production, and processing technologies.

The pilot fertilizer voucher program will target the NPFS farmers from three sites in the two selected states as subsidy recipients. A team of observers and voucher experts will monitor this pilot program and develop recommendations for the Government of Nigeria to scale up a targeted subsidy program for the 2009 agricultural season.

## STAR: Strengthening Trade at the Regional Level in Agricultural Inputs in Africa

***Coordinated from Muscle Shoals, Alabama, U.S.A.***

The newly initiated STAR project is to promote food security and agricultural growth through improved regional input trade and to make agri-inputs of higher quality more readily available at a lower cost to African traders and farmers. Partners include the Common Market for Eastern and Southern Africa (COMESA), the East African Community (EAC), and the Southern African Development Community (SADC). The proposed project will:

- Build capacity for agricultural input trade policy and institutional reforms.
- Expand market linkages for agricultural input traders and farmers and their associations.
- Disseminate market information to promote trade.

Methods to achieve the STAR objectives include: (1) targeted consultations with key stakeholders to assess local policy environments; (2) capacity building of regional economic communities, the private sector, and farmers' organizations; (3) establishment of a regional market information system; and (4) organization of annual policy and trade workshops to build consensus on policy agenda at the regional level and to disseminate effective strategies for implementing workshop recommendations.

Expected outcomes include:

- Establishment of an agricultural input market information and transparency system for Africa.
- Trade and market development through an enabling policy environment and strengthening of the private sector.
- Improved advocacy capacity of traders' and farmers' associations.
- Development of business linkages among agri-input importers and input manufacturers and traders.
- Reduced agri-input transaction costs.

Linking importers across Africa will generate economies of scale in fertilizer procurement for larger multicountry markets. The William & Flora Hewlett Foundation initiated the 3-year STAR project in 2007.

IFDC vouchers used in Afghanistan.

## Vouchers Turn Farmers Into Market Participants

Voucher programs can help smallholder farmers access and buy affordable fertilizer and other inputs in sufficient quantities while strengthening the role of rural agro-dealers. IFDC has used vouchers in successful technology transfer programs in Malawi, Afghanistan, Kyrgyzstan, and Nigeria and is currently helping the governments of Mozambique and Nigeria implement voucher programs.

"Vouchers are coupons that farmers use to buy agricultural inputs at subsidized prices while maintaining or strengthening the private sector," says Dr. Amit Roy, IFDC President and Chief Executive Officer.

Organizers of programs to intensify agricultural production provide vouchers to targeted farmers. The farmers then redeem vouchers for products through private agro-dealers who in turn collect payment from the program organizers or financial institutions.

Vouchers can also be used as a form of crop credit, in which farmers pay back the value of the voucher at harvest.

"Vouchers are called 'smart subsidies' because they supply inputs to selected farmers without disrupting the commercial market," Roy says. "In fact, vouchers can *build* both local markets and purchasing power for poor farmers.

"Voucher programs must be designed specifically for a particular country. One thing to look out for is fraud. We must use security measures such as watermarks, expiration dates, and serial numbers to ensure that the farmers who need vouchers most are the ones who receive them."

Scott Wallace, IFDC Country Representative for Nigeria, says, "The beauty of voucher programs is that they tackle both the immediate need of helping targeted farmers and the long-term need of building the private sector."

Ian Gregory, IFDC Agribusiness Specialist, says, "Technical assistance and training are integral to voucher programs. Agro-dealers are trained to introduce new technologies and teach their farmer customers how to correctly use inputs. This sets farmers on the road to increased productivity—the route out of the poverty trap."

IFDC implemented a pilot voucher program in Nigeria in 2004 and has initiated a follow-up program in 2008.

"The federal government of Nigeria subsidizes fertilizer by 25%," Gregory says. "IFDC is working with the government to provide an alternate delivery plan that provides improved access to the subsidized fertilizer for smallholder farmers. We're trying to show that vouchers are a means to directly target small farmers."

Wallace has helped introduce the new voucher program to rural farming communities in northern Nigeria. "A typical complaint among farmers was the limited quantity of subsidized

fertilizer made available to rural smallholders," Wallace says. "For example, one farmer told us that last year their village received only 100 bags of fertilizer through the government subsidy. Thus, farmers received only about 4 to 5 kg each, but they need at least 100 to 150 kg/ha to apply to crops. In many Nigerian states, 75% or more of the subsidized fertilizer goes to large farms or political patrons, leaving very little for smallholder farmers who need it most.

"The state governments sell subsidized fertilizer for as low as 1,000 naira [US $8.55] per bag—a price that the private sector can't compete with. Because the rural input dealer network is extremely weak, farmers who want more fertilizer must travel long distances to buy from government warehouses.

"To complement the voucher program, the Agro-Dealer Network Development (AND) project will work to train about 900 agro-dealers across 9 Nigerian states in product knowledge, input safety and handling, business management, and new input technologies." AND is co-funded by the National Programme for Food Security (NPFS) and the National Food Reserve Agency (under the Federal Ministry of Agriculture and Water Resources).

IFDC introduced vouchers in Afghanistan in 2002 to provide post-conflict emergency assistance to about 200,000 farmers, who repaid for inputs provided through the vouchers to their local villages at harvest. The villages then spent the money on infrastructure investments such as improved irrigation systems, feeder roads, and market stands. IFDC trained more than 800 fertilizer traders in input handling and use, agronomy, and marketing. IFDC expanded the voucher program in Afghanistan for the 2005/06 season, issuing about 600,000 vouchers.

In 2003, IFDC gave vouchers to 100,000 subsistence farmers in Malawi in exchange for 1 month of labor each on village feeder roads. Farmers used the vouchers for improved seeds and fertilizer for growing maize.

"The Malawi program worked well," Gregory says. "Roads were improved, giving better access to markets. Agro-dealers earned more income and reinvested in more stock for the next year."

Dr. Balu Bumb, leader of the IFDC Policy, Trade, and Markets Program, says, "More significantly, it reduced the hungry period from 4 months to 1 month in a year for participating households." (The hungry period is the time families had to rely on food aid.)

Gregory says, "Voucher programs bring farmers and dealers together. We're trying to make smallholder farmers active market participants."

Bumb says, "During this period of soaring fertilizer prices, smallholder farmers need support. The targeted voucher system provides the most viable instrument to help the poor without distorting the market, because it kills two birds with one stone: poverty alleviation and market development."

**Afghan farmers exchanging vouchers for fertilizer.**

## ASAP: The Accelerated Sustainable Agriculture Program

***Afghanistan***

An agri-input dealer selling vegetable seeds and pesticides in Jalalabad, Afghanistan.

ASAP builds on past successes of IFDC and its partners in developing market-led value chains in Afghanistan's central provinces by expanding the approach into western, northern, and northwestern Afghanistan. ASAP is also improving linkages with public sector research and extension systems to increase sales and attract investment in the private sector. IFDC provides training and technical assistance through ASAP to address crop production issues in the overall value chain and to support policy initiatives for quality agri-inputs by:

- Strengthening and expanding the agri-input dealer network across Afghanistan.
- Promoting proven crop management practices.
- Working with dealers and farmers to broaden the availability of quality agri-inputs.
- Helping the public sector develop regulatory guidelines to ensure agri-input quality.

ASAP grew out of Rebuilding Agricultural Markets Program (RAMP), which ended in 2006. USAID funds the 5-year ASAP program, which began in 2007, on contract to Chemonics International. IFDC is a subcontractor.

## KAED: The Kyrgyz Agro-Input Enterprise Development Project

***Kyrgyzstan***

In 2001, KAED began to support the development of agri-input dealerships and increase agricultural production through the use of improved technologies in the Ferghana Valley of Kyrgyzstan. KAED operations shifted in October 2006 to develop input markets in northern Kyrgyzstan and to integrate agricultural markets nationwide.

KAED's purpose is to develop previously nonexistent markets for legal fertilizer imports and build networks of dealers to improve farmer access to agri-inputs and improved crop production technologies. KAED has helped farmers increase productivity by about 50% in a difficult environment characterized by small farms and outdated Soviet systems and policies.

"Understanding free market rules after 80 years of Soviet rule was a big challenge for my generation," said Bayir Mamil, a Kyrgyz farmer. "The main goal for collective farms was only to produce. We understand how difficult it is for KAED to teach old dogs new tricks—we're learning every day."

The KAED project has developed a 140-member trade association, the Association of Agribusinessmen of Kyrgyzstan (AAK), and provides information and other support services for agri-input dealers. USAID funds the KAED project.

**Highlights:**

- In 2001, contraband imports comprised almost 90% of total fertilizer sales in southern Kyrgyzstan, and legal imports were only 729 tons. By 2006, legal fertilizer imports in all of Kyrgyzstan had grown to 55,000 tons and by 2007, to 87,000 tons, despite higher world prices. Sales of imported certified seed increased by 48% in 2007.
- The AAK customer base increased from 140,000 farmers in 2006 to 330,000 in 2007. The average incomes of AAK farmer customers increased by 48% in 2007 versus 23% for non-customers.
- KAED has established market linkages with 16 international and regional suppliers including multinationals such as Syngenta, Pioneer, Bayer, and Aventis.

**Ainagul Suleymanova (left), owner of the retail farm store "FARMER" in the Tokomak Region, northern Kyrgyzstan, discussing ways to improve fertilizer use efficiency with her customers.**

- The first farm stores were opened in Kyrgyzstan with KAED support in June 2003. The country now has 35 agribusiness stores. The functioning network of retail farm stores has increased farmers' access to quality inputs and knowledge and has reduced the distance they travel to buy agri-inputs.
- The monetary value of increased agricultural output through the use of improved agri-inputs and best farmers' practices is calculated at $80 million over KAED's 5-year implementation period.
- From October 2006 to March 2008, AAK dealers imported and sold 8,500 tons of compound fertilizer. Kyrgyz farmers had generally not used compound fertilizer before. In 2004, KAED introduced 200 tons of compound fertilizer and demonstrated its value through large-scale demonstrations sites. Since then, its demand has increased steadily, particularly by vegetable and potato farmers.
- In March 2008, KAED facilitated a business trip to Turkey for management staff of the Seed Association of Kyrgyzstan to establish links with Turkish seed companies for seed production and distribution. The association finalized pending contracts and signed additional contracts amounting to $300,000.
- KAED is helping develop the market for animal feed in Kyrgyzstan by establishing the first demonstration on cattle feeding and management in a private farm in the Sokuluk Region, near Bishkek. The demonstration will feature advanced feed rations, proper veterinary medicine, animal health, and milking equipment. KAED expects significant increases in milk production, improved quality of dairy products, and better farmer incomes.
- KAED is helping AAK lobby for the amendment of Kyrgyzstan's Land Law, which would consider land as capital for commercial producers. This would help farmers access finance at reasonable rates.

# Fourth Annual "Silk Road AgroExpo" Links International and Regional Agro-Dealers

The fourth annual "Silk Road AgroExpo" agricultural exhibition was held in Kyrgystan's Osh Province, February 27–29, 2008. Hosts were the USAID-funded Kyrgyz Agro-Input Enterprise Development (KAED) project and the Association of Agribusinessmen of Kyrgyzstan (AAK).

**Participating in the event's opening ceremony are Ahmatjan Mahamadov, Deputy Minister of Agriculture, Water Resources, and Processing Industry; Azizbek Madmarov, Ambassador of the Kyrgyz Republic in the Republic of Uzbekistan; Daniyar Ilebaev, USAID Project Management Specialist; and Bolot Burgoev, Deputy Governor of Osh.**

***Photo: AAK, Djahongir Djumabaev***

Silk Road fostered linkages between the international agricultural sector and regional agro-dealers to improve commercial relations in the Ferghana Valley of Kyrgyzstan, Uzbekistan, and Tajikistan.

"Dealers were able to buy inputs at better prices before the planting season started, which allowed them to have better margins," says Hiqmet Demiri, IFDC Agribusiness Specialist and KAED Chief of Party. "This was also beneficial to the farmers, because inputs were available on time."

Participants also learned successful business management practices. More than 200 people attended training sessions on establishing cooperatives, organizing exhibitions, and veterinary laws. Entrepreneurs established $100,000 in business contracts during the exhibition.

"Silk Road was a unique opportunity to distribute information about my store and establish new business contacts with suppliers of seeds and crop protection products," says private entrepreneur Habbibula Halikov, AAK member and owner of the farm store "Orunbai" in Osh. This was Halikov's first time to participate in the event. He sold 50,000 soms (US $1,370) of products, and about 250 farmers expressed interest in doing business with his store.

More than 2,000 people visited the exhibition, including 43 companies from Germany, Ukraine, Iran, Kazakhstan, Netherlands, Russia, India, Uzbekistan, and Kyrgyzstan. Participants included international donor organizations, financial institutions, and producers and suppliers of agri-inputs, seeds, crop protection products, and agricultural equipment.

## Agri-Input Retail Business Growing in Kyrgyzstan

Baltabaeva Raihan started her business—a retail farm store named "Raihan"—in February 2001. She first opened in the central market of Kyzylkiya, Batken Province, in remote western Kyrgyzstan with just 16,000 soms (about US $400). Raihan had limited goods because she lacked access to certified seeds, mineral fertilizers, crop production products (CPPs), and business linkages with large dealers and representatives of international suppliers.

**Azamat, Raihan's new farm store in Batken Province, Kyrgyzstan.**

Today, Raihan's store annually makes more than $22,000. Raihan's clients increased from 200–300 in 2001 to 2,000–3,000 now. Raihan's success grew after she attended the 2007 Silk Road AgroExpo, an annual agricultural exhibition hosted by the Association of Agribusinessmen of Kyrgyzstan (AAK) and the Kyrgyz Agro-Input Enterprise Development (KAED) project. Raihan improved linkages and struck business deals with local and regional companies. She was also trained in farm store development through an AAK course, supported by KAED.

Raihan, a certified crop protection specialist, joined AAK in 2005. AAK works to promote the development of legal businesses and improve partnerships among producers, suppliers, and agri-input dealers. The organization also lobbies for its members and provides access to quality inputs such as advanced fertilizer formulations, CPPs, and services and information on new production technologies.

Raihan teaches her customers the proper application and safe use of CPPs. She provides high-yielding vegetable seeds to farmers who produce for the market and suppliers of three processing facilities in Batken.

Raihan opened a second farm store called "Azamat" (which means "person of good will") on April 30, 2008, with KAED support. The new store earned about $1,400 in its first 3 weeks. Azamat provides high-yielding vegetable and maize seeds and quality CPPs supplied by reputable international companies. Raihan continues to provide advice and knowledge to her farmer clients.

AAK began conducting the annual Silk Road AgroExpo in 2004. Participants include agri-input suppliers and agro-processing companies from Kyrgyzstan, Central Asia, Russia, India, China, and Europe.

# Output Market Development

## Sub-Saharan Africa

### MARKETS: Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites
***Nigeria***

The MARKETS project has focused on increasing economic opportunities in Nigeria's agricultural sector by raising farm productivity, enhancing value-added processing, and increasing commercialization through private sector-led and market-driven growth and development. MARKETS has transformed low input/low output, subsistence farming to commercially competitive agriculture in selected areas.

**Highlights:**
- IFDC is helping improve Nigeria's agri-input supply system by working with farmers, importers, and wholesale/retail agro-dealers to increase sales of improved seeds, fertilizers, and crop protection products.
- A total of 19,000 farmers are using improved technologies for the targeted commodities in states covered by MARKETS.
- US $4.3 million was leveraged as commercial loans for MARKETS microfinance partners in the last quarter leading up to the planting season.

USAID funds the 5-year MARKETS program, which will continue through June 2010.


A Nigerian market scene.

### MISTOWA: Strengthening Regional Networks of Market Information Systems and Trader Organizations in West Africa
***Coordinated from Ghana***

The MISTOWA project increased regional agricultural trade and food security in West Africa by improving and linking efforts to generate, disseminate, and use market information commercially. MISTOWA helped regional market information systems (MIS) and trade partners address constraints to develop strong and dynamic commodity chains that use information to enhance production, handling, credit, and trade and to improve value-added services such as processing, packaging, and quality control. Effective MIS and trade and producer organizations heighten farmer awareness of opportunities and technologies to increase production, and facilitate the demand for higher value agricultural products. MISTOWA targeted products that significantly impact trade, income generation, and food security. Products included grains, cassava, livestock, onion, tomato, cashew nut, shea butter, and fertilizer.

**Highlights:**

- MISTOWA provided skills training to more than 12,400 producers, traders, and other stakeholders. Most improved their business and trade abilities through participation in trade fairs and similar events.
- Through an innovative public-private partnership, MISTOWA supported the development and use of "TradeNet" (www.tradenet.biz), a web-based market information platform owned and developed by Busylab, a Ghanaian private software company. The platform allows users to post and get real-time prices, offers to sell, and other information using the Internet or mobile phones. Targeted information is delivered to farmers' and traders' mobile phones through text messages. In 3 years, TradeNet has linked 537 markets in 13 West African countries. It has more than 640,000 prices available and serves about 5,000 registered users. More than 120,000 tons of cereals have been offered for sale since August 2007. TradeNet has developed business models and partnerships with mobile operators in Ghana, Nigeria, and Côte d'Ivoire.

**A Malian woman using her mobile phone. TradeNet allows users to receive real-time prices, offers to sell, and other information through text messages on mobile phones.**

- MISTOWA provided $1.4 million in grants to 64 producer, trader, and market information service partners from 12 West African countries for buying computers, funding Internet connectivity, and establishing more than 150 Agribusiness Information Points (ABIPs). It facilitated market access through participation in trade fair attendance and similar events that generated almost $2 million in direct sales.
- MISTOWA catalyzed more than $400 million in intraregional trade, according to 16 partner trade associations that monitored their sales and purchases.

The 4-year MISTOWA project was funded by USAID, with additional support from Agriterra, a Dutch-based farmer organization. MISTOWA ended in 2007, but IFDC received bridge funding from the William & Flora Hewlett Foundation to continue critical MISTOWA activities and to design MISTOWA-type information systems for southern and eastern Africa.


**An Agribusiness Information Point (ABIP) in Mali. MISTOWA has established more than 150 ABIPs across West Africa.**

## An Agribusiness Information Point is Officially Launched in Tchamba, Togo

**At the ribbon cutting of the official launching of the ABIP in Tchamba are, left to right, Hawa Titikpina, representing the Prefect of Tchamba; Claudia Lalumia, representing Rob Groot, Director of IFDC Africa; and Bienvenu Kombate, Executive Director of APCR.**

Agricultural producers and traders of Togo's Central Region can now easily connect to world markets through a new Agribusiness Information Point (ABIP) in the Tchamba District. The ABIP launching was on December 1, 2007, coinciding with the 10th anniversary of the Farmers' Association for Rural Communication (APCR). More than 300 participants attended the 2-day event.

APCR contributes to IFDC's mission to boost agricultural trade, ensure food security, and reduce poverty in Sub-Saharan Africa.

"ABIPs use TradeNet, an electronic platform that provides access to real-time market information—prices, offers to buy and sell, business contacts, and relevant news—on more than 300 agricultural products from 500 markets throughout West Africa," says Claudia Lalumia, representing Rob Groot, Director of IFDC Africa. "TradeNet helps farmers and traders communicate thus facilitating trade via mobile phone or Internet."

One hundred and fifty ABIPs have been established in conjunction with the MISTOWA project.

"We commend IFDC for making this information tool available precisely as the European Union is renewing its cooperation with our country," said Hawa Titikpina, President of the Organization for the Development of Women in Islam. "By connecting our traders to the rest of the world and allowing them to find market opportunities, the ABIP will help reduce poverty.

"I particularly welcome the new ABIP in Tchamba because women will be the first beneficiaries. Women are very active traders in the region. Men usually farm while their wives sell the produce."

Bienvenu Kombate, APCR's Executive Director, says, "The ABIP will bring great change in the milieu by helping farmers sell more products at the best market prices and improve their incomes."

Daouda Adamu says, "We need information not only on markets but also on the production aspects, particularly soil fertility and fertilizers." Adamu is a member of ALAFIA, a microfinance consortium of Beninese and Togolese NGOs. "We hope that the ABIP will bring us market information and support to help us succeed."

# IFDC Board's Africa Committee Responds to the Food Crisis

**The Africa Committee of the IFDC Board observed the CATALIST project during a field trip in Rwanda.**

"Africa's soils are tired. IFDC is helping small-scale farmers restore soil fertility, thus feeding the soil that feeds them," said Professor Ruth Oniang'o, Chairperson of the Africa Committee of IFDC's Board of Directors, at its annual meeting held June 9–10, 2008, in Kigali, Rwanda.

Much of the meeting was spent discussing how IFDC can use its core competencies and experience to address root causes of chronic food insecurity in Sub-Saharan Africa.

"IFDC was established in 1974 as a response to the food crisis that hit developing countries at a time when oil prices had skyrocketed," Dr. Amit Roy, IFDC CEO, said. "Today, spiraling food and fuel costs are again putting pressure on governments and donors to find ways to increase agricultural productivity. Special attention must be directed to the fertilizer sector, which was a key component of the Asian Green Revolution."

Abdelmajid Slama, Vice Chairman of the IFDC Board, said, "The challenge of today's food crisis fits well with IFDC's core competencies. IFDC is the only center with the expertise and facilities for research on fertilizer development and nutrient use efficiency."

Board members emphasized that while short-term efforts to resolve the current food crisis are urgently needed, this implementation must not compromise the development of long-term solutions.

### Implementation of the Abuja Declaration

The Committee stressed the need to accelerate implementation of the *Abuja Declaration on Fertilizer for an African Green Revolution*, which governments of more than 40 African nations wrote at the Africa Fertilizer Summit held in June 2006 in Abuja, Nigeria. The Abuja Declaration declared fertilizers a "strategic commodity without borders"—meaning that all cross-border taxes and tariffs should be lifted. The Declaration called for a program to make fertilizers more available and affordable for small-scale farmers. In response, the African Development Bank recently established the African Fertilizer Financing Mechanism Special Fund to support regional fertilizer procurement and distribution, provide credit for fertilizer imports, and develop local fertilizer manufacture in Africa.

### Visit to CATALIST Project

The meeting included a field trip to observe CATALIST,[1] a 5-year project to reinforce peace and stability through agricultural intensification and regional trade in Rwanda, Burundi, eastern Democratic Republic of Congo, southern Uganda, and western Tanzania. CATALIST is funded by the Netherlands Government and implemented in partnership with Helpage, an NGO that creates employment in rural environments.

"The CATALIST project is one of the best examples of how IFDC can efficiently mobilize local resources for agricultural development," Slama said.

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[1]Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability in Central Africa's Great Lakes Region.

"CATALIST helps intensify and diversify cropping systems to take advantage of local and regional market opportunities. For example, Rwanda imports most of its wheat. New wheat varieties introduced near the flour mill in the Gicumbi District have the potential to produce 200 tons per week—a golden market opportunity for farmers."

The CATALIST approach combines two IFDC technologies: Integrated Soil Fertility Management (ISFM) and the Competitive Agricultural Systems and Enterprises (CASE) approach. "ISFM combines organic and inorganic fertilizers and other soil conservation practices to increase yields while protecting the natural resource base," said Laurence Mukamana, CATALIST/IFDC Agronomist. "CASE links farm groups to input and output markets and develops linkages among key actors in the value chain."

CATALIST encourages rotational cropping and focuses on potato, wheat, and maize, Rwanda's most profitable crops. During the first cropping season of 2007, CATALIST worked with farm groups of 50 to 60 producers each in 8 of Rwanda's 30 districts. At least 30% were women.

"Before, I broadcast seeds in my field and let nature do the rest," farmer François Ruzindana told the Board. "Three months later, I harvested whatever possible. But now I organize my production more efficiently.

"It's more work, I must admit, but the outcome is worth it. And I'm proud to contribute, in my own way, to the government's Vision 2020 program to make Rwanda self-sufficient in food."

Innocent Ntabana, CATALIST's National Coordinator, said, "Potato yields have quadrupled and wheat yields tripled in some areas since CATALIST's initiation. The project supplies inputs that producers repay at 50%. The other 50% covers farmers' risks and is an incentive to open their fields for demonstrations. The project trains agro-dealers and supports the establishment of input sales outlets near the farm groups."

Florida Nyirandinda, a woman potato farmer who farms a 1-acre (0.4 ha) plot, said "I could barely harvest 1,000 kg with the old practices. But last season, I was amazed to harvest 2,600 kg using new methods that CATALIST introduced. Paying for my children's school is no longer a problem. I can even afford some extras. Plus, I didn't go empty handed when I recently visited my daughter and her new child!"

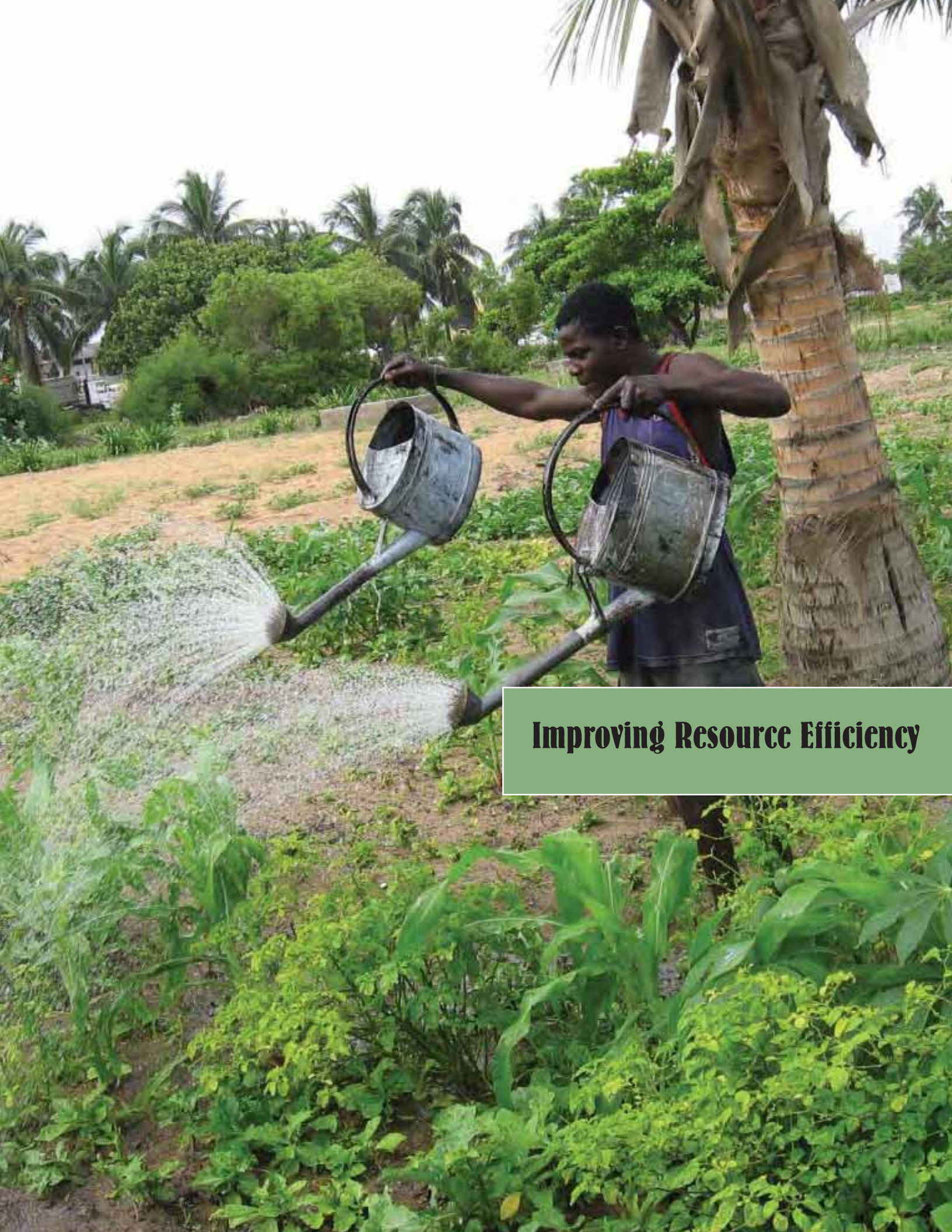
The Africa Committee also stressed the need for long-term investments in research to increase nutrient use efficiency.

"Most of the present suite of fertilizer products was designed in an era of apparent energy abundance," Roy said. "Current fertilizer products and application methods are often wasteful. Two of every three bags of urea—the dominant nitrogen fertilizer product used by farmers worldwide—are lost to the environment by leaching or volatilization. The nutrients end up in the air or in the water. We must use advanced techniques to develop a new generation of fertilizer products that release nutrients only at the time and in the amount needed to decrease losses."

Urea deep placement (UDP), the insertion of urea briquettes into the plant's root zone, allows rice farmers in Bangladesh to increase yields by 25% while using 40% less urea, Roy said. The Committee recommended that IFDC explore use of UDP with rice and other crops in Africa.

Frits van der Wal of the Netherlands Directorate-General for Development Cooperation attended the meeting as an observer and said, "Expansion of IFDC activities in Central and East Africa falls in line with the Netherlands' international development strategy. I'm impressed with the people driving the project and farmers applying IFDC's new approaches."

IFDC Board members attending the meeting besides Oniang'o, Slama, and Roy were Gerard J. Doornbos, President, Water Authority of Rinjland, Netherlands; and Dr. John Hardman, President and CEO, The Carter Center. Unable to attend was Soumaïla Cissé, President, West African Economic and Monetary Union.



# Improving Resource Efficiency

# Improving Resource Efficiency

*Current fertilizer products and application methods are often wasteful in farm production costs and cause environmental pollution. Farmers also waste inputs, water, and labor when they invest in crops with low genetic potential. IFDC conducts research to increase the efficiency of fertilizer use and to develop plant nutrient technologies that improve soil fertility while protecting the environment.*

## Africa Productivity Initiative

*Fertilizers are essential to revitalize the nutrient-hungry soils of Sub-Saharan Africa. That's why IFDC has made increasing the productivity of African soils a key initiative in its new strategy. The Comprehensive Africa Agriculture Development Program (CAADP) calls for a 6% growth rate in the agricultural sectors of African countries. But current yields of grains and other food crops are only about 30% of the world average. This is largely because African farmers use only 10% as much fertilizer as the world average. The Green Revolution countries of Asia and Latin America met increased food needs by increasing productivity. Africa's meager food increases have been mostly through reducing fallow periods and bringing more land into production. Negative environmental impacts include severe soil depletion, reduced biodiversity, and invasion of non-subsistence slash-and-burn farming. That is why IFDC joined with the African Union (AU) and the New Partnership for Africa's Development (NEPAD) to implement the Africa Fertilizer Summit, held in Abuja, Nigeria, in June 2006. The Abuja Declaration on Fertilizer for an African Green Revolution that emerged from the Summit identified fertilizer as a strategic commodity for Africa's development and called on the world to help initiate an African Green Revolution.*

**A Togolese woman takes care of her vegetable garden on the seashore outside of Lomé.**

## Nitrogen Efficiency Initiative

*The production of fertilizer, particularly nitrogen, is extremely energy intensive. For example, it takes about 4 barrels equivalent*

**Nitrogen volatilization trials at IFDC Headquarters. IFDC, in partnership with the fertilizer industry, is evaluating modified nitrogen products.**

*of crude oil energy to produce 1 ton of urea. But the efficiency of nitrogen use in developing countries averages only about 33%; the rest is lost to air and water. As energy prices soar, there is a drive toward improving efficiency of applied fertilizers. Our new strategy calls for research on managing fertilizers in a way that maximizes their use in crop growth and greater emphasis on new, more efficient products.*

*Several controlled-release nitrogen fertilizers are on the market. The development of some was based on IFDC research. But most of these products are for high-value crops, lawns, and gardens. Through the Nitrogen Efficiency Initiative, IFDC plans to develop new fertilizer products with at least 45% increased efficiency for food crops, thus reducing production costs, nitrogen waste, and pollution.*

## Impact of Urea Deep Placement (UDP) in Bangladesh

***Bangladesh***

Most rice farmers broadcast urea nitrogen fertilizer directly into the rice floodwater. Two of every three bags of urea are lost to the air or become pollutants of groundwater. IFDC research showed that the efficiency of fertilizer use can be greatly improved through urea deep placement (UDP).

Results from IFDC's UDP project in Bangladesh illustrate the success of IFDC's agribusiness approach. IFDC introduced UDP technology in Bangladesh in the late 1980s. By 2006, 550,000 farmers had adopted UDP. The average number of persons per household whose annual rice requirements of 224 kg/person were fully met increased from 6 to 9 persons. Farmers who used UDP reduced urea use by an average of 100 kg/ha and increased paddy yields by 1 ton/ha. The net return to farmers using UDP versus broadcasting averages $188/ha. A survey of 542 UDP users showed that the greatest benefits are rice surpluses (16%), payment of children's school fees (13%), and home improvement (12%). Similar results are expected in Cambodia, Vietnam, Nepal, Nigeria, Mali, Togo, Malawi, and Afghanistan, where IFDC has also introduced UDP. Discussions are ongoing with entrepreneurs in Nigeria who may manufacture briquette machines.

**A Bangladeshi farmer inserts urea briquettes into the rice root zone.**

**IFDC and the Bangladesh Department of Agricultural Extension have organized a UDP media campaign. Showing farmers and the media the benefit of UDP is Ishrat Jahan, IFDC Resident Representative to Bangladesh.**

The Government of Bangladesh and IFDC are expanding UDP technology to 1.6 million farm families on about 1 million ha in the 2008 boro or dry season. Production is expected to increase by 548,000 tons. The new UDP program will include the manufacture and establishment of about 300 briquette machines to manufacture 2.7-gram briquettes.

By February 15, 2008, 94 new urea briquette machines had started producing urea briquettes, bringing the total to about 600 machines. Forty-five new machines have been bought by entrepreneurs, including some farmers. IFDC has trained 900 persons in the manufacture of urea briquettes.

More than 100,000 ha of new land have been brought under UDP in the 80 subdistricts where IFDC is working. Yields are increasing by about 1.4 tons/ha. Urea use in the project areas has decreased by more than 15,000 tons, thus reducing the budgetary subsidy of the Bangladesh Government by $7.5 million. Urea imports have dropped by $5 million. The expected increase in rice production is estimated at 100,000 tons. The Bangladesh Government is expected to save $50 million in foreign exchange for the non-import of rice.

## Expanding Fertilizer Management Strategies in Northern Nigeria

***Nigeria***

IFDC is assisting in the expansion of sound fertilizer management strategies among 207 communities in Nigeria's semiarid northern region. The project is sponsored by the Community-Based Agriculture and Rural Development Program, which is funded by the International Fund for Agricultural Development (IFAD). Nitrogen and phosphorus have been identified as the major limiting nutrients for cereal production through nutrient omission trials, implemented by selected farmer communities. This led IFDC to recommend the use of diammonium phosphate (DAP) and urea instead of NPK (15-15-15) in the program intervention area. Dry-spell mitigation techniques, including contour ridging and pitting, were recommended to increase cereal production.

Expected results include:

- Adoption of microdosing of DAP and calcium ammonium nitrate (CAN)/pitting by about 1.6 million farm families.
- 800,000 metric ton increase in millet and sorghum production.
- US $386 million increase in annual income of farm families.
- $240 increase in per farm income.
- $60,000,000 saving in fertilizer costs by using DAP and urea instead of previous NPK recommendations.

## International Workshop on Crop Simulation Models Helps Farmers Improve Decision Making


"Farmers need to know how to best manage what little fertilizer they can afford to optimize crop yields," says Dr. Jean Sogbedji, System Modeler and Soil Scientist for the IFDC Africa Division. "Decision support tools [DSTs] can help bridge the gap between yields on farms and on research stations."

IFDC held an international training workshop on Applications of Decision Support Tools for Fertilizer Recommendations from July 24 to August 3, 2007, in Sogakope, Ghana. The 14 participants included senior researchers and technicians from Benin, Burkina Faso, Ghana, Nigeria, and Togo.

"Rainfed agriculture has high production risks that often result in low agricultural productivity," says Dr. Upendra Singh, IFDC Senior Scientist—Systems Modeling (Soil Fertility). "Effective nutrient management requires dynamic and site-specific DSTs that capture the various factors involved, including input supplying capacities, management practices, and production objectives. A DST gives users quick and reliable answers regarding the types of varieties to grow, planting dates, timing and rate of fertilizer applications, and crop rotation alternatives."

The workshop focused on the combined use of geographic information systems (GIS) and crop modeling tools such as the Decision Support System for Agrotechnology Transfer (DSSAT).

"DSSAT is a software package that integrates the dynamics and interactions among soils, crops, weather, and management options," Sogbedji says. "Computer-based simulations are more cost and time effective than experiments, which can take years of effort and investment. The simulations help farmers determine yield targets for specific sites."

Louis Darko, Senior Manager of SAMBUS Company Limited and an Authorized GIS Instructor for West Africa, says, "GIS software integrates data relating to the geographic location of a place and its attributes. It helps promote efficient fertilizer use to boost food security and

improve economies." SAMBUS is an official distributor of a range of software products developed by the Environmental System Research Institute (ESRI) in California. ESRI donated a software package worth $1,500 to each workshop participant.

Yazidhi Bamutaze of Makerere University in Uganda says, "Linking DSSAT and GIS is particularly interesting. With GIS, one can visualize data and obtain maps. This is a good value addition.

"The principle is the same for all DSTs. The difference is in the outputs that you get. For instance, if you input data in the GIS component, the results will come out in the form of combined layouts or maps."

Pare Tahibou of the computer cartography section of the National Office for Soil Research (BUNASOLS) in Burkina Faso says, "We're developing a database on soils and agricultural potentials for each climatic zone at the national level. DSTs will help us create agricultural potential maps that will serve as reference documents for decision makers."

Dr. Zacharie Sedga, of the Institute for Environment and Agricultural Research (INERA) in Burkina Faso, works in Bagre near the Togo border. "This region has the greatest potential for irrigated rice in Burkina Faso," Sedga says. "If properly developed with irrigation, its 30,000 hectares could meet half of our rice needs."

Youl Sansan, who works with IFDC on a natural resource management project in Ouagadougou, says, "When I go back to Burkina Faso, I can use DSSAT to compare simulated yield targets with farmers' actual yields and make recommendations to get closer to the production potential of different regions."

Dr. Attanda Mouinou Igue of the National Institute of Agricultural Research of Benin (INRAB) says, "DSTs are extremely important not only for farmers and researchers but also for national policymakers. Governments need to have soil fertility maps to make sound decisions, based on data that reflect the realities of our soils.

"This new initiative is a decisive step toward precision agriculture."

## Phosphate Efficiency Initiative

*Phosphate reserves are dwindling and conversion of phosphate rock to water-soluble phosphorus fertilizers is inefficient. Thus, it is essential to improve the efficiency of crop uptake of phosphorus directly from phosphate rock. Through the Phosphate Efficiency Initiative, we plan to make directly applied phosphate rock as effective as the more expensive water-soluble fertilizers.*

**Collecting phosphate rock samples in Angola.**

### Phosphate Rock Decision Support System (PRDSS)

***Coordinated from Muscle Shoals, Alabama, U.S.A.***

PRDSS predicts the feasibility of phosphate rock for direct application to crops. IFDC is working with the International Atomic Energy Agency (IAEA) to standardize the characterization of phosphate rock and soil samples collected in PRDSS validation field trials in Burkina Faso, Tanzania, Malaysia, Vietnam, Brazil, and Argentina. The study was completed in 2007, and data will be used to further the development of PRDSS, including the capability to predict the residual effect of phosphate rock application. A Web site (http://www-iswam.iaea.org/dapr/srv/en/resources) has been developed in partnership with IAEA.

[For more information on IFDC phosphate work, see **Capacity Building.**]

## Soil

*Soil is the main resource available to farmers. As crops grow they remove nutrients that, if not replaced, reduce the soil's productive capacity. The air around us is 80% nitrogen. Most tropical soils "fix" enough atmospheric nitrogen to produce 1 or 1.5 tons of cereals per hectare. To produce more food than that, nitrogen must be added. Thus fertilizers, both mineral and organic, are essential for sustainable food production.*

*Integrated Soil Fertility Management (ISFM) is an entry point into the agricultural value chain. ISFM was designed to address the multiple properties of soil that simultaneously bear on plant growth. The elimina-*

**Farmers participaing in ISFM field days in Gourma Province, Burkina Faso.**

*tion of the most limiting constraint to plants is effective only to the point where the next most limiting constraint stifles growth. ISFM is holistic, ameliorating multiple constraints simultaneously. ISFM involves the integrated use of inorganic fertilizers and soil amendments such as organic matter, lime, and phosphate rock. Such soil amendments interact with mineral fertilizers to improve the quality of soils, including their organic matter, tilth, water-retention capacity, pH, and available phosphorus.*

## CSD-ISFM: Combating Soil Fertility Decline to Implement Smallholder Agricultural Intensification in Sub-Saharan Africa

***Coordinated from Togo***

CSD-ISFM promotes a holistic natural resources management approach to agricultural intensification. The project is improving equitable access to productive natural resources and technology by implementing farmer-led research on agricultural intensification, using soil, water, and crop management technologies that save labor and enhance agricultural productivity. CSD-ISFM is implementing a menu of technical options that combine soil and water conservation, soil amendments, agroforestry, and mineral fertilization for a range of production systems across agroecological zones.

Project research and activities are based on decision support tools and ISFM. Project activities are being implemented in Benin, Burkina Faso, Ghana, and Nigeria.

### Highlights:

- ISFM options were developed for rice cropping in Nigeria and maize-beans cropping in Togo.
- CSD-ISFM has organized farmer field days to evaluate ISFM-based activities. Some field days were broadcast on national television and local radio or reported in national magazines.
- CSD-ISFM's research includes:
  - Effect of organic matter on irrigated rice production in Burkina Faso.
  - Determination of the optimum economic potassium rate of application for maize monoculture and maize-cassava mixture systems in southern Togo.
  - Calibration of the Quantitative Evaluation of the Fertility of Tropical Soils (QUEFTS) model for cassava fertilization in northern Ghana and southern Togo, and calibration and testing of the Precision Nitrogen Management (PNM) model in southern Togo.
  - Synchronization of rice nitrogen need and timing and rate of fertilizer application using the Leaf Color Chart (LCC) approach and modeling approaches.
  - Trials to support modeling work aiming at definition optimum crop calendars for sustainable production intensification and diversification under irrigation in Burkina Faso.
  - Investigation of ISFM and weed interference under rice cropping and the effects of long-term tillage and ISFM practices on maize performance and soil quality in Ghana and Burkina Faso.
  - Multi-location trials on cassava nutrition in Benin, Ghana, and Togo.

CSD-ISFM provides technical backstopping to IFAD projects in Sub-Saharan Africa. IFDC is executing the project in cooperation with the Tropical Soil Biology and Fertility Program of the International Center for Tropical Agriculture (CIAT). The project is being implemented through the Agricultural Intensification in Sub-Saharan Africa (AISSA) network and is funded by IFAD.

## Energy

*Farming requires energy for labor, equipment, and transportation. Much of the cost of nitrogen fertilizer is for the energy to produce it. Better products and more efficient farming systems are needed to conserve energy and increase financial returns to investments in energy.*

**Wheat being harvested in Morocco.**

## Water

*Agriculture accounts for about 70% of all the earth's water use. Continuously renewed fresh water is a finite natural resource. The greatest potential increases in yields are in rainfed areas. IFDC is researching water management methods to improve the productivity and efficiency of water use. For example, IFDC used results from greenhouse tests to initiate field trials of drip irrigation for vegetable production in Afghanistan.*

### Improving Efficiency of Water and Plant Nutrient Materials

***Coordinated from Muscle Shoals, Alabama, U.S.A.***

IFDC scientists are conducting research on greenhouse tomatoes using drip irrigation in conjunction with different fertilization schemes, which include fertigation (the injection of fertilizer through drip irrigation) and fertilizer deep placement. The research is to maximize profitable yields and maintain optimum soil moisture levels while minimizing the amount of water used to grow a crop.

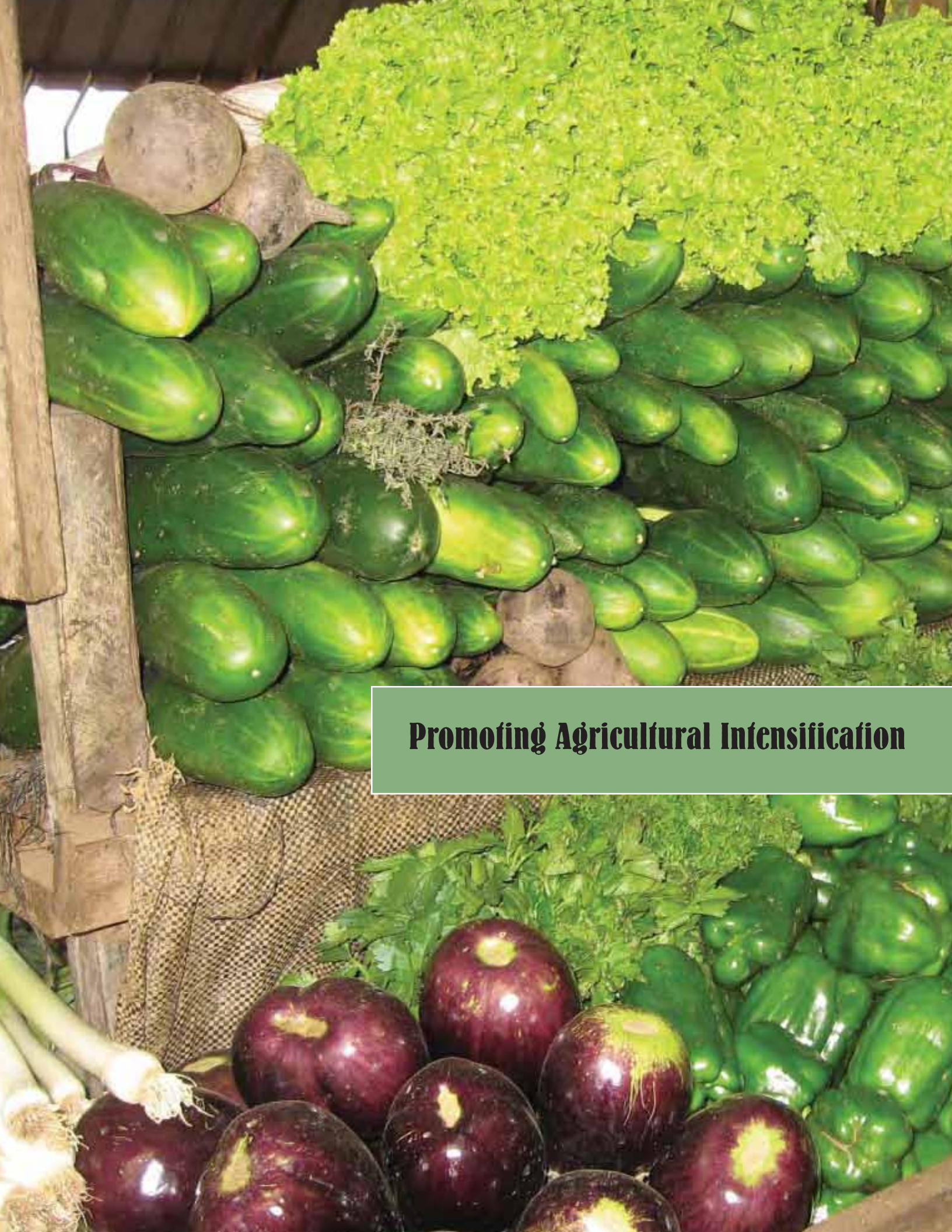
**Tomato greenhouse experiments at IFDC Headquarters.**

## IFDC Launches New Communication Initiative:
### *Focus on Fertilizers and Food Security*

IFDC has launched a new feature on the IFDC Web site: *IFDC Focus on Fertilizers and Food Security*. A link is at the bottom of the home page (www.ifdc.org).

IFDC Focus will identify fertilizer issues, especially as they relate to the rapidly changing world food situation, including: trends in fertilizer prices and production, announcements of new plants, availability of fertilizer raw materials, and the influence of energy issues on fertilizer availability. Related items such as improved methods of fertilizer use, need for research on fertilizer efficiency and the development of new products, infrastructure improvements, and agricultural policies will also be addressed.

Focus will also include analyses of the implications and possible impacts of such issues on world fertilizer production and use and food availability.



# Promoting Agricultural Intensification

# Promoting Agricultural Intensification

*Farmers in developing countries must intensify farm productivity, increasing both yields and profits, to meet the food needs of their growing populations. This includes the planting of high-yielding varieties, increased use of fertilizer and other inputs, and improved farm management.*

## Agricultural Intensification/Farm Enterprises

### Sub-Saharan Africa

#### CATALIST: Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability in the Great Lakes Region of Central Africa

***Coordinated from Rwanda***

Rwandan woman selling cabbage in a village market.

IFDC's CATALIST project is catalyzing sustainable and more intensive agricultural production in the Great Lakes Region of Central Africa. The project promotes, facilitates, catalyzes, and builds human capacity for environmentally friendly farming. CATALIST also supports the improvement of farm-to-market linkages through the rehabilitation of key roads, expanding market opportunities for agricultural products, and promoting effective agricultural policies at national and regional levels. The project is working to help 225,000 farmers adopt improved production systems and increase yields by 60%. Targeted countries are Rwanda, Burundi, and the Congo (DRC). CATALIST will soon expand to support market development and regional economic cooperation in Uganda and Tanzania.

**Highlights:**

- During its first year, CATALIST tested external input packages with 900 farmers.
- CATALIST has established strong working relationships with numerous farmers' organizations and cooperatives and with key public and private sector officials in the host countries.
- CATALIST has helped form 18 farm groups to carry out participatory research using packages of external inputs and ISFM components and established 1,067 test plots.
- CATALIST has analyzed the region's soil fertility and conducted feasibility studies for future road rehabilitation.

The Netherlands Embassy in Rwanda and DGIS began funding CATALIST in 2006. Subcontractors include a national NGO, Helpage, and other organizations.

[For more information on CATALIST, see **Resource Conservation** and **Capacity Building**.]

## Establishment of the Cocoa Abrabopa Association in Ghana

***Coordinated from Ghana***

**Staff of the Cocoa Abrabopa Association in Ghana.**

The new 3-year project will help cocoa farmers in Ghana triple production and manage their farms more efficiently. The project will provide technical assistance and training in business skills, association building, and input use. IFDC's role is to train farmers in soil fertility management, update fertilizer recommendations, and provide overall management of the project.

IFDC will work with TechnoServe, Wienco, and the Cocoa Research Institute of Ghana to make the Cocoa Abrabopa Association sustainable and effective. (Cocoa Abrabopa means "cocoa for a better life.") The Netherlands Embassy in Ghana funds the project, which began in 2008.

## MIM: Maize Intensification in Mozambique

***Mozambique***

The Maize Intensification in Mozambique (MIM) project was initiated during 2008 to help Mozambican smallholder farmers to intensify maize production through increased fertilizer use and to strengthen the entire value chain of maize production and, therefore, Mozambique's agricultural economy. This can be accomplished through linking farmers with agri-input suppliers and traders. The initial implementation period is 1 year with IFDC as the lead institution. Other implementing partners include the International Maize and Wheat Improvement Center (CIMMYT), marketing companies, NGOs, and farmer and producer organizations. The International Fertilizer Industry Association (IFA), the International Plant Nutrition Institute (IPNI), and the International Potash Institute (IPI) are providing financial resources and in-kind technical support. The first field activities will begin during the 2008/09 maize cropping season.

## WACIP: West Africa Cotton Improvement Program

***Coordinated from Mali***

The C-4 (cotton four) countries of Benin, Burkina Faso, Chad, and Mali are among the world's poorest. IFDC's WACIP project will help increase cotton productivity and farmer income by developing niche processing and marketing opportunities for cotton products and by improving the quality of cotton lint.

**Cotton farmer association in Kenedougou Province, Burkina Faso. Transport time to small farms is a big problem during the rainy season. Trucks from cotton companies cannot go to the small fields, so producers use motorbikes, bicycles, and donkey carts.**

### Highlights:

- WACIP has supported organic cotton certification through a grant to the National Union of Cotton Producers of Burkina Faso (UNPCB) to purchase cotton sacks for harvesting.
- WACIP has exposed 400 farmers to experimental demonstration plots for cotton in Burkina Faso.
- WACIP cosponsored the 160-person "Expert Consultation on Biotechnology Applications in Cotton," in partnership with the International Cotton Advisory Committee (ICAC) in October 2007 in Ouagadougou, Burkina Faso.
- WACIP sponsored the participation of 30 researchers and farm leaders in a conference organized by the African Cotton Association in August 2007 to develop a regional action plan to address the problem of low cotton yields.
- WACIP conducted a 3-day workshop for C-4 cotton breeders and cotton company representatives in Bamako, Mali, in November 2007. The group compiled an inventory of the varieties used in the C-4 zone and developed a plan for conserving varietal purity and for using research to improve lint quality.

IFDC is implementing WACIP with Abt Associates, Aid to Artisans, and three U.S. universities: Auburn, Michigan State, and Tuskegee. USAID is funding the 3-year project, which began in 2006.

[For more information on WACIP, see **Capacity Building**.]

## Improvement of Competitiveness of the Cotton Sector in Benin

***Benin***

The 3-year project focuses on using ISFM and Integrated Pest Management (IPM) to improve productivity and sustainability of cotton production systems on degraded soils in Banikoara and Dassa-Zoumé, Benin. The project also helps farmers diversify cotton production systems to allow for healthy crop rotation, efficient integration of animal husbandry in cotton-based production systems, and improved incomes.

**Highlights:**

- The project helped farmers in Benin double on-farm yields in 2007.
- Cotton producer organizations are implementing learning-action programs and have negotiated fair prices for inputs for ISFM/IPM.
- Market access is being improved for cotton and other agricultural products.
- The project is introducing the gender approach in the cotton systems of Banikoara.
- Rural radio communication is being used to provide technical information for cotton production.

The project is funded by the Dutch Embassy in Benin.

[For more information on Improvement of Competitiveness of the Cotton Sector in Benin, see **Capacity Building**.]

## 1000s+: From Thousands to Millions, West Africa

***Coordinated from Mali***

The goal of the 1000s+ project is to help 1 million farming families (10 million people) in West Africa increase agricultural productivity and profit from market opportunities. The project is also helping agribusiness enterprises engage in input distribution, processing, storage, and marketing of agricultural products. 1000s+ is linking farmers to markets by scaling-up the successful Competitive Agricultural Systems and Enterprises (CASE) approach, based on agribusiness cluster formation, commodity chain development, and strengthening of public and private institutions' ability to enable trade and agribusiness.

**Woman inspecting onions in a cooperative storage bin.**

**Highlights:**

- IFDC is currently working with 250,000 farmers through 1000s+. These farmers have increased fertilizer use to 50–100 kg/ha, compared to 9 kg/ha elsewhere in Africa.
- Agricultural productivity for targeted commodities has doubled and family incomes have increased by 30%–50% through the project introducing ISFM technologies and helping link farmer groups, local agricultural enterprises, and business support serves to input and output markets. Targeted commodities include maize, rice, sorghum, millet, cassava, yam, cowpea, groundnut, onion/shallot, tomato, potato, sesame, soybean, oil palm, pineapple, cashew nut, mango, and tiger nut.
- 1000s+ has helped 1,000 local entrepreneurs, including producer cooperatives, double their sales in the last 2 years.
- 1000s+ has helped producer organizations leverage FCFA 400 million ($950,000) in credit to procure inputs.

1000s+ is funded by DGIS.

[For more information on 1000s+, see **Capacity Building**.]

## 1000s+ and Partners Build Potato Cluster in Sikasso, Mali

**Potato production accounts for 80% of the economy in parts of Mali.**

Potato producers in the Sikasso region of southwestern Mali are proud of their bountiful harvest. "This was a good year!" says Yaya Traore, President of the Regional Union of Potato Traders and Exporters of Sikasso (URCEP).

"Producing more is one part of the challenge. But selling at the right time and best price lets producers really take advantage of their increased production," says Brehima Dagnoko, Program Manager of the Group for Research and Training in Arboriculture and Agriculture (GREFA).

GREFA is a partner in the IFDC project From Thousands to Millions, or 1000s+, which helps Sikasso producers grow more potatoes and sell them for better prices. 1000s+ uses the Competitive Agricultural Systems and Enterprises (CASE) approach, which helps farmers access input and output markets.

"Potato production accounts for 80% of the region's economy," Dagnoko says. "We're developing a competitive value chain from production to marketing."

*The production side*. "The lack of potato-specific fertilizers is a crucial issue," Dagnoko says. "Farmers often fertilize their crops with whatever falls into their hands. They even use fertilizers that are blended specifically for cotton, which may contain micronutrients that harm potatoes.

"Three years ago, Yara, a global fertilizer company, introduced potato-specific formulas, but farmers were reluctant to use them," Dagnoko says. "We set up demonstration plots and used participatory extension programs to promote adoption of these fertilizers through PRODEPAM.[1] As a result, local farmers used 2,000 tons of potato fertilizers during the last cropping season.

"We promote the use of appropriate fertilizers and quality seeds by facilitating linkages between producers and input suppliers," Dagnoko says. "But access to credit is the most limiting factor."

Banks require guarantees before granting loans for agricultural activities that are considered high risk. "GREFA's assistance guarantees that farmers will use optimal technologies. That helps ensure that they will pay back bank loans," Dagnoko says. "Another guarantee is the joint surety the group provides."

[1]Programme de Développement de la Production Agricole au Mali.

Siaka Koulibaly, URCEP Executive Secretary, says, "URCEP members now grow Claustar, a 4-month potato variety that has many advantages. Claustar yields well and doesn't lose weight during storage. That's exactly what we need: a variety that can wait for better times. At harvest in March, potatoes may sell for about CFA 250 [$0.53] per kilo; in August, prices can reach CFA 400 [$0.84]."

*The marketing side.* "Each cooperative targets a particular market using its own network. We're helping expand and consolidate these markets," Dagnoko says.

"Consolidating the markets means organizing the collection and destination markets. We have helped set up a formal structure with a person in charge of each aspect of the potato value chain. This helps us structure demand, then adjust supply to meet demand."

Djibril Sanogo, secretary to one of the six grassroots cooperatives affiliated with URCEP, is a specialist in the markets of Ouagadougou, the capital of Burkina Faso. "I collect information on regional markets that serve as a basis for setting prices," he says.

Sanogo shows how the potato market is expanding: "Togo used to import all its potatoes from the Netherlands. Last year, we organized a visit for Mrs. Sampè, a Togolese wholesaler who controls the importation of potatoes in Togo, to go to Mali and judge the quality of our potatoes. She took 80 tons for a test. If it's conclusive, she plans to buy half of her potato supply from Mali. We also sold 62 tons in Ghana, through the help of the Ghana Agricultural Producers and Traders Organization, supported by the MISTOWA[2] project."

Dagnoko adds, "GREFA also helps spread post-harvest technologies that focus on market specifications to meet required standards, and on effective packaging to limit losses.

"Road harassment, or having to pay bribes, is a more complicated problem," he says. "A load from Sikasso to Ouagadougou in Burkina Faso would be 42 km and take 2 days. Our interventions have brought the delay down to 4 hours.

"Road harassment is also costly. From Sikasso to Zegoua in the Côte d'Ivoire, a trader may have to pay about CFA 35 [$0.74]/kg in bribes. We work to make traders professionals who are well informed on market regulations set forth by the UEMOA[3] and ECOWAS.[4]"

GREFA sometimes mediates among market players. "Some traders were recently negotiating with clients in Ouagadougou for a price of CFA 300 [$0.63]/kg," Dagnoko recalls. "When they brought their products to the market they realized that the clients were selling at CFA 450 [$0.95]/kg before their very eyes. The clients were making a profit of CFA 150 [$0.32]/kg while they themselves earned only CFA 25 [$0.05]. Our traders were upset and asked us to intervene. We made both parties aware of the requirements and advantages of fair economic partnerships. The sale was eventually concluded at CFA 325 [$0.68]/kg and our traders earned CFA 50 [$0.10]/kg instead of CFA 25."

Sanogo says, "The missing link in the value chain is an agribusiness information point for potato, like the cereal point that MISTOWA helped install in Sikasso. That would let us use the Internet to search for markets."

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[2]Strengthening Regional Networks of Market Information Systems and Trader Organizations in West Africa.
[3]West African Economic and Monetary Union.
[4]Economic Community of West African States.

## F&SAD: Fertilizers and Sustainable Agricultural Development
***Mali***

The F&SAD project aims to improve access to and efficient use of agricultural inputs, particularly fertilizers, in West Africa. F&SAD also develops policy recommendations and strategies for ensuring adequate agri-input supply and financing mechanisms and helps producer and dealer associations establish demonstration plots.

"F&SAD facilitates innovation from the grassroots, originating from smallholder farmers, local entrepreneurs, bankers, and extension agents," says Dr. Arno Maatman, Chief of Party of IFDC's Strategic Alliance for Agricultural Development in Africa (SAADA). "The project is inspiring many local actors and national stakeholders to demonstrate the benefits of improved transparency, stronger coordination, and more professionalism in agribusiness."

### Highlights:

- In 2007, F&SAD trained producer organizations, input dealers, and their associations in the knowledge and efficient use of agri-inputs in Benin, Burkina Faso, Ghana, Mali, Nigeria, and Togo.
- After the training, marketing agents from the Association of Professional Producers (AOPP), the Agricultural Input Traders' Network of Mali (ORIAM), and CropLife Mali organized workshops for their member organizations. As a result, 51 subcontracts were established between producers and agri-input dealers, involving 2,000 tons of NPK and 1,000 tons of urea.

**Teaching correct weight control in Burkina Faso.**

"This shows how F&SAD helps organizations collaborate to improve planning and market intelligence," Maatman says.

The project is funded by IFA and USAID and coordinated by IFDC's 1000s+ project based in Mali.

## Innovation Aiming at Improved Rural Livelihoods in the West African Savannah Zone
***Coordinated from the Northern Guinea Savannah of Nigeria***

IFDC is working to increase agricultural productivity, reduce poverty, and contribute to the sustainable use and conservation of natural resources in West Africa's Savannah Zone. The project addresses policy and institutional measures that are needed to enable resource-poor farmers and marginalized groups, such as women, to access technologies, information, and markets, and contribute to a transparent and efficient agriculture market. The project is working to develop models for implementing Integrated Agriculture Research for Development (IAR4D) and innovative interventions to improve crop and livestock systems based on IAR4D principles.

**Highlights:**

- The project contributed to a methods development workshop conducted by the Forum for Agricultural Research in Africa (FARA) for the Sub-Saharan Africa Challenge Program (SSA-CP).
- The project participated in the Agricultural Science, Technology, and Innovation System (ASTI) workshop in Lagos, Nigeria.

FARA funds the project, which began in 2007. The project is part of the larger SSA-CP program that is also implemented in Niger, Zambia, Mozambique, Uganda, and Rwanda.

## Eurasia/Central Asia

### FARMS: Food for Agricultural Revitalization and Market Systems

***Afghanistan***

The FARMS project is helping increase production of key food and oilseed crops and working to convert agricultural products into higher value food products in Afghanistan. Funds to implement the project are from a monetization of 5,150 mt of soybean oil in Afghanistan and 10,000 mt of soybean in Pakistan.

**IFDC and MAIL staff measuring the flow rate in a drip irrigation system at Qargha Research Station in Kabul, Afghanistan.**

**Highlights:**

- FARMS introduced improved technology packages for wheat production at six research stations and 250 on-farm sites for the 2007/08 winter wheat crop. Results from 2006/07 show that yields increased by 30% for some varieties when combined with appropriate rates of NPK fertilizers.
- FARMS is training researchers and extension agents from the Ministry of Agriculture, Irrigation, and Livestock (MAIL) in improved crop production techniques.
- The project plans to train flour millers in market development and to help organize them into an association.

IFDC is implementing FARMS in collaboration with MAIL and Joint Development Associates International. The project receives Commodity Credit Corporation (CCC) funding from the U.S. Department of Agriculture (USDA) Food for Progress Program.

[For more information on FARMS, see **Resource Conservation**.]

## Resource Conservation

*Current fertilizer products and application methods are often wasteful, both in farm production costs and environmental pollution. Furthermore, farmers waste inputs, water, and labor when they invest in crops with inadequate genetic potential. Fortunately, yields can be increased and resources reduced with improved inputs or their more efficient use.*

**Fertilizer deep placement trials conducted at IFDC Headquarters greenhouses by (left to right) Dr. Upendra Singh, Senior Scientist—Systems Modeling (Soil Fertility); Ronald Smith, Senior Technician—Greenhouse Services; and Vaughn Henry, Senior Technician—Greenhouse Services.**

## Sub-Saharan Africa

### CATALIST: Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability in the Great Lakes Region of Central Africa

The soils of Central Africa's Great Lakes Region are highly acidic and nutrient deficient.

**Highlights:**

- Through the CATALIST project, IFDC is helping farmers better manage 170,000 ha of farmland.
- Farmers are being trained in ISFM.
- CATALIST is developing fertilizer recommendations to restore the region's soil fertility.

[For more information on CATALIST, see **Agricultural Intensification** and **Capacity Building**.]

**CATALIST is helping Rwandan farmers manage their farmland better.**

### Technical Backstopping for International Fund for Agricultural Development and African Development Bank Investment Projects in Burkina Faso

***Burkina Faso***

IFDC is promoting ISFM and agribusiness development to intensify agriculture in Burkina Faso, with a special focus on inland valley development. Simulation modeling tools are used to analyze the environment and identify options for improved and sustainable natural resource management.

**Highlights:**

- In 2007 the project organized 14 farmer forums for 950 farmers (20% were women). The forums dealt with indigenous nutrient supply and nutrient deficiency symptoms.
- The project conducted participatory and action research on nutrient management under maize and cotton systems and legumes for four learning groups.
- The project identified limiting nutrients for maize and cotton and developed fertilizer recommendations for five learning groups.

The Government of Burkina Faso funded the project, which ended in 2007.

## PDRSO: Project for the Development of the Rural Southwest of Burkina Faso

***Burkina Faso***

The overall objective of PDRSO is to reduce rural poverty. IFDC is working to improve soil fertility and facilitate agribusiness cluster formation and commodity chain development.

**Highlights:**

- Six farmers' forums were organized from September to October 2007. About 450 farmers participated in the visits; 80 were women. The visits dealt with Participatory Learning and Action Research, tools and approaches for estimating indigenous nutrient supply, and describing nutrient deficiency symptoms.
- Participatory trials were completed on nutrient management for maize and cotton systems and for legumes with four learning groups.

The Government of Burkina Faso funded PDRSO as component of an IFAD loan project until 2005. The project has been jointly funded since 2006 by IFAD and SAADA/1000s+.

## Technical Backstopping of African Development Bank Investment Projects in Benin

***Benin***

IFDC is helping the Government of Benin to facilitate sustainable agricultural intensification, with a special focus on ISFM in inland valley, roots and tuber, and maize/legumes farming systems.

**Highlights:**

- The project developed a guideline for the elaboration of IFSM plans in the pilot villages.
- Helping implement project activities are six research development professionals trained in decision support tools applied to ISFM.
- The project has trained 100 farmers through Participatory Learning and Action Research.
- The project identified two pilot inland valleys for crop diversification and support to women farmers' activities in vegetable production.

### Interactive Effects of Land Management and Soil Macro-Faunal Biodiversity on Physical and Hydrological Soil Properties Determining Nitrogen and Water Use Efficiency in West and East African Agroecosystems

***Coordinated from Burkina Faso, Kenya, and Ghana***

The project's objective is to determine how land management and macro-faunal biodiversity in the soil affect soil properties.

**Highlights:**

- Trials were conducted in Burkina Faso and Kenya to monitor the effect of soil management on runoff, soil moisture, water evaporation, and crop performance.
- Twelve treatments were implemented in Saria, Burkina Faso, and nine in Nyabeda, Kenya. These treatments include three main components: rotation, tillage, and residue management. Each component will be compared to a natural fallow.
- The long-term effect of organic input and soil tillage on soil and water balance under semiarid conditions was established.

The project is funded by the Dutch Foundation for the Advancement of Tropical Research (WOTRO), which resides under the Netherlands Organization for Scientific Research.

## Eurasia/Central Asia

### FARMS: Food for Agricultural Revitalization and Market Systems

**Highlights:**

- FARMS installed technologies for cauliflower, cabbage, and broccoli production at Qargha (Kabul) and Sheshambach (Nangarhar) Research Stations in Afghanistan. The technologies incorporate deep placement of fertilizers and micro-irrigation to increase the efficiencies of NPK fertilizers and water. Initial data suggest increased nutrient use and water use efficiencies of 25% and 40%, respectively.
- IFDC will be combining nutrient management results from site-specific demonstrations and trials to develop nationwide recommendations that will increase land productivity and reduce risks to farmers.

**Hand weeding in drip irrigated area at the Qargha Research Station in Kabul, Afghanistan. Note the weed-free area where the peppers are grown on black plastic mulch.**

[For more information on FARMS, see **Agricultural Intensification**.]

# Capacity Building

# Capacity Building: Training, Demonstration, Extension

*Training is integral to all IFDC work. Training develops the technical and organizational capacity of our partners in the field.*


IFDC training booth on UDP in Bangladesh.

Four training kits have been developed to build professionalism among dealer associations by training their members in business and technical skills. IFDC drew on worldwide experience to develop the kits and will publish them in English and French in 2008.

- A *Starter Kit for Agribusiness Associations*. This practical guidebook helps executives and management staff during every step of the life of an agribusiness association.
- A *Facilitators' Kit on Management of Agribusiness Associations*. This training manual guides facilitators in institutional development and organizational strengthening of agribusiness associations.
- A *Training-of-Trainers Toolkit for Facilitators*. This set of training manual, PowerPoint files, handouts, and a CD-ROM provides technical information on the safe use of agri-inputs to guide facilitators through a 5-day Training-of-Trainers Course.
- A *Training-of-Trainers Follow-Up Toolkit for Facilitators*. This toolkit guides facilitators through a 5-day follow-up program for graduates of the Training-of-Trainers Course.

A *Facilitator Kit for PLAR (Participatory Learning and Action Research)* was also developed. PLAR helps teach farmers basic principles involved in innovative technology. It helps to develop farmers' capacity to respond to evolving conditions and changes in the agroecological and socioeconomic environment. A core value of PLAR is the empowerment of stakeholders—their ownership of the process of change for autonomous decision making.

## AIMS: Agricultural Input Markets Strengthening Project

AIMS has trained 44 trainers, including wholesale agri-input dealers, in the proper use of agri-inputs. The "core" trainers, in turn, are participating in training programs to train 200 more. The training focused on:

- Bookkeeping and accounting.
- Financial management and demand forecasting.
- Business planning and credit control.
- Customer care and communication.
- Retail shop management.
- Small-scale food processing technologies.
- Post-harvest technologies at market/dealer level.
- Safe use of CPPs.
- Plant nutrition.
- Integrated management of soil fertility, recognizing single vs. compound fertilizers, and calculation of fertilizer nutrient content.
- Seed varieties, management and storage of seeds, quality control, and sales and marketing of seeds.

**A maize demonstration plot established through the AIMS project.**

AIMS conducted a study tour to expose nine dealers to market and trade development in South Africa and Malawi. Collaborating with the Agricultural Research Institute of Mozambique (IIAM), the project established 17 field demonstrations jointly with agri-input dealers to train them on the use of demonstration plots in promoting the use of inputs and decision support systems. Dealers were also trained to use portable soil test kits to estimate nutrient needs and PDAs (handheld computers) programmed with a Nutrient Management Support System (NuMaSS) to calculate fertilizer requirements for specific locations.

[For more information on AIMS, see **Input Market Development**.]

## CSD-ISFM: Combating Soil Fertility Decline to Implement Smallholder Agricultural Intensification in Sub-Saharan Africa

### Highlights:

- CSD-ISFM has implemented more than 30 training programs for 2,500 farmers, extension agents, technicians, and researchers on topics such as decision support tools for fertilizer recommendations and ISFM-based PLAR. The PLAR approach integrates farmer participatory research and agricultural extension activities. Researchers, extension workers, and farmers develop options together to meet farmers' needs.
- Training on PLAR was conducted in Benin, Burkina Faso, and Nigeria with the participation of 130 facilitators and extension agents from IFDC collaborative institutions.
- An international training workshop on applications of decision support tools for fertilizer recommendations was held with the participation of 20 scientists including service providers and partners from Togo, Burkina Faso, Ghana, Benin, and Nigeria.
- In Burkina Faso, 50 technicians and extension agents were trained on ISFM-based PLAR principles.

[For more information on CSD-ISFM, see **Soil**.]

## CATALIST: Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability in the Great Lakes Region of Central Africa

"Training of trainers" is the main approach for capacity building through CATALIST.

### Highlights:

- Project staff and 10 potential trainers participated in CASE training in Kenya and Mali.
- Sixty staff members from regional NGOs, agricultural ministries, and research organizations have been trained in ISFM, the CASE approach, and calculating fertilizer profitability.

[For more information on CATALIST, see **Agricultural Intensification** and **Resource Conservation**.]

## WACIP: West Africa Cotton Improvement Program

### Highlights:

- WACIP teams identified cotton artisans in the C-4 countries and developed a training program to help these predominantly female groups understand and respond to intra-regional and international market demand.
- In December 2007, WACIP team member Aid to Artisans trained 20 textile artisans from Burkina Faso and Mali in business skills and product development.

[For more information on WACIP, see **Agricultural Intensification**.]

## Improvement of Competitiveness of the Cotton Sector in Benin

The project's objectives are to strengthen the capacities of village-level producer groups and increase sustainability of cotton production and natural resource management.

A cotton field in Benin.

### Highlights:

- A total of 8,000 farmers have been trained through 80 learning plots and farmer-to-farmer extension.
- The project is introducing the gender approach in the cotton systems of Banikoara.
- Rural radio communication is being used to provide technical information for cotton production.

[For more information on Improvement of Competitiveness of the Cotton Sector in Benin, see **Agricultural Intensification**.]

## 1000s+: From Thousands to Millions

1000s+ provides training for women's associations across West Africa.

### Highlights:

- 1000s+ has given hands-on training to 150 business support services to strengthen core competencies in cluster formation and value chain development activities.
- The project has established farmer-led steering committees to design and monitor agribusiness cluster action plans and value chain development activities. Financial and technical support and training are being provided to producer organizations, business support services, and other stakeholder and partner organizations to implement the action plans. So far, more than 60 cluster plans have been implemented.
- 1000s+ has assessed the training needs of women associations and entrepreneurs in West Africa. The project has trained business support services on gender sensitivity approaches through 17 workshops involving 500 women and 70 men.

[For more information on 1000s+, see **Agricultural Intensification**.]

## ISFM Fosters "Soil Doctors" Through Farmer-to-Farmer Training in Togo

"I consider myself a soil doctor," says Atchou Théophile, President of the Gbenodou Union, a union of farmer groups in Afagnan, Togo. (Gbenodou means "mutual understanding.") "The soils have had little secrets for us since we've become involved in participatory learning on Integrated Soil Fertility Management [ISFM] with IFDC. Now, we want to share this knowledge with other farmers so that they can question their soils and find the right combinations of medicine to heal them."

**Ms. Adjoa Akouavi presents a module synthesizing crop performance indicators and the results of farmers' observations.**

IFDC-trained farmers are training other farmers in the Maritime Region of Togo. This marks a turning point in farmer empowerment, a process initiated through the ISFM approach developed by the Natural Resource Management (NRM) program of IFDC-Africa and partners with funding from the International Fund for Agricultural Development (IFAD).

ISFM improves soil fertility by optimizing synergies from the combined use of mineral fertilizers and locally available organic amendments (crop residues, compost, and green manure). This contributes to IFDC's mission to sustainably increase agricultural productivity and profitability in Africa.

The strategy involves developing carefully selected communities into ISFM "knowledge centers" that will extend successful ideas and practices through methods such as farmer-to-farmer training.

"The farmer-to-farmer facilitation encourages farmers to conduct their own field studies and share knowledge and experiences," says Francis Tamelokpo, IFDC Agronomist. "Farmer-led training fosters farmer empowerment. IFDC facilitates the learning process and provides assistance and support from a distance."

For the 2007 cropping season, the NRM program assessed farmers' capacities as trainers and signed a training contract with the Gbenodou Union.

"The outcome was an outstanding success and we will replicate the experience with other farmer group unions in the 2008 cropping season," Tamelokpo says.

Members of the Gbenodou Union benefited from the participatory learning and research-action process introduced in the Djakakopé village in 2003–2004. Producers validated the results in 2005–2006 in the villages of Djakakopé and Djonokouvé with the support of IFDC and partners.

"To encourage widespread farmer adoption of ISFM practices, we implement a 'technology plus' approach that integrates human capacity building with technology and institutional development," says Dr. Jean Sogbedji, Coordinator of the IFAD project. "Farmers' involvement in research and extension is crucial to ensure that the ISFM options are technically feasible, socially acceptable, and economically sustainable."

**Thirty farmers received participation certificates and 24 prizes were awarded to the trainers and farmers who successfully applied ISFM options on their own.**

Seven trainers from the Gbenodou Union trained 30 farmers on 12 plots (0.4 ha each) that the owners offered for participatory learning. Through hands-on practices, farmers learned to diagnose the soil nutrient status and determine the types and dosages of nutrients needed to optimize yields, based on results of simulation models developed by IFDC for the maize-cassava system in southern Togo.

Outcomes of the farmer-to-farmer training were showcased in a workshop organized by the Gbenodou Union in Attikplè, Togo, in December 2007. The workshop provided a platform for about 300 farmers representing 9 farmer group unions[1] as well as producers, researchers, fertilizer dealers, government agents, NGOs, private enterprises, and the media to discuss problems and explore solutions.

The trainees' spokespersons presented a series of modules on three basic components: the site knowledge, the concept and installation of diagnosis plots, and protocol for evaluation of ISFM options.

"We've learned to put on paper the description of the village, the types of soils and cultures, and the cropping calendar," says Ms. Sossi Tata, a trainee. "This helps us better plan our activities over the entire cropping season."

Ms. Sodohouin Ketika, another trainee, adds, "Before, we knew only two fertilizers: urea and NPK, 15-15-15. Now, with the diagnosis plots, we can question our soils to know precisely which elements of N, P, or K they need most to produce more."

The evaluation and comparison of ISFM options showed that N and K were the most limiting factors in the village's soils. Use of NK fertilizer produced 3.6 tons/ha of maize and NPK, 3.8 tons/ha. The use of PK produced only 2 and NP, 2.3 tons/ha. This means that investment in only P in the village would provide little return.

Farmers were also trained to use "resource flow mapping" to analyze nutrient flows and improve resource use efficiency. Farmers compared the financial returns per hectare for three ISFM options on maize-cassava farms: (1) the no fertilizers-no mucuna option yielded FCFA 190,000 (US $462); (2) mucuna-no fertilizers, FCFA 230,900 ($562); and (3) fertilizers and mucuna, FCFA 637,900 ($1,551).

"The outcomes of this workshop show that farmers are ready and capable of holding the reins of their development affairs," Sogbedji says. "The demand for farmer-to-farmer trainings is strong. Five farmer group unions have submitted site-specific training proposals, which the NRM program is considering for the 2008 cropping season."

[1] A union represents 10–30 villages.

## Business Development Services Fund—Micro, Small, and Medium Enterprises Project

***Nigeria***

The project delivered business development and advisory services in Kaduna State, Nigeria, to selected micro, small, and medium enterprises (MSME) to reduce constraints and bottlenecks in the agricultural sector.

### Highlights:

- A series of workshops was held in Kaduna State for 26 MSMEs on agro-processing, business investments, and hygiene.
- Each MSME site was visited to monitor improvements and needs for additional support.
- A training curriculum and business plan toolkit for MSMEs is being drafted. Topics include sales and marketing, hygiene, quality control, stock management and inventory, access to credit, production, and association building.

The Government of Nigeria funded the project, which ended in January 2008.

**Woman selling produce in a Nigerian market.**

## Knowledge Management for Natural Resource Use and Environmental Protection

***Coordinated from Benin and Togo***

The research project aims to identify constraints and opportunities for effective knowledge management (KM) strategies in Benin and Togo. The project analyzed how the socioeconomic and political contexts in the countries influence KM and identified key actors involved in KM and tools used to share the knowledge among actors. A particular emphasis was put on problems related to the access to and use of knowledge.

### Highlights:

- The project developed a research methodology for case studies in Benin and Togo.
- Documentation on the research theme and field work in Benin and Togo were completed.

The project is in collaboration with the Royal Tropical Institute (KIT) of the Netherlands.

### PADL/CLK: Local Development Support Project for the Provinces of Comoé, Léraba, and Kénédougou

***Burkina Faso***

The overall objective of PADL/CLK was to reduce rural poverty in the Burkina Faso provinces of Comoé, Léraba, and Kénédougou. IFDC helped improve soil fertility and facilitate agribusiness cluster formation and commodity chain development.

**Highlights:**

- Farmers' forums were organized in September and October 2007. Five hundred farmers participated in the visits; 100 were women.
- The project implemented nutrient omission trials in cotton and maize systems.

The Government of Burkina Faso funded the project as a component of an African Development Bank loan. The project ended in April 2008.

## Other Training in Africa

- Training on modeling and geographic information systems (GIS) for decision making was held in Sogakope, Ghana, in July–August 2007. Teams of the graduates will apply decision support services to refine fertilizer recommendations in Ghana, Burkina Faso, Togo, Nigeria, and Benin.

- An Agri-Input Marketing and Dealer Development training program was held in Pretoria in July–August 2007 in coordination with three South African agri-input trade associations. IFDC sponsored some of the 34 participants from 13 countries, mostly in Africa.

- IFDC has partnered in training with CropLife, Africa-Middle East since 2004. The focus has been on training-of-trainers, with dealers and importers of agrichemicals trained to become master trainers. Participants are from national CropLife associations, the public sector, and other technical partners. The 5-day course comprises a 3-day program on competencies that trainers need and 2 days on preparation and presentation of sessions on the safe use of CPPs. Participants who pass all tests join a pool of master trainers. One training program was held in Ghana in 2007. Training programs will be held in Madagascar, Mali, Burkina Faso, and Nigeria in 2008.

- IFDC's training modules on Participatory Learning and Action Research for Integrated Soil Fertility Management (PLAR-ISFM) in Sub-Saharan Africa were updated. Training on PLAR-ISFM was conducted for IFAD-investment-project agriculture service providers (facilitators and extension agents) in Benin (22 participants including 4 from Togo), Burkina Faso (40 participants), and Nigeria (50 participants). More than 30 learning groups of 15–20 each including women are actively involved in action research and participatory learning in West Africa.

- IFDC organized the International Workshop on Phosphate Fertilizer Production Technology June 18–22, 2007, to train engineers in the phosphate fertilizer industry on behalf of IFA. It was the fourth in the biannual series of such programs that began in 2001. The training program was held in Brussels, with 35 participants from 23 worldwide companies. Representatives of 15 different organizations gave presentations. Participants visited two Belgian fertilizer plants.

## South America

### Assessing Crop Production, Nutrient Management, Climate Risk, and Environment Sustainability with Simulation Models

***Argentina***

IFDC scientists Dr. Paul Wilkens and Dr. Upendra Singh served as instructors at a workshop on the Decision Support System for Agrotechnology Transfer Version 4 (DSSAT) held November 10–21, 2007, in Pergamino, Argentina. DSSAT is computer software that uses simulation models to help farmers best manage their crops. Workshop participants were from Argentina, Uruguay, and Brazil. The workshop was conducted by the National Institute of Agricultural Technology, Argentina; University of Georgia, U.S.A.; and IFDC.

**Participants in the DSSAT workshop in Pergamino, Argentina.**

## Eurasia/Central Asia

### BSAIDD: Batken and Sughd Agri-Input Dairy Development Project

***Kyrgyzstan and Tajikistan***

BSAIDD worked to improve the productivity and profitability of agricultural sectors, particularly cheese and dairy farmers, in the Batken District of Kyrgyzstan and Sughd District of Tajikistan.

**Highlights:**

- BSAIDD helped livestock farmers increase quality dairy production and linked them to animal feed, veterinary supplies, and other agri-inputs.
- BSAIDD helped establish the Agribusiness Association of Tajikistan (AAT), in which 85 trained agri-input dealers serve a customer base of 50,000 farmers. The project also helped establish a private veterinary group.
- BSAIDD trained 800 farmers and 180 veterinarians in topics such as feed seed varieties, hoof cutting, and artificial insemination of livestock. As a result of the hands-on training and technical assistance, dairy farmers were able to increase milk production from 5 liters/day to 8 liters/day.

**An agricultural fair organized by AAT in Sughd Province, Tajikistan.**

IFDC implemented BSAIDD as a subcontractor for the USAID-funded AgFin+ project. BSAIDD ended in September 2007.

## Asia

### Impact of Urea Deep Placement (UDP) in Bangladesh

More than 900 producers have been trained in the manufacture of urea briquettes. IFDC and the Bangladesh Department of Agricultural Extension (DAE) have organized a UDP media campaign that includes leaflets, posters, caps, stickers, radio programs, television commercials and talk shows, and billboards. Under the new phase of the UDP program, IFDC has conducted 80 training programs for 2,800 DAE extension agents and 800 programs for 32,000 farmers.

**Explaining UDP to Bangladeshi farmers is Ishrat Jahan, IFDC Resident Representative to Bangladesh.**

# AFADA Helps Transform Albania's Agriculture

**Bajram Cenaj (center) owns a seed and fertilizer retail store in Tirana, Albania.**

***Photo by Tritan Cako***

The Albanian Fertilizer and Agribusiness Dealer Association (AFADA) was founded in 1993 to help restructure Albania's agricultural sector after the collapse of the communist government and to improve the business lives of Albanian farmers. The project was originally implemented by IFDC and funded by USAID.

"AFADA's success, not only in Albania but in the entire Balkan Region, was a stimulus for the creation of an umbrella association, the Association and Business Management Center [ABMC]," says Tritan Cako, Executive Director for AFADA and ABMC. Both organizations share the same building and work together in a complementary way under Cako's management.

The members of the association are committed to market development, technology transfer, and provision of quality products to their farmer clients. Accomplishments include privatization of the fertilizer, seed, and crop protection product (CPP) markets; reduction of import tax for agriculture inputs from 15% to 5%; and sales of 82,000 tons of fertilizers in 2007, despite the high world fertilizer prices. Since 1993, the association has provided to its members more than $85 million in loans with a 98% repayment rate.

The association offers fertilizers, CPPs, quality seeds, animal feed, samplings, greenhouse supply materials, construction materials for agriculture, spray pumps, and flour mill equipment. Exporting products have become joint ventures for many members. AFADA's turnover in 2007 was $22 million.

A credit union was established by AFADA in 2000. Association members may put their savings in the credit union and also have quick access to loans (up to $50,000) at lower interest rates than the banks offer. To date, the AFADA credit union portfolio for loans is $450,000.

AFADA members are now affiliated with many large international companies including Pioneer, Syngenta, DuPont, Bayer, Ciba-Geigy, and Monsanto. Many AFADA dealers are distributors and country representatives for these companies' products.

"AFADA's success has stimulated the development of other agriculture industry associations, not only in Albania but also in other Eastern European countries, and in many developing countries," Cako says.

Services provided by AFADA and ABMC are:

- Connections with a database of more then 150 AFADA entrepreneurs throughout Albania.
- Secretarial, communication facilities, interpreters, and specialists.
- A full-time procurement office.
- Banking liaison assistance.
- Business planning support.
- Market assessment assistance.
- Liaison with the Ministry of Agriculture and Food concerning licensing of products.
- Information on Albanian tax codes.
- Information on port and customs clearance.
- Assistance in preparing advertisements and radio/TV promotions.
- A monthly newsletter, "Agri-Business," which provides information, achievements, studies, and research articles for the agriculture sector and advertisements for the businesses of members.
- Supervision of demonstration plots using company products including computer simulation models (wheat and maize) based on soil and meteorological data and farm management studies that guide members through the economy of Albanian farmers.
- Participation in regional meetings for dealers.
- Participation in local and international events including fairs and shows, conferences, and seminars.

# IFDC Trains Afghan Agronomists in Statistical Design for Agricultural Experiments

IFDC conducted a training course for 14 Afghan agronomists in "Statistical Design and Analysis for Agricultural Experiments," August 21–September 1, 2007, at the Agriculture Ministry in Kabul.

**Dr. Joaquin Sanabria (far right) lectures in English as Abdul Jalal (far left) translates into Dari.**

Nine of the trainees were from the Ministry of Agriculture, Irrigation, and Livestock (MAIL), four were IFDC-Afghanistan staff, and one was with the International Maize and Wheat Improvement Center (CIMMYT).

"This was the first time any of the trainees were exposed to this type of statistical material," says the instructor, Dr. Joaquin Sanabria, IFDC Scientist–Biometrician.

**IFDC-Afghanistan staff member Hassamuddin Hashimi, by the fan, and four other participants.**

The instruction covered theoretical principles and applications of the most common experimental designs used in agriculture (completely randomized, complete block randomized, factorials, and split plot), analysis of variance, multiple comparisons of means, and regression analysis. Practices to minimize experimental error and increase precision were emphasized for all phases of the experiments: planning, conducting, data collection, and analysis.

"We conducted concept and practical exercises using data from 2006/07 IFDC wheat research trials in six Afghanistan provinces," Sanabria says. "Participants were trained to use SPSS [Statistical Package for Social Science] software for the data analysis from field and greenhouse experiments."

The lectures were simultaneously translated into Pashto and Dari by Abdul Jalal and Homayoun Watan, IFDC-Afghanistan staff.

# Training in Soil Testing for Afghan Agricultural Researchers

IFDC trained 26 Afghan agricultural researchers in "Soil Sampling, Testing, and Interpretation Related to Soil Fertility and Plant Nutrition Management," October 31–November 6, 2007, at the Ministry of Agriculture, Irrigation, and Livestock (MAIL) in Kabul, Afghanistan.

The training was conducted by IFDC's Food for Agricultural Revitalization and Market Systems (FARMS) project. Trainees were from MAIL; Nangarhar University; the Alternative Livelihoods Project in Eastern Afghanistan, funded by the U.S. Agency for International Development (USAID); and IFDC-Afghanistan.

**Homayoun Watan (right) with the IFDC FARMS project overseeing the collection of soil samples.**

Organizing and conducting the course were Dr. Steven Kovach, Program Leader, IFDC Soil and Nutrient Dynamics Program; and Dr. Thomas W. Crawford, Jr., former Director, IFDC Research and Market Development Division.

"The training course was structured to improve the participants' understanding of key issues in soil science," Kovach says. "The training included field exercises, classroom lectures, and both classroom and field laboratory exercises. The course also established or improved communication and linkages among participants."

Crawford says, "The hands-on training in soil and irrigation water testing expanded the participants' awareness of the chemical and physical properties of soils and how they relate to agronomic management. The participants previously had only textbook knowledge of these areas—but had never actually used instruments for testing."

Topics covered included:

- An overview of plant nutrition:
  - The 17 essential plant nutrients.
  - Roles of essential plant nutrients and deficiency symptoms.
  - The *law of the minimum*, which states that, "The most growth-limiting nutrient will limit plant growth, regardless of the adequacy of supply of the other nutrients" (Singer and Munns in *Soils: An Introduction*).
- Introduction to soils:
  - Physical properties of soils.
  - Chemical properties of soils.
  - Soil characterization by analysis.
  - Soil fertility assessment.
- Characteristics and management of problem soils.
- Soil-plant-water relationships.
- Testing and interpretation of soil and plant tissue analyses.

# Project Portfolio

| Project | Objective | Collaborators | Location |
|---|---|---|---|
| Agricultural Input Markets Strengthening (AIMS) | To provide training and technical assistance to improve the efficiency and profitability of private enterprises engaged in agri-input supply | IITA, ICRISAT, CNFA | Mozambique |
| Uganda Agricultural Productivity Enhancement Program (APEP) | To expand economic opportunities in the agricultural sector by improving productivity and marketing of key food and cash crop systems | Agri-input suppliers, distributors, and users (Chemonics) | Uganda |
| Accelerated Sustainable Agriculture Program (ASAP) | To develop Afghanistan's agri-input marketing system and build on RAMP's success | Agri-input dealers, Afghanistan's Ministry of Agriculture, Irrigation, and Livestock (Chemonics) | Afghanistan |
| Business Development Services Fund—Micro, Small, and Medium Enterprises Project | To deliver business development and advisory services | Business development service providers; micro, small, and medium enterprises | Nigeria |
| Batken and Sughd Agri-Input Dairy Development (BSAIDD) | To improve productivity and profitability of cheese and dairy farmers, reduce rural poverty, and increase stability | Agri-input dealers, trade associations, cheese and dairy farmers (DAI/Winrock) | Kyrgyz Republic, Tajikistan |
| Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability (CATALIST) | To promote peace and environmental stability by improving soil fertility, enhancing farm production, and increasing trade | Farmer organizations, national and international NGOs, such as Helpage | Great Lakes Region of Central Africa |
| Cluster and Business Support (CBS) | To stimulate economic growth and improve employment opportunities by strengthening the agribusiness environment | Agri-input dealers, trade associations (Chemonics) | Kosovo |
| Cereal Production Information and Decision Support Systems (CPIDS) | To reduce farmer poverty through increased income, greater food availability, and reduced risks by improving agricultural planning and decision making | Farmers, policymakers, NARS | Morocco, Syria |
| Combating Soil Fertility Decline to Implement Smallholder Agricultural Intensification (CSD-ISFM) | To improve the livelihoods of smallholder farmers by promoting a holistic natural resource management approach to agricultural intensification | TSBF-CIAT, NARES, NGOs, credit sources, farmer organizations | Sub-Saharan Africa, West Africa |
| East and Central Africa Maize and Wheat Network Project | To evaluate maize varieties, enhance soil fertility, conserve soil moisture, and control Striga | NARS scientists (CIMMYT) | Ethiopia |

# Project Portfolio
(Continued)

| Project | Objective | Collaborators | Location |
|---|---|---|---|
| Establishment of the Cocoa Abrabopa Association in Ghana | To provide technical assistance and training in business skills, association building, and input use | TechnoServe, Wienco, and the Cocoa Research Institute of Ghana | Ghana |
| Food for Agricultural Revitalization and Market Systems (FARMS) | To introduce technologies and nutrient management practices to improve crop production for staple crops such as wheat and maize | Afghanistan's Ministry of Agriculture, Irrigation, and Livestock | Afghanistan |
| Food for Progress Program (FFP) | To provide technical assistance and market development support to agribusiness enterprises engaged in feed milling, meat, dairy, and egg production and to establish an agribusiness credit guarantee fund | Agri-input dealers ABMC and banks | Albania |
| Fertilizers and Sustainable Agricultural Development (F&SAD) | To improve access to and efficient use of agricultural inputs, particularly fertilizers in West Africa | Producer organizations, agri-input dealers, associations | Mali |
| Impact of Urea Deep Placement (UDP) in Bangladesh | To train extension workers and farmers in urea deep placement (UDP) technology. To train people in the manufacture of urea briquettes | Bangladesh Department of Agricultural Extension (DAE) | Bangladesh |
| Improvement of Competitiveness of the Cotton Sector in Benin | To strengthen the capacities of village-level producer groups, reduce rural poverty, and increase sustainability of cotton production and natural resource management | Farmer groups | Benin |
| Improving Efficiency of Water and Plant Nutrient Materials | To conduct research on greenhouse tomatoes using drip irrigation in conjunction with different fertilization schemes, which include fertigation and fertilizer deep placement | FARMS project | Headquarters, Muscle Shoals, Alabama, U.S.A. |
| Innovation Aiming at Improved Rural Livelihoods in the West African Savannah Zone | To increase agricultural productivity, reduce poverty, and contribute to sustainable use and conservation of natural resources | FARA | West African Savannah Zone |
| Interactive Effects of Land Management and Soil Macro-Faunal Biodiversity on Physical and Hydrological Soil Properties Determining Nitrogen and Water Use Efficiency in West and East Africa Ecosystems | To determine how land management and macrofaunal biodiversity in the soil affect soil properties | Farmers, Wageningen University, University of Bobo Dioulasso, and University of Nairobi | Burkina Faso, Kenya, and Ghana |
| Knowledge Management for Natural Resource Use and Environmental Protection | To identify constraints and opportunities for effective knowledge management strategies in Benin and Togo | Royal Tropical Institute (KIT) of the Netherlands | Benin and Togo |

# Project Portfolio
(Continued)

| Project | Objective | Collaborators | Location |
|---|---|---|---|
| Kyrgyz Agro-Input Enterprise Development Project (KAED) | To support the development of agri-input dealers and increase agricultural production through the use of improved technologies | Agri-input dealers, decision makers | Kyrgyz Republic |
| Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites (MARKETS) | To increase agricultural productivity, enhance value-added processing, and increase commercialization through private sector-led and market-driven growth and development | Producers, importers and wholesale/retail agri-input dealers, farmers (Chemonics) | Nigeria |
| Marketing Inputs Regionally (MIR) | To strengthen the private sector and create a regional market in West Africa | UEMOA, ECOWAS, private input importers and dealers, Sector Ministries | Burkina Faso, Benin, Ghana, Mali, Nigeria, Togo |
| Maize Intensification in Mozambique (MIM) | To help smallholder farmers to intensify maize production through increased fertilizer use and to strengthen the entire value chain through linking farmers with agri-input suppliers and traders | International Maize and Wheat Improvement Center (CIMMYT), marketing companies, NGOs, and farmer and producer organizations | Mozambique |
| Strengthening Regional Networks of Market Information Systems and Trader Organizations in West Africa Africa (MISTOWA) | To improve the collection and dissemination of market information and strengthen trader organization networks | Several West African regional organizations, Agriterra, Geekcorps | West Africa |
| Local Development Support Project for the Provinces of Comoé Léraba, and Kénédougou (PADL/CLK) | To reduce rural poverty by improving soil fertility and facilitating agribusiness clusters and commodity chain development | African Development Bank | Burkina Faso |
| Decentralized and Participatory Rural Development Project in the Provinces of Bazega and Kadiogo (PDRDP/BK) | To reduce rural poverty by improving soil fertility and increasing farmers' incomes | Farmer organizations, Ministry of Agriculture | Burkina Faso |
| Project for the Development of the Rural Southwest of Burkina Faso (PDRSO) | To introduce integrated soil fertility management options in large investment projects | NARS, national NGOs | Burkina Faso |
| Strategic Alliance for Agricultural Development in Africa (SAADA) | To develop, with the Dutch Goverment, competitive agricultural systems and viable agri-enterprises based on sustainable intensification of agricultural production, with a special focus on women and trade capacity building | AISSA Network, producer organizations | Sub-Saharan Africa |

# Project Portfolio
(Continued)

| Project | Objective | Collaborators | Location |
|---|---|---|---|
| Southeast Climate Consortium Project | To develop a climate information and decision support system for the Southeastern U.S.A. that will contribute to an improved quality of life, increased profitability, decreased economic risks, and more ecologically sustainable management of agriculture, forestry, and water resources. | Florida State University, University of Florida, University of Miami, University of Georgia, Auburn University, University of Alabama-Huntsville | U.S.A. |
| Strengthening Trade at the Regional Level (STAR) | To promote agricultural growth through improved regional trade in inputs | COMESA | Eastern and southern Africa |
| Technical Backstopping of African Development Bank Investment Projects | To facilitate sustainable agricultural intensification, with a special focus on integrated soil fertility management | Ministries, farmers | Benin, Burkina Faso |
| West Africa Cotton Improvement Program (WACIP) | To improve food security and lessen poverty for cotton farmers and their families in West Africa | Abt Associates, Aid to Artisans, Auburn University, Michigan State University, Tuskegee University | Benin, Burkina Faso, Chad, and Mali |
| From Thousands to Millions (1000s+) | To increase agricultural productivity and economic growth for 1 million farm families (10 million people) in West Africa as the main component of the Strategic Alliance for Agricultural Development in Africa (SAADA) | Agribusiness clusters, producer organizations, business support services, farmers, AgriCord | Burkina Faso, Ghana, Mali, Niger, Nigeria, Togo |

# Publications and Major Presentations, 2007/08

## Publications

FSR-1 *Africa Fertilizer Situation.*

FSR-2 *Asia Fertilizer Situation.*

FSR-5 *North America Fertilizer Capacity*.

FSR-7 *Worldwide Urea Capacity Listing by Plant*.

FSR-8 *Worldwide DAP and MAP Capacity Listing by Plant*.

FSR-9 *Worldwide Potash Capacity Listing by Plant*.

FSR-10 *Worldwide Ammonia Capacity Listing by Plant*.

FSR-14 *Worldwide Ammonium Nitrate and Calcium Ammonium Nitrate Capacity Listing by Plant.*

FSR-16 *Global and Regional Data on Fertilizer Production and Consumption, 1961/62–2005/06*.

FSR-19 *Former Soviet Union Fertilizer Situation.*

FSR-20 *North America Fertilizer Situation.*

FSR-22 *Worldwide NPK Capacity Listing by Plant*.

FSR-23 *Worldwide Phosphoric Acid Capacity Listing by Plant*.

G-1 *IFDC Publications Catalog*.

S-30 *IFDC Corporate Report 2006/07*.


Breman, H., B. Fofana, and A. Mando. 2007. "The Lesson of Drente's 'Essen': Soil Nutrient Depletion in Sub-Saharan Africa and Management Strategies for Soil Replenishment," IN Land Use and Soil Resources. A.K. Braimoh and P.L.G. Vlek (Eds.), pp. 145–166, Springer Science + Business Media B.V., Bonn, Germany.

Dangbégnon, C., M. Issaka, and A. Mando. 2007. "Interorganizational Platform to Support the Development and Adaptation of ISFM Innovation in Farmer Communities in Niger," Peer review paper presented at the International Conference on the Agricultural Innovation in Dryland Africa (AIDA), Accra, Ghana, January 22–24, 2007.

Fofana, B., M.C.S. Wopereis, A. Bationo, H. Breman, and A. Mando. 2008. "Millet Nutrient Use Efficiency as Affected by Natural Soil Fertility, Mineral Fertilizer Use and Rainfall in the West African Sahel," *Nutrient Cycling in Agroecosystems*, 81:25–36.

Francisco, E.A.B., S. H. Chien, L. I. Prochnow, E. R. Austin, M.C.M. Toledo, and R. W. Taylor. 2008. "Characterization and Greenhouse Evaluation of Brazilian Calcined Nonapatite Phosphate Rocks for Rice," *Agronomy Journal*, 100(3):819–829.

Gregory, I., A. Roy, and M. Eilitta. 2008. "Fertilizer Access: Vouchers and Markets Working Together," Paper presented at the 76th International Fertilizer Industry Association (IFA) Conference, Vienna, Austria, May 19–21, 2008.

Groot, R., M. Eilitta, and B. Bumb. 2008. "Fertilizer Market Development in Sub-Saharan Africa," Paper presented at the Fertilizer Society of South Africa (FSSA) Annual Congress, Pretoria, South Africa, June 6, 2008.

# Publications amd Major Presentations, 2007/08 (continued)

## Publications (Continued)


Kapoor, V., U. Singh, S. K. Patil, H. Magre, L. K. Shrivastava, V. N. Mishra, R. O. Das, V. K. Samadhiya, and R. Diamond. 2008. "Rice Growth, Grain Yield, and Floodwater Nutrient Dynamics as Affected by Nutrient Placement Method and Rate," *Agronomy Journal*, 100(3):526–536.

Mando, A. 2008. "Improving Soil Productivity Through Nutrient Management," *FIDAction*, 10. <http://www.ifad.org/newsletter/pa/e/10.htm>.

Nijhoff, J., I. Gregory, A. Roy, and B. Bumb. 2008. "Fertilizer Regulatory Mechanisms—Global Experience," Paper presented by L. Maene to the Fertiliser Association of India (FAI)/IFA Roundtable Discussion Meeting, New Delhi, India, March 2008.

Roy, A. 2008. "Agricultural Development and Long-Term Solutions to the Food Crisis," Paper presented before the House Hunger Caucus, Washington, D.C., U.S.A., June 5, 2008.


## Major Presentations


Crane, D. 2007. "Food Security Driven by Agricultural Inputs and Farming Technology: The Fertilizer Perspective," Presentation at the Corporate Council on Africa, Chicago, Illinois, U.S.A., June 25, 2007.

Dangbégnon, C. 2007. "Multi-Stakeholder Approach to Linking Technical Options, Policy, and Market Access for Improved Land Productivity in the NGS." Presentation for the Northern Guinea Savannah (NGS) Task Force on the Operationalization of the Innovation Platform to Improve Farmer Livelihoods at the Side Event of the Forum for Agricultural Research in Africa (FARA) 4th General Assembly, Johannesburg, South Africa, June 10–16, 2007.

Roy, A. 2007. "Fertilizers and Agricultural Intensification: IFDC's Experiences," Presentation at the Fertilizer Association of India Annual Seminar, New Delhi, India, December 5–7, 2007.

Roy, A. 2007. "Improving Access to Fertilizers," Presentation at the International Workshop on Strengthening and Widening Markets and Overcoming Supply Side Constraints for Africa Agriculture, Lusaka, Zambia, June 3–5, 2007.

Roy, A. 2008. "Specific Measures in Agriculture Development Support Issues Related to Fertilizers," Presentation at the Tokyo International Conference on African Development (TICAD) Agriculture Experts' Meeting, Tokyo, Japan, March 26–27, 2008.

Roy, A., and D. Crane. 2007. "Fertilizers: Key to Achieving Hunger and Poverty Goals in Africa," Presentation at the Fertilizer Outlook and Technology Conference, Tampa, Florida, U.S.A., November 5–11, 2007.

# Financial Highlights

**The following is a summary of financial information for the year ended December 31, 2007. The full financial statements and the independent auditors' reports are available from IFDC upon request.**

**Balance Sheet**

**For the year ended December 31, 2007**

| | US $'000 |
|---|---|
| **Assets:** | |
| Cash and cash equivalents | 6,504 |
| Restricted cash | 5,415 |
| Contribution receivable | 1,058 |
| Contracts receivable, net of allowance for doubtful accounts | 1,119 |
| Other receivables | 400 |
| Supplies inventory | 120 |
| Prepaid expenses and advances | 1,620 |
| Total current assets | 16,236 |
| Buildings and equipment, net | 135 |
| Contributions receivable, noncurrent | |
| Total assets | 16,371 |
| **Liability and Net Assets:** | |
| Accounts payable | 441 |
| Accrued annual and sick leave | 928 |
| Deferred revenue | 7,465 |
| Other liabilities | 5,441 |
| Total current liabilities | 14,275 |
| Unrestricted net assets | 2,088 |
| Permanently restricted net assets | 8 |
| Total liabilities and net assets | 16,371 |

**Statement of Revenue and Expenses**

**For the year ended December 31, 2007**

| | US $'000 |
|---|---|
| **Revenue and Support:** | |
| Agriterra | 290 |
| Chemonics International Inc. | 1,066 |
| Dutch Embassy of Benin | 318 |
| Dutch Embassy of Rwanda | 3,384 |
| Int. Crop Research Institute for the Semi-Arid Tropics (ICRISAT) | 764 |
| International Fertilizer Industry Association | 233 |
| International Fund for Agricultural Development | 874 |
| Netherlands Minister for Development Cooperation (DGIS) | 4,144 |
| The Fertilizer Institute | 132 |
| The Rockefeller Foundation | 398 |
| The William and Flora Hewlett Foundation | 238 |
| Shell Canada Energy | 1,568 |
| U.S. Agency for International Development | 7,443 |
| U.S. Department of Agriculture | 1,864 |
| Winrock International | 280 |
| Training Programs | 135 |
| Others | 2,096 |
| Total revenues and support | 25,227 |
| **Expenses:** | |
| Field programs | 11,530 |
| Research and market development | 10,688 |
| Support activities | 3,217 |
| Total expenses | 25,435 |
| **Decrease in unrestricted net assets** | **(208)** |

# Revenue Sources

AGROGEN, S.A. de C.V.
Agriterra
Alliance for a Green Revolution in Africa (AGRA)
Bill & Melinda Gates Foundation
Bureau of Alcohol, Tobacco and Firearms
International Maize and Wheat Improvement Center (CIMMYT)
Chemonics International, Inc.
Common Fund for Commodities
Development Alternatives, Inc. (DAI) – Afghanistan
Deepak Fertilizers and Petrochemical Corporation Ltd.
Dutch Foundation for the Advancement of Tropical Research (WOTRO)
Forum for Agricultural Research in Africa (FARA)
Georgia Pacific Resins, Inc.
Government of Bangladesh
Government of Burkina Faso
International Atomic Energy Agency (IAEA)
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
International Fertilizer Industry Association (IFA)
International Food Policy Research Institute (IFPRI)
International Fund for Agricultural Development (IFAD)
International Plant Nutrition Institute (IPNI)
International Potash Institute (IPI)
International Raw Materials Ltd.
Le Programme Diversification et Compétitivité Agricoles (PCDA)
Millennium Development Authority (Ghana)
Ministry of Agriculture of Peru
Nagarjuna Fertilizers and Chemicals Limited
National Programme for Food Security – Nigeria
Netherlands Ministry for Development Cooperation (DGIS)
Notore Chemical Industries
Projet d'Appui à la Gestion de Forêts Communales (PAGEFCOM) – Government of Benin
Royal Netherlands Embassies in Rwanda, Benin, and Ghana
Shell Canada Energy
Swiss Cooperation Bureau (Burkina Faso)
The Fertilizer Institute (TFI)
The Rockefeller Foundation
United States Agency for International Development (USAID)
United States Department of Agriculture (USDA)
Unity Envirotech
University of Georgia
University of Missouri
U.S. Borax, Inc.
William and Flora Hewlett Foundation

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(as of June 30, 2008)

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1. Left during 2007/08.
2. Retired during 2007/08.
3. Short-term staff, 2007/08.
4. On extended leave.
5. Deceased, 2007/08.
6. Student Attachment.

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1. Left during 2007/08.
2. Retired during 2007/08.
3. Short-term staff, 2007/08.
4. On extended leave.
5. Deceased, 2007/08.
6. Student Attachment.

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***(Office closed March 31, 2008)***

1. Left during 2007/08.
2. Retired during 2007/08.
3. Short-term staff, 2007/08.
4. On extended leave.
5. Deceased, 2007/08.
6. Student Attachment.

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4. On extended leave.
5. Deceased, 2007/08.
6. Student Attachment.

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(as of June 30, 2008)

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Essien Henry Ekpiken, Project Coordinator – AND
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Emmanuel Meda, Driver – 1000s+
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Ibrahim Mohammed, Input Specialist – MARKETS
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Emile Kalume, Driver
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1. Left during 2007/08.
2. Retired during 2007/08.
3. Short-term staff, 2007/08.
4. On extended leave.
5. Deceased, 2007/08.
6. Student Attachment.

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(as of June 30, 2008)

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***(Office closed September 2007)***

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Md. Lokman Ali, Training, Implementation and Monitoring Officer
Md. Abdul Baten, Training Specialist[3]
Md. Bodiuzzaman, Training, Implementation and Monitoring Officer
Kh. Makbul Elahi, Field Coordinator
Md. Tariq Hassan, Agronomist[3]
Syed Afzal Mahmood Hossain, Data Management Specialist
Syed Arshad Hossain, Training, Implementation and Monitoring Officer
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Muhammad Masud Rana, Training, Implementation and Monitoring Officer
Md. Aminur Roshid, Training, Implementation and Monitoring Officer
Md. Abdur Rouf, Training, Implementation and Monitoring Officer
Bimal Krishna Sikder, Training, Implementation and Monitoring Officer

1. Left during 2007/08.
2. Retired during 2007/08.
3. Short-term staff, 2007/08.
4. On extended leave.
5. Deceased, 2007/08.
6. Student Attachment.

# Global Offices and Staff

(as of June 30, 2008)

## Europe

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James R. Stanelle, Seed Specialist[3]

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Dalil Batyrov, Business Development Assistant/Media Relations
Ylli Bicoku, Livestock Nutritionist[3]
Djihongir Djumabaev, Training Specialist
Alisher Kasymov, General Manager
Brian Kiger, MIS Agriculture Inputs Specialist[3]
Luisa Mamarasullova, Business Development Specialist[1]

### IFDC/Tajikistan

***(Office closed August 2007)***

1. Left during 2007/08.
2. Retired during 2007/08.
3. Short-term staff, 2007/08.
4. On extended leave.
5. Deceased, 2007/08.
6. Student Attachment.

# Board of Directors

(as of June 30, 2008)

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(as of June 30, 2008)

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IFDC

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# IFDC Profile

## What Is IFDC?

- An international center for soil fertility and agricultural development.
- A nonprofit, public international organization—combining state-of-the-art research and development to address global issues such as:
  - → Alleviation of global poverty
  - → Promotion of economic development
  - → Reduction of hunger
  - → Protection of the environment
- Collaborative programs and partnerships that enrich and sustain lives and livelihoods of poor people globally.
- Unique research capabilities and market development and training skills, which enable IFDC to develop incentive-based programs customized for local needs and problems.

## Mission

To increase agricultural productivity in a sustainable manner through the development and transfer of effective and environmentally sound plant nutrient technology and agricultural marketing expertise.

## Staff and Facilities

- International, multidisciplinary staff and physical facilities uniquely suited for conducting a broad range of research and development activities in sustainable food systems.
- Scientists and professionals that provide a unique mix of applied research, technology transfer, and market development capabilities.
- Activities conducted in collaboration with national and international organizations.
- Access to a wide variety of facilities worldwide.
- Specialized research laboratories, greenhouses, growth chambers, specialized instruments essential for laboratory research, bench-scale and pilot-plant units, training facilities, technical library, scientific information services, and a word processing center.

## Capabilities

- A problem-solving, results-oriented organization with a 30+-year track record of providing a broad range of services in technical assistance, research, and training to more than 130 countries.
- Broad range of projects:
  - → Engineering and technology
  - → Management information systems
  - → Nutrient management
  - → Policy reform
  - → Market development
- Practical, unbiased solutions to challenges confronting decision makers of the world's public and private agricultural sectors in the most cost-effective and efficient manner.

# Partners, Funding, and Locations

## Partners

- Collaborative work with IARCs, numerous national organizations, the private sector, and NGOs.

- Partners and clients:
  → Bilateral and multilateral development agencies
  → Host-government institutions
  → Private enterprises

## Funding

- Funding sources include bilateral and multilateral development agencies, private enterprises, foundations, and other organizations. Additional revenue is generated from long-term, donor-funded, market development projects involving transfer of policy and technology improvements in emerging economies.

## Locations

A listing of our global offices begins on page 71.

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