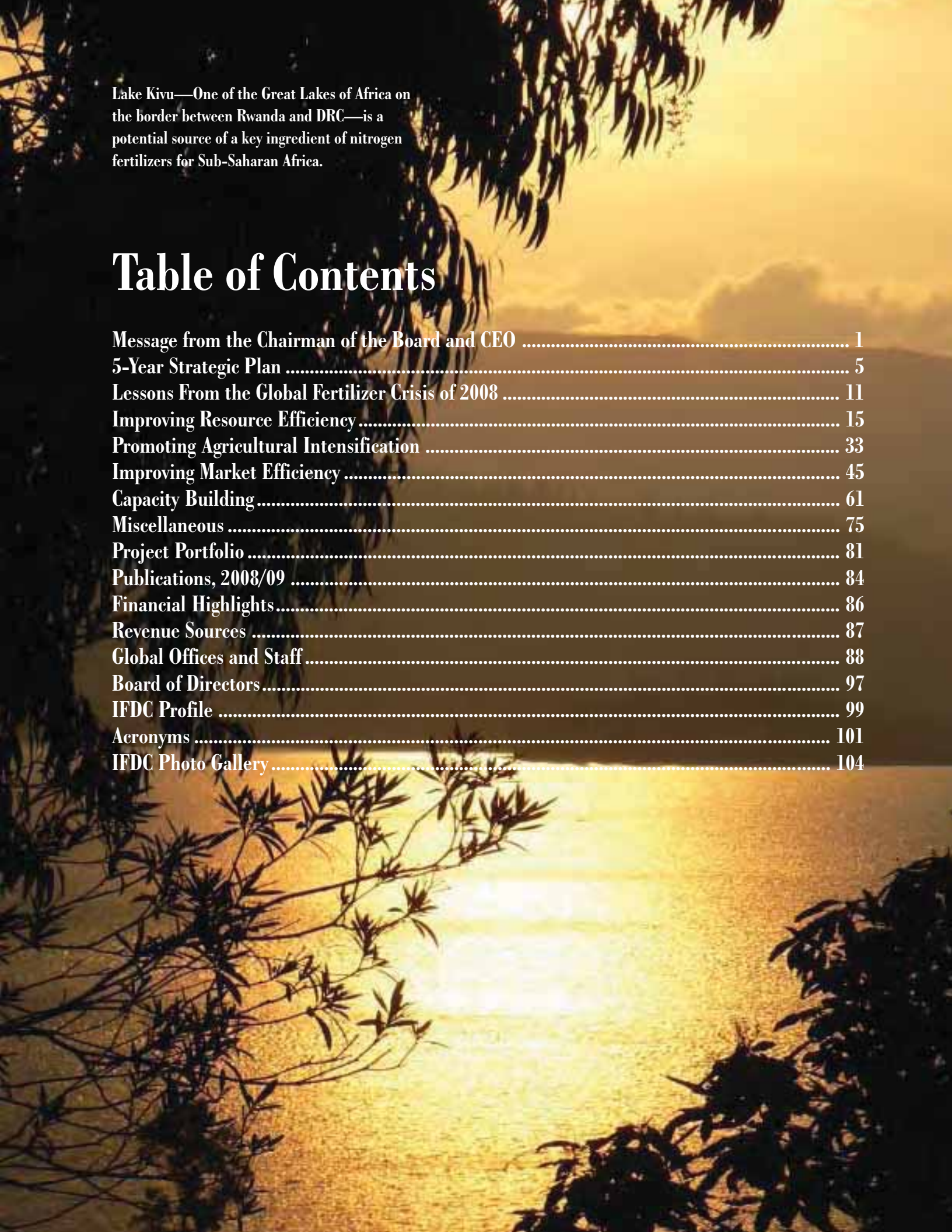
IFDC Corporate Report 2008/09

Improving Efficiency Along the Agricultural Value Chain



Lake Kivu—One of the Great Lakes of Africa on the border between Rwanda and DRC—is a potential source of a key ingredient of nitrogen fertilizers for Sub-Saharan Africa.

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M. Peter McPherson

- ***The worldwide spread of urea deep placement technology helps meet an urgent challenge: to increase fertilizer efficiency***

Multiple international crises occurred during 2007 and 2008. Prices of food, energy, and agricultural inputs such as fertilizers soared to all-time highs. This caused enormous hardships for the poor and vulnerable in developing countries and added 115 million more people to the 800 million already living in extreme poverty.

Amit H. Roy

Then in late 2008, world fertilizer prices plummeted almost as suddenly and unexpectedly as they had risen—but not for poor farmers, especially in Sub-Saharan Africa. Carry-over stocks were bought at the previous high prices, and there was a lag in suppliers' response to the price changes. A farmer in Togo must still pay two or three times as much for a kilogram of urea fertilizer as a farmer in Iowa—and the nutrient-depleted soils that the Togolese farmer tills need the nutrients far more than Iowa soils.

The 2008 crisis was a wake-up call for the world community at large. For the first time, agriculture and world food security were among the key issues discussed at the annual G-8 Summit of the world's economic leaders, held in Italy in July 2009. The G-8 nations agreed to increase their commitment to the fight against world hunger from the current $15 billion annually to $20 billion over the next 3 years—a welcome move, considering that investments in international agricultural research and development have decreased significantly over the past 2 decades.

Mineral fertilizers provide the nutrients that account for 40% to 60% of all increased food production resulting from modern agriculture. Fertilizers are critical to future sustainable growth in agricultural productivity. But the dwindling supply and high prices of fertilizer resources, including energy, mean that we can no longer rely on current energy-wasteful methods of fertilizer production and use.

The turmoil of 2007–08 emphasizes that to achieve sustainable food production and reduce environmental impact, we must increase the efficiency of the natural resources needed by farmers to grow the world's food supply while protecting our global environment.

Improving Efficiency Along the Value Chain

IFDC works worldwide to increase the efficiency of food production along the value chain—from the seeds that farmers plant to the marketing of their harvests. Our main focus is what we know best: improving the efficiency of use and availability of nutrients, mainly through fertilizers. We document many of our initiatives in this year's Corporate Report.

At IFDC headquarters we're testing the nutrient delivery and potential environmental impacts of new and modified fertilizer products, comparing them with conventional fertilizers. With some new products, nitrogen losses to the air through volatilization are 35% to 50% less than with urea, and losses to groundwater through leaching are 25% to 35% less.

Since 2006, CATALIST—*Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability in the Great Lakes Region of Central Africa*—has worked to increase social and environmental stability through agricultural intensification in Burundi, eastern Democratic Republic of Congo (DRC), and Rwanda. CATALIST helps farmers integrate the use of mineral fertilizer and complementary inputs to ensure that food requirements are met through increased productivity of presently cultivated land. The project works to improve the efficiency and effectiveness of agricultural input markets, promote mineral fertilizer use, and improve farmers' access to credit and market information. CATALIST is also increasing and improving market opportunities for agricultural products and promoting value chain development.

The *From Thousands to Millions* (*1000s+)* project links West African farmers to markets through expansion of the *Competitive Agricultural Systems and Enterprises (CASE)* approach, which promotes agribusiness cluster formation, commodity chain development, and strengthening of public and private institutions' abilities to enable trade and agribusiness.

1000s+ is increasing agricultural productivity and economic growth for more than 600,000 farmers in 220,000 households by stimulating trade along the value chain, developing input and output markets, and improving soil fertility in Benin, Burkina Faso, Ghana, Mali, Niger, Nigeria, and Togo.

About 250 million preschool children in Sub-Saharan Africa suffer from vitamin A deficiency. Many go blind. Vegetables can help overcome such vitamin deficiencies. IFDC is working to improve the efficiency of delivery of plant nutrients to vegetables near urban centers in Burundi, Ghana, and Rwanda through the *Innovative Fertilizers for Peri-Urban Farmers* project.

In Kyrgyzstan, the *Kyrgyz Agro-Input Enterprise Development* project, or KAED, is helping farmers increase production of two staple foods: wheat and milk. KAED has reached 300,000 farmers and helped open 35 agri-input stores in the former communist country.

These are just a few examples of how IFDC is working to increase the productivity and profitability of smallholder farmers in developing economies.

Making Fertilizers More Easily Available to Poor Farmers

IFDC played a key role in the 2008 reopening of the only major urea manufacturing plant in Sub-Saharan Africa, which was built in 1988 in the Niger Delta of Nigeria but closed in 1996. The giant urea plant, then among the world's largest, resumed production as *Notore* ("genesis" in local dialects) in 2009. Notore now produces 1,000 metric tons (mt) per day of ammonia, 1,500 mt of urea per day and 1,800 mt per day of NPK. Nigerian farmers will use 60% and the rest will be sold to fertilizer-deficient countries in West and Central Africa.

Lake Kivu, on the border of Rwanda and DRC, contains huge amounts of dissolved gases, mostly carbon dioxide and methane—feedstock for production of nitrogen fertilizers. Fertilizers are particularly expensive in Rwanda and other Central African countries. This is due in part because almost all are imported through ports in Kenya and Tanzania and then have to be transported hundreds or thousands of miles, often on poor roads. IFDC is helping the Rwandan Government determine the feasibility of using Lake Kivu gases for large-scale fertilizer production to supply desperately needed urea to farmers in the Great Lakes Region of Central Africa.

Using Information Technology to Fight World Hunger

IFDC is also applying the newest information technology to improve farming in the developing countries.

FertTrade is a new analytical software tool that IFDC economists have developed to forecast and evaluate changes and trends in the global demand, production, and trade of NPK fertilizer nutrients. Returns

from FertTrade use could be high. For example, increasing the efficiency of nitrogen fertilizer use could reduce worldwide nitrogen losses to the environment by about 9.3 million mt by 2025—a saving of about $10.1 billion in that year alone.

African farmers and traders are now using mobile phones to text-message free listings of offers to buy or sell farm produce and inputs through *TradeNet*, renamed *Esoko* ("electronic market" in Kiswahili) in 2008. IFDC, its partners, and others in the private sector helped establish the Web-based market information platform in 2007.

IFDC is also launching www.AfricaFertilizer.org. This global Web portal will disseminate and exchange information necessary for agricultural intensification, including development of fertilizer and commodity markets, across Africa. The interactive *AfricaFertilizer.org* will have search engines and provide for discussions on the important role of fertilizer and other inputs in agricultural development in Africa.

Urea Deep Placement: Spreading From Bangladesh to Africa, Eastern and Central Asia, South America

This Corporate Report describes a range of our initiatives, but we want to specifically point out *urea deep placement* or *UDP*. This simple IFDC-developed technology cuts nitrogen losses from the fertilizers farmers apply by 40%, thus reducing air and water pollution, while increasing farmers' yields by at least 20%.

Bangladeshi farmers are using UDP on 500,000 hectares (ha) of irrigated rice, the country's primary staple crop.

The Government of Bangladesh, with IFDC support, is now expanding UDP technology to about 1.5 million farmers on an additional 1.0 million ha.

The adoption of UDP technology by Bangladeshi farmers is spreading rapidly due to two main benefits—increased yields and lower expenditures on fertilizer—both a result of improved nitrogen "uptake" efficiency afforded by the larger urea particle size and the "point placement" method of application. Most farmers broadcast urea directly into the floodwater of lowland rice. But two of every three of those bags of urea are wasted—the nitrogen volatilizes into the atmosphere to become greenhouse gases or leaches to pollute the groundwater.

IFDC's UDP manufacturing technique concentrates urea into "briquettes" that farmers place into the rice root zone while transplanting. The rice plants absorb the vital nitrogen more directly as the concentrated briquette slowly dissolves. This process significantly lowers the amount of urea that volatilizes into the atmosphere or disappears into the groundwater.

Farmers like UDP because it saves them money. They only have to fertilize the rice once instead of two or three times (broadcast method) and fewer weeds grow with UDP application. Simply put, farmers use less fertilizer while increasing their yield. Governments see UDP as a way to make expensive fertilizer go further and save scarce foreign exchange by reducing fertilizer imports.

UDP has another advantage for poor countries where unemployment is high. The manufacture of urea briquettes is labor-intensive. IFDC engineers designed a simple machine to mold urea into briquettes. Establishing village-level businesses to manufacture simple briquette-making machines, as well as briquettes themselves, is part of the IFDC strategy. By the spring of 2009, IFDC had trained more than 1,100 briquette producers who were using 2,400 machines to produce urea briquettes across Bangladesh.

The world is beginning to notice what is happening in Bangladesh. Thousands of Cambodian and Vietnamese farmers have adopted UDP technology for their rice crops.

In 2008 IFDC colleagues began testing UDP widely outside of South and Southeast Asia. IFDC partly catalyzed the spread of UDP by arranging for West African scientists, policymakers, business entrepreneurs, and extension workers to visit Bangladesh and see the technology for themselves. UDP demonstration trials were immediately established in Burkina Faso and Mali. More UDP demonstration trials were established in 2009 on farmers' fields across Sub-Saharan Africa: in Madagascar, Niger,

Nigeria, Rwanda, Senegal, and Togo. Demonstration trials are now being established in Burundi and DRC.

UDP is Being Combined with Other Technologies

UDP also began to move beyond urea and outside of the irrigated rice environment in 2009.

In Afghanistan, a new concept is being tested—UDP is being used in combination with drip irrigation technology to conserve water—another scarce and expensive resource in the arid and impoverished nation.

In Bangladesh, IFDC is conducting tests to develop and validate the performance of NPK briquettes by incorporating phosphorous (using diammonium phosphate) and potassium (using muriate of potash) with nitrogen (using urea) to produce NPK briquettes for use in deep placement in rice and vegetable production systems. Similar tests have been performed in Afghanistan with cabbage and tomatoes.

In Guyana, along the northern coast of South America, scientists are testing UDP with direct-seeded rather than transplanted rice.

Cambodia and Vietnam both have briquette machines. In addition, African entrepreneurs have bought briquette machines from Bangladesh.

The Ultimate Reason for UDP's Spread: The Need for New Fertilizer Products and Production Methods

About 75% of the fertilizers and fertilizer technologies now used worldwide were developed or improved during the 1950s to 1970s by scientists and engineers at the Tennessee Valley Authority (TVA) in Muscle Shoals, Alabama, United States (the site of IFDC's headquarters). These products have been the "work-horses" of global agriculture for nearly 50 years.

When these products were developed, energy was abundant and inexpensive. But that is no longer true. Using current manufacturing processes, the energy equivalent of four barrels of oil is needed to produce one ton of urea. But that's not the end of energy inefficiencies. Two-thirds of that fertilizer is lost to the environment and therefore is never used to increase crop productivity.

The fertilizers created or refined in Muscle Shoals have helped increase agricultural productivity around the world and were critical to the Green Revolutions in Asia and Latin America. But the fertilizers that "helped feed the world" must give way to the next generation of fertilizer technologies. Factors such as decreases in the supply of raw materials, increases in the cost of energy, population growth, and escalating environmental concerns drive the need for these new fertilizers.

Call for More Energy-Efficient Fertilizers and Application Technologies

The new fertilizers must be cheaper to produce, use fewer resources, and increase crop productivity more effectively and efficiently. The next generation of fertilizer products and technologies will require investments in research, but the costs will be miniscule compared with the benefits to humanity.

IFDC has both the physical and human resources to do the job. We also have the capacity to build support for a new, vigorous fertilizer research and development program. IFDC is in a unique position to meet this challenge.

We hope you find the 2008/09 IFDC Corporate Report useful. For specific questions, email *general@ifdc.org*.

M. Peter McPherson
IFDC Board Chairman

Amit H. Roy
IFDC President and Chief Executive Officer

IFDC Looks Forward…
Our 5-Year Strategy at a Glance

IFDC's Strategic Framework:
2009–2013

The Context

The global food crisis of 2007-08 clearly demonstrates our vulnerability in the ability to feed the earth's growing population. Many factors caused the food crisis, including drought, rising energy and production costs, population growth, new demand for biofuels, and ironically, income growth, which has led to higher meat consumption in China and India. The impact is grave, for both the urban poor in developing countries and for the poorest of rural dwellers who must buy much of their food.

The food crisis also highlights the worldwide challenges of food insecurity and poverty alleviation. These issues generate calls for immediate and focused action to help the world's poorest people—most of whom are rural—and to increase efforts to achieve the Millennium Development Goals (MDGs). The United Nations identified eight MDGs to spark global development. The food crisis especially emphasizes the need to achieve MDG 1: Eradication of extreme hunger and poverty by 2015. As a result, agriculture has now become the development priority it should be, given that it is the mainstay of the economies and employment in most developing countries.

Fertilizer will be one of the keys to growth in agricultural productivity. But soaring prices and energy demands mean that we can no longer rely on current products and energy-wasteful methods of fertilizer production and use. We must develop more efficient ways to provide vital nutrients to crops. We should also work with institutions that develop crops that use scarce nutrients more efficiently, are more profitable, and help clean up our environment.

Needs are greatest in Sub-Saharan Africa where farmers continually clear more land to produce barely enough to feed their families. Their markets are unreliable and often unprofitable. African farmers use almost no fertilizers or improved seeds—and Africa's soils are increasingly depleted of nutrients, exacerbating the problems they face.

At the other extreme are intensive rice production systems in Asia where excessive use of inputs, particularly fertilizer, causes pollution and reduces profitability not only for farmers, but also for governments that subsidize fertilizer.

We face two challenges if we are to ensure food security and reduce poverty. First, we must intensify agriculture on existing farmland by adopting high-yielding crop varieties, increasing the use of fertilizer and other inputs, practicing better farm management, and providing better market access. Simultaneously, we must conserve our earth's limited resources and minimize pollution from agriculture. This means that we must use our nutrient resources more efficiently.

IFDC's Role

IFDC is a nonprofit public international organization that was established in 1974 to address global food security challenges. In the early days, most IFDC staff were stationed at the Center's headquarters in Muscle Shoals, Alabama, United States.

In the late 1980s, IFDC made two changes to ensure more immediate impact of its programs. IFDC became more directly involved in development with the 1987 establishment of the Africa Division in Lomé, Togo. Simultaneously, IFDC programs were broadened to include strengthening of input markets. Efforts to improve output markets were later included when it became evident that unprofitable markets for farmers' produce was often a barrier to greater input use.

IFDC initiated its new Strategic Framework for 2009–2013 because the changed world environment meant we must re-evaluate the most effective ways to improve the lives of both the rural and urban poor. Today's heightened global commitment to food security, poverty alleviation, and agriculture offers new opportunities for institutions such as IFDC to have large-scale impact. Our new strategy sets forth IFDC's vision of how to best meet new challenges and fulfill the original mandate of focusing on fertilizer issues to improve food security.

IFDC plans to target fertilizer production and use to help achieve MDG 1.

Mission and Objectives

IFDC's *mission* has remained unchanged: *To increase sustainable agricultural productivity through the development and transfer of effective and environmentally sound plant nutrient technology and agricultural marketing expertise.*

Key IFDC *objectives* are:

- Through worldwide field projects, with the backing of research:
  - To increase the efficiency of nitrogen use by 50%, from the current average of 30%–45% to 45%–70%.
  - To increase the yields of staple crops by at least 50%.
  - To increase farm income by 30%–50%.
- Through focused research efforts:
  - To make directly applied phosphate rock as effective as the more expensive water-soluble fertilizers.

IFDC's Approach to Research and Development

IFDC has earned a reputation over the past 35 years for working closely with developing country institutions to achieve impacts that last long after projects end. Our cornerstones for research and development are:

- **Collaboration With the Private Sector**—IFDC's approach to market development emphasizes the private sector as a key actor in the development of productive and profitable agriculture. Farmers are part of the private sector activity. To increase production, farmers rely on inputs distributed by the private sector and on marketing of their output through the private sector.
- **Collaboration With Local, National, and Regional Partners**—IFDC works with diverse and long-term partners at local, national, and regional levels. IFDC's role has been as facilitator of development projects that are led and implemented by local partners.
- **Local Capacity Building**—Local capacity building will continue to be a central component of IFDC's development efforts. Most development assistance is short-term, so it should be structured to assure its continuation afterward.Therefore, IFDC always works to improve local capacity to ensure that local organizations will meet development challenges.

- **Participatory Research and Development**—Participatory research and development is an important component of IFDC work, particularly in field projects in Sub-Saharan Africa. IFDC will continue to work with farmers, our program beneficiaries, to ensure that we focus our research and development on farm-level problems. IFDC will work similarly with other actors such as input dealers and output traders to improve productivity and market development. This ensures not only that the right technologies and methods are being researched and diffused, but also that targeted farmers are motivated and interested and will share best practices with other farmers.

Improving Efficiency and Productivity Across the Value Chain

IFDC will strive to improve the efficiency of both *agri-inputs* and *markets*.

Improving the Efficiency of Key Inputs

Nutrient mining is reducing soil productivity in many developing countries—particularly in Sub-Saharan Africa. Both mineral and organic fertilizers are essential to replace nutrients that growing crops remove. IFDC will continue to focus on improving the efficiency of key inputs that smallholder farmers need to ensure the sustainability of soils and natural resources.

- **Improve Efficiency of Nutrient Use**—The price of nitrogen fertilizer is expected to remain higher than historical averages. Current nitrogen products and application methods are extremely inefficient. In some systems, as much as two-thirds of applied nitrogen escapes into the groundwater or the atmosphere. The unused fertilizer reduces farmers' profits, and the escaped nitrogen becomes a pollutant. The world's known resources of phosphate rock used to produce phosphate fertilizers are alarmingly limited and are expected to be depleted in 130 years or less if we continue with our current usage rates. As the easily available reserves dwindle, phosphates could become the most limiting chemical resource for agricultural production. Research has shown that directly applied phosphate rock can be as effective as the far more expensive water-soluble fertilizers in certain conditions, particularly on acidic soils. Additional research is needed to develop methods for direct use in various agroclimatic conditions across the tropics and subtropics.

- **Develop More Efficient Fertilizer Products**—IFDC is the only public organization with both the mandate and the ability to conduct fertilizer research. Nitrogen and other fertilizer products are produced through energy-intensive processes. With the current high costs of fertilizer and its raw materials, IFDC will direct more resources to the development of the "next generation" of fertilizer products and methods that are more efficient, productive, cost-effective, and environmentally friendly. We will also further deploy technologies that have already been proven to improve fertilizer use efficiency, such as urea deep placement for nitrogen.

- **Improve Efficiency of Water and Nutrient Delivery to Crops**—Agriculture is, by far, the greatest human consumer of water. But agricultural water is becoming scarce in many areas as climate changes and population increases. Additional irrigation is often needed for fertilizer and other inputs to express their full potential. IFDC will increasingly focus on developing management techniques, taking into consideration the interactions between fertilizer and water inputs, to deliver water and fertilizer more efficiently to growing crops. Examples include *fertigation*—the application of fertilizer in irrigation water.

Improving Market Efficiency

IFDC will continue to improve the efficiency of markets in developing countries through a three-part focus that has been developed over the past 15 years. This focus includes efforts to:

- **Improve Efficiency of Input Markets**—Profitable farming for smallholders requires timely access to affordable fertilizers and other farm inputs. Over the past 20 years, IFDC has developed a holistic approach to input market development, which has five pillars: *Policy Environment*, *Human Capital Development*, *Access to Business Finance*, *Market Information*, and *Regulatory Frameworks*. Deficiencies in any pillar can cause poor input sector performance. Therefore, IFDC's approach is to simultaneously improve factors in each of the five pillars. Development of input markets through voucher programs will be further emphasized.

- **Improve Efficiency of Farm Enterprises**—Helping smallholder farmers and their organizations develop the skills needed to manage their farms as enterprises is a relatively new area of IFDC work. This allows farmers to participate more in commercial food production, both to meet their families' food needs and to increase incomes.

  Training in both technical use of inputs and business skills is essential.

- **Improve Efficiency of Output Markets**—Output markets provide the "pull" for input market development. IFDC is increasingly focusing on the development of output markets, mainly for staple crops. International markets are often volatile and difficult to access, so IFDC stresses the need to always consider whether potential national and regional markets are underexploited. IFDC will continue to help farmers identify and access profitable markets, usually through producer organizations, with a focus on information management, and by working with all participants in the agricultural value chain.

Special Initiatives

IFDC will start three new initiatives that will bring together multidisciplinary teams that include economists, agronomists, sociologists, and production engineers. Project activities will be reviewed yearly and the teams will report directly to the IFDC President and CEO. The Program Committee of the IFDC Board of Directors will review progress in the initiatives

Africa Productivity Initiative

- *Background*: Yields of grains and other staple crops in Sub-Saharan Africa are only about 25% of the world average. An African Green Revolution, spearheaded by greater use of fertilizer, improved seeds, and based on good crop management, is urgently needed. This initiative captures the essence of the *Abuja Declaration on Fertilizer for an African Green Revolution*, issued at the Africa Fertilizer Summit in June 2006 in Abuja, Nigeria. Sharpening focus on productivity in IFDC's field-level projects across Africa will bring greater food security and income growth. The Africa Committee of the IFDC Board will review progress in this initiative.

- *Objective*: To double crop yields of assisted farmers.

Nitrogen Efficiency Initiative

- *Background*: The efficiency of nitrogen fertilizer use is as low as 30%, particularly in lowland rice, a crop crucial to feeding growing urban populations. Low nitrogen efficiency stems from both outdated fertilizer

products and inappropriate application methods. In the short term, improving application methods to reduce losses will improve profitability and lower nitrogen pollution to water and the atmosphere.

- *Objective*: To increase the efficiency of nitrogen use, for assisted farmers, to at least 45%, thus increasing profits while reducing pollution.

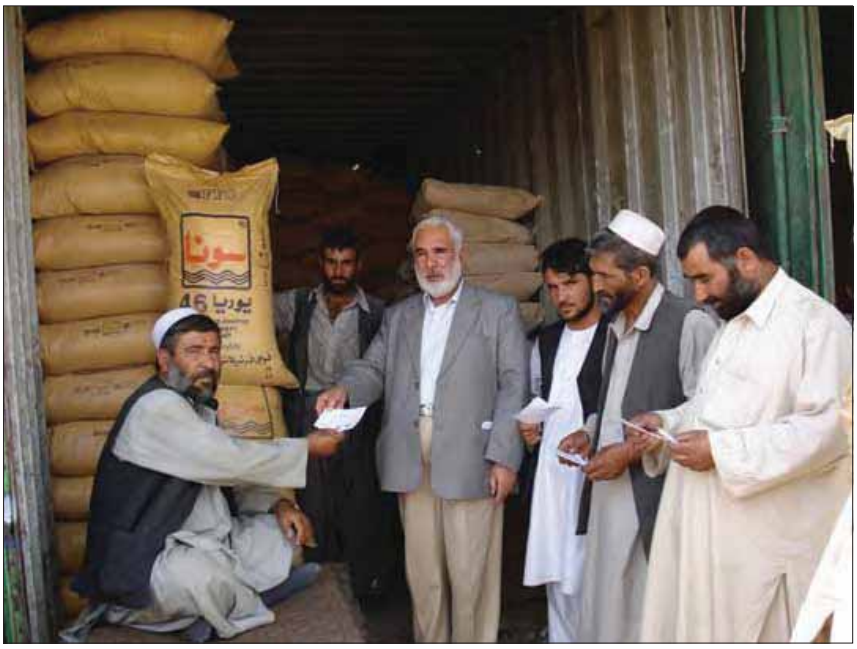
Phosphate Efficiency Initiative

- *Background*: Phosphate reserves are dwindling and conversion to the current suite of water-soluble products is expensive and inefficient. Improving the availability of phosphorus to crops from directly applied phosphate rock in diverse agroclimatic conditions and cropping systems is essential.
- *Objective*: To make directly applied phosphate rock as effective as the more expensive water-soluble fertilizers.

Managing for Results

IFDC is a research organization based on a highly skilled, cohesive cadre of international scientists and development professionals who are motivated by its organizational mission and dedicated to upholding its value system. To achieve these goals, IFDC will improve human resource development through continuous staff training.

IFDC will maintain its cutting-edge position as the world's foremost public institution in the development of fertilizer products. IFDC will place more emphasis on research on fertilizer products and application methods over the next 5 years. IFDC will continuously update its scientific capacity, facilities, and equipment to effectively implement a large research program. IFDC will also keep pace with rapid advances in communication technology to provide better information flow and more opportunities for networking.



Finally, to ensure that our own activities are responsible and sustainable, IFDC will conduct an organizational audit to determine ways to reduce our carbon footprint and improve the efficiency of our energy use.

Lessons From the Global Fertilizer Crisis of 2008—and the Almost Forgotten Crisis of 1974

"This is a *silent tsunami*." That's how the United Nations (UN) World Food Programme aptly described the sudden and seemingly unprecedented spiraling of fuel, food, and fertilizer prices in 2008, says Dr. Balu L. Bumb, Program Leader, IFDC Research and Development Division.

But a similar phenomenon happened before, during the world fuel-food-fertilizer crisis of 1974. Few stakeholders were prepared for the unexpected and, as it turned out, non-sustainable price increases during either period.

"The economic impact of the 2008 crisis was disastrous, creating political instability and unsustainable fiscal burdens in many developing countries," Bumb says. According to the UN Food and Agriculture Organization (FAO), the food crisis of 2008 may have added another 115 million people to the tragic 800 million already suffering from chronic poverty, hunger, and malnutrition.

Fertilizer Crisis of 2008

The price of urea, the world's most widely used fertilizer, rose from $277/mt in August 2007 to $815/mt in August 2008. The price of another widely used fertilizer, diammonium phosphate (DAP), increased even more—from $430/mt to $1,216/mt (Fig. 1, 2004/09 fertilizer prices, *left panel*).

"The high prices made it difficult—often impossible—for hundreds of millions of smallholder farmers to buy fertilizers to grow the food that they needed—first for household survival, then to sell in local markets and contribute to national food security," Bumb says.

Then international fertilizer prices crashed in late 2008, plummeting about as fast as they had risen. But that did not significantly reduce the price that farmers in developing countries pay for desperately needed fertilizer. Prices remained high because carry-over stocks were bought at high prices and there was a lag in suppliers' response to price changes.

Economic Factors Contributing to the Fertilizer Crisis

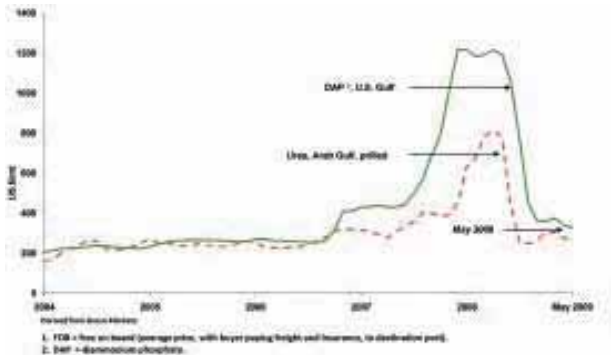
Both supply- and demand-side factors contributed to the surge in fertilizer prices. These factors can be grouped as:

- Higher energy and raw material prices.
- Higher food prices.
- Increased biofuel production.
- The *psychological factor*, which triggered panic in the global food and fertilizer markets.

The economic factors that increased fuel-food-fertilizer prices began in 2006.

History Repeats Itself: Fertilizer, Crude Oil, and Grain Prices During Two Eras

Fertilizer Prices (FOB[1], bulk) 2004–May 2009



Crude Oil and Grain Prices 2004–2009[1]

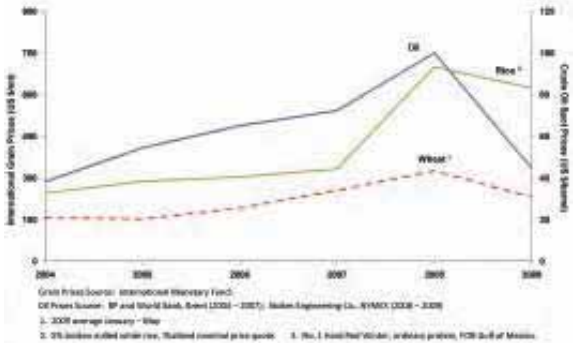
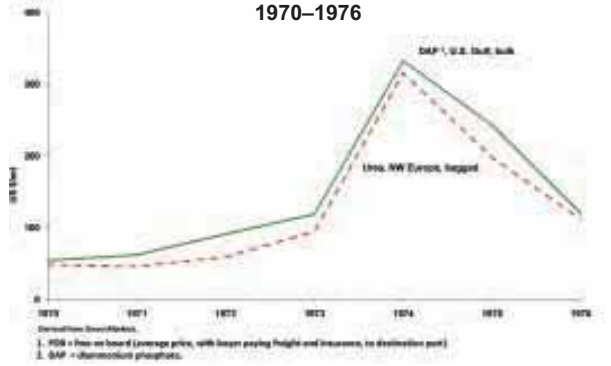


Figure 1. 2004/09. Fertilizer Prices and Crude Oil and Cereal Prices

Fertilizer Prices (FOB[1], bulk) 1970–1976



Crude Oil and Grain Prices 1970–1976

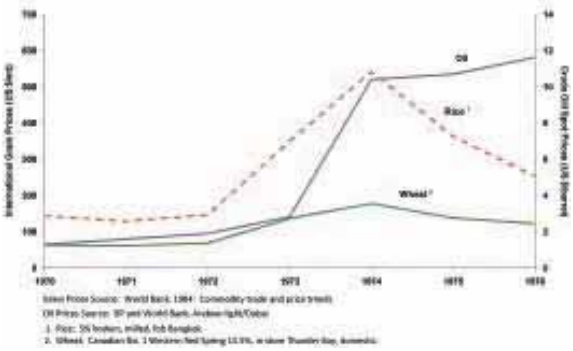


Figure 2. 1970/76. Fertilizer Prices and Crude Oil and Cereal Prices

Supply-Side Factors: Increased fuel and energy costs added to the production costs of fertilizer products, especially nitrogen fertilizers such as urea, whose production is highly energy-intensive. About four barrels of oil-equivalent energy are needed to produce 1 mt of urea. Slow but steady increases in oil prices from 2002 to 2005 contributed to higher fertilizer production costs (Fig. 1, 2004/09 crude oil and cereal grain prices, *right panel*). Higher oil prices also added to food production costs in the developed market economies. Increased prices of raw materials such as sulfur and phosphate rock further added to production costs of fertilizers such as DAP.

Demand-Side Factors: As the cost of food production rose, food demand also rose because of population growth in developing nations and new demands for biofuels. Biofuel demand soon diverted 30% of the U.S. and European corn crop from food to fuel. Also, growing incomes in emerging markets, especially India and China, meant more demand for meat and dairy products. Simultaneously, drought in Australia and floods in Asia reduced production of cereals and other food crops. Increased demand combined with reduced supply put still more pressure on cereal, and thus food, prices (Fig. 1, 2004/09). Food demand drives fertilizer demand, so higher food prices meant that farmers wanted more fertilizers.

Then came panic in the market...

A sudden fear that the global fertilizer supply could not meet demand caused a panic in the world market—which put further pressure on fertilizer prices. The rapidly rising food and fertilizer prices not only alarmed developing countries but threatened several with political instability. Countries began imposing protectionist tariffs and quotas on exports of both fertilizer and food. China imposed 165% tariffs on fertilizer exports while other large countries like India and Brazil were buying fertilizers at any price. Prices of all fertilizer products skyrocketed by 300% to 400% over 6 to 8 months.

Then fertilizer prices started plunging downward—sometimes to below 2007 prices—in October 2008. "Neither the economic fundamentals of supply and demand, nor the health of the global fertilizer industry, supported the phenomenal fertilizer price increases of 2007/08," Bumb says. "And if the world had really been so short of fertilizers, prices would not have fallen so rapidly after October 2008.

"Psychological factors during the first few months of market panic also played a key role in the crisis."

History Repeats Itself

The rapid increase in fertilizer prices, followed by a sudden drop, was not unique to 2007/08, Bumb says. Trends were similar in the first world energy crisis in 1974/75.

Urea prices rose from $59/mt in 1972 to a peak of $316/mt in 1974, and then dropped sharply to $112/mt in 1976. DAP prices also increased from $91/mt to $333/mt, then fell to $120/mt in 1976 (Fig. 2, 1970/76 fertilizer prices, *left panel*).

The rise in fertilizer prices was triggered by a rise in oil prices: from $3/barrel to $12/barrel and then to $36/barrel (Fig. 2, 1970/75 crude oil and cereal prices, *right panel*). The escalating oil prices put pressure on both food and fertilizer prices. Mass starvation was projected in some developing countries.

Increasing fuel-food-fertilizer prices triggered a rush to buy fertilizers, especially in the densely populated countries of Asia.

The Need for Research and Development

In response to the 1970s food-fertilizer crisis, the first World Food Conference was held in Rome in 1974.

The 1970s fertilizer crisis also catalyzed the establishment of IFDC to conduct research and development for new fertilizer products, especially for developing countries.

The high fertilizer prices of the mid-1970s caused a boom in fertilizer investments. Fertilizer production rose from 89.6 million nutrient tons in 1973 to 140.5 million in 1985. During that time, the World Bank provided financial support to many developing countries for both fertilizer import and production.

The Green Revolution

The Green Revolution, brought about by new high-yielding varieties of wheat and rice that responded bountifully to mineral fertilizers, began in the mid-1960s. Food production increased rapidly in the developing countries of Latin America and Asia (although the Green Revolution bypassed the world's poorest region, Sub-Saharan Africa). Demands of the Green Revolution fueled still more fertilizer production.

By the mid-1990s, fertilizer prices were low again and most of the world had surpluses of grain.

The world became complacent and dedicated little attention—and almost no funds—to the development of new fertilizer products.

The current crisis mandates that new energy-efficient fertilizer products be developed to improve nutrient use efficiency in food production and environmental protection. An example might be fertilizers that synchronize nutrient release with crop needs.

Measures to Prevent Another Crisis

To safeguard against future crises and to promote sustainable food security, Bumb recommends the following seven measures.

- ***Do not panic.*** Clearly, both the fertilizer crises of 1974 and 2008 were caused more by market panic than by actual product shortages. To avoid future crises, buyers, especially large buyers who act as "price-makers" in the market, should not act in haste and should not "pay any price" for fertilizers.

- ***Do not distort the market with artificial restrictions.*** During a crisis, policymakers tend to introduce economic distortions such as price controls, rationing, export restrictions, and import quotas. The restrictions worsen a crisis. For example, China's sudden 165% tax on fertilizer exports caused further shortages in the market and accelerated price increases. The restrictions, once placed, are hard to remove, even when prices drop back down. In the long run, restrictions distort the efficiency and effectiveness of markets.

- ***Support the people, not the product.*** Rather than distorting the market, policymakers should support the people in a market-friendly manner. To safeguard smallholder farmers from high fertilizer prices during a crisis, national governments should provide them with "purchasing power support," such as voucher programs that reduce costs to farmers while supporting the private sector. Such support should be linked with global fertilizer prices so that when prices decrease, the support also decreases. Moreover, the support should be *targeted* and *temporary*.

- ***Improve access to financing.*** Higher fertilizer prices mean greater needs for foreign exchange and financing for fertilizer imports and marketing, especially in low-income countries. National governments and development partners should join hands to increase financial liquidity in the markets to ensure a continuous and adequate supply of fertilizers. They should develop fertilizer import funds and risk-sharing funds to support fertilizer use in developing countries, especially in Sub-Saharan Africa.

- ***Introduce or develop better nutrient management technologies.*** Efficiencies of fertilizer use are low, ranging from 30% to 45%, and energy use in fertilizer production is high. High fertilizer prices offer opportunities for spreading existing technologies such as UDP, which improves nutrient uptake and reduces nitrogen losses by about 40% while increasing yields by 20% to 25%. High prices should be an incentive for policymakers to support the development of a new generation of energy- and nutrient-efficient fertilizer products.

- ***Develop indigenous resources for fertilizer production***. The low fertilizer prices of the 1990s offered little incentive for investment in new fertilizer production facilities in Sub-Saharan Africa. Also, many existing fertilizer plants operated at less than optimal capacity. Today's high fertilizer prices offer opportunities for investing in both existing and new fertilizer plants to use indigenous resources such as natural gas and phosphate rock and increase the local supply of fertilizers. Such investments should be made only if economically viable. But countries should not use the fertilizer crisis to promote a "fertilizer self-sufficiency syndrome" per se.

- ***Monitor the market carefully.*** Countries, especially large countries, should carefully monitor both short- and long-term market developments to safeguard against shortages. When feasible, long-term investments in fertilizer production capacity should be made. Large dominant buyers who can influence market prices should consider developing a system to monitor available in-country stocks and ensure their adequate and timely replenishment before main cropping seasons begin. They should develop better systems of estimating global and regional supply and demand balances on a quarterly basis and disseminating that information regularly.

Improving Resource Efficiency

— Asia —

UDP in Bangladesh

Bangladesh: UDP Spreads Widely and Rapidly

Irrigated rice is the lifeblood of small and greatly overpopulated Bangladesh. High fertilizer prices in 2008 were particularly costly because the government subsidizes fertilizer.

Ironically, most farmers who grow irrigated rice—in Bangladesh and elsewhere—waste two of every three bags of urea fertilizer. Why? Because most farmers broadcast urea into the paddy water. Two-thirds of the product's nitrogen is lost to the air as greenhouse gases or becomes groundwater pollutants.

IFDC pioneered the development of UDP—a technology that reduces nitrogen losses significantly—and introduced it to Bangladesh, with funding from the United States Agency for International Development (USAID). UDP, the insertion of large urea briquettes into the rice root zone after transplanting, reduces urea use by 40% while increasing crop yields by at least 20%.

By 2008/09, IFDC and the Bangladesh Department of Agricultural Extension (DAE) had spread UDP technology to 500,000 ha of riceland. That increased rice production by 268,000 mt. Farmers who adopted UDP had net returns of $188/ha more than farmers who broadcast urea.

UDP reduced Bangladesh's urea imports by 50,000 mt in 2009 alone, saving the nation almost $22 million in fertilizer imports and $14 million in government subsidies. UDP generated an additional 9.5 person-days of labor per hectare—almost 4.6 million additional days of labor. More importantly, the additional rice has made 1.5 million more Bangladeshis food-secure.

In 2009 the Bangladesh Government, with IFDC assistance, began expanding UDP technology to about 3 million farm families on 1.5 million ha. USAID and the United States Department of Agriculture (USDA) funded the expansion.

Rice production is expected to increase by almost 1 million mt by 2011, ensuring food security for an additional 4.2 million Bangladeshis.

The UDP technology not only improves farmer productivity and income, but the need for urea briquettes creates employment. IFDC engineers have developed a simple machine to mold prilled urea into 2.7-gram briquettes or 1.8-gram briquettes. Helping establish village-level businesses to manufacture and distribute briquette-making machines is part of the IFDC program.

By 2008, more than 2,000 of the machines were in use across Bangladesh. By March 2009, local entrepreneurs, including some farmers, had bought an additional 400 new machines and were producing urea briquettes.

UDP Brought to Cyclone Sidr Victims

The super cyclone Sidr ravaged Bangladesh in late 2007, killing thousands—and destroying 659,000 ha of crops. Damage in 12 districts accounted for 86% of all losses.

The loss of *aman* (wet season) rice accounted for 63% of the estimated 1.23 million mt of losses in potential production of all crops. Other crops that were lost due to the cyclone include pulses, vegetables, and spices.

In Sidr's wake, IFDC, in collaboration with the DAE, initiated the Improved Livelihood for Sidr-Affected Rice Farmers (ILSAFARM) project to improve livelihood opportunities for the most severely affected farmers. UDP technology is the centerpiece of the IFDC project, which works to improve crop yields with less expenditure on costly inputs. With funding from USAID, ILSAFARM will directly benefit 280,000 farm families over the 2-year life of the project. ILSAFARM is also leveraging resources of various stakeholders, including DAE, the Government of Bangladesh, and the private sector.

The project was officially launched on April 25, 2009, in Barisal, Bangladesh. In attendance were the Honorable Minister of Agriculture, Matia Chowdhury; the U.S. Ambassador, James Moriarty; USAID Mission Director, Denise Rollins; the Secretary of Agriculture, C.Q.K. Mustaq Ahmed; and other key Government of Bangladesh and USAID officials.

ILSAFARM introduces technology through a market-oriented approach that involves both public and private sector stakeholders. The project demonstrates the profitability of UDP and balanced fertilizer use and builds commercial support systems to ensure long-term productivity increases in the rice value chain.

Within the first 4 months of implementation, IFDC has established more than 175 farm-level demonstration plots for UDP technology. More than 43,000 farmers have received training through ILSAFARM training programs. Also, a strategic promotional campaign has been launched that includes the use of billboards and roadside promotion signs and dissemination of 55,000 technical leaflets. IFDC has initiated the establishment of a small micro-enterprise supply system with 42 briquette machines now in operation to meet farmer demand for the urea supergranules. As a result of the initial project efforts, more than 46,000 farmers in the Sidr-affected area have initiated the use of UDP technology.

Women farmers gather in the Mahilara village of Gournadi Upazila for the ILSAFARM launching workshop April 25, 2009.

Through ILSAFARM, 42 new urea briquette manufacturers started production. Eight machines are owned by women entrepreneurs. “ILSAFARM will bring enormous benefits to Sidr-affected farmers—particularly to women farmers or women who are actively involved in farm activities,” says Ishrat Jahan, IFDC Team Leader in Bangladesh. “Increased rice production will improve their income and thus, their quality of life.”

UDP Trials in India

IFDC scientists examined the effect of deep placement of urea-DAP-KCl briquettes compared with broadcast incorporation of NPK on transplanted rice yields and floodwater nutrient loads in the greenhouse at headquarters and in eastern India during monsoon seasons.

Significantly higher grain and straw yields, total N, P, and K uptake, and N and P use efficiencies were observed with deep placement in both the greenhouse and field studies. Similar or even higher grain yields were obtained with 40 kg/ha less fertilizer N with deep placement than with broadcast application.

The farmers’ time/labor costs were reduced and fertilizer management was also simplified because all N, NP, or NPK requirements for the entire crop season were made by one-time deep placement. In addition, farmers reported reduced labor for weeding because less of the UDP fertilizer reached weeds, so fewer grew. This approach was extended to upland crops including tomatoes, cabbage, rice, and maize.

Even though the UDP trials were successful in India, the technology has not been popularized because UDP briquettes are not yet readily available.

UDP in Cambodia and Vietnam

UDP was introduced in Vietnam and Cambodia in 2007. Several thousand farmers now use UDP in Vietnam. The country has at least four briquette machine manufacturers, plus briquette producers and retailers. Several hundred farmers in Cambodia are using UDP.

UDP Moves to Afghanistan

FARMS: Food for Agricultural Revitalization and Market Systems

UDP in Rice Using Conventional and Zero Tillage

Broadcast urea and UDP were tested with transplanted irrigated rice for the first time in Afghanistan from June to November 2008 through IFDC's FARMS project at the Nangarhar Provincial Research Station. In addition to testing fertilizer placement, the introductory trials also assessed the role of tillage (conventional vs. zero tillage) and varietal performance. The varieties tested included Kunduz, a local traditional rice variety, and Basmati 385, an improved variety, developed in the Punjab region of Pakistan.

Preliminary results indicate that rice fertilized by UDP produced greater yields than rice fertilized by broadcasting, irrespective of tillage or variety used. While these initial results are promising, more work is needed to determine the individual components (e.g., fertilizer rates, tillage, high yielding varieties) of the UDP-based technology package that provides maximum economic yield for the Afghan farmer.

UDP trials in Nangarhar Province, Afghanistan.

IFDC is implementing FARMS in collaboration with Afghanistan's Ministry of Agriculture, Irrigation, and Livestock (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.

Drip Irrigation and UDP with NPK for Vegetables

Both water and fertilizer are scarce and expensive—but essential for increasing agricultural production in arid and impoverished Afghanistan. That's why the IFDC FARMS project has initiated on-farm research combining two resource-saving technologies: drip irrigation systems to increase the efficiency of water use, and UDP for improved fertilizer efficiency.

"Although UDP's previous successes have been with irrigated rice, FARMS is testing it with vegetables in Afghanistan," says Dr. Deborah Hellums, IFDC Soil Scientist and Field Projects Coordinator. "And rather than deep placement of only urea briquettes, the FARMS project is using briquettes that combine all three essential plant nutrients: N, P, and K, or nitrogen, phosphorus, and potassium."

Drip irrigation minimizes evaporation losses by delivering water directly to a crop's root zone, but its adoption depends on accessible equipment at affordable prices.

"Fortunately, farmers in several developing countries now use inexpensive drip irrigation equipment such as the Chapin bucket system that IFDC is utilizing in Afghanistan," Hellums says.

Previous greenhouse research at IFDC Headquarters had shown significant benefits from combining drip irrigation and urea briquettes. Further greenhouse trials in 2007 and 2008 showed that deep-placed briquettes containing NPK, applied with drip irrigation, produced significantly more marketable fruit than did fertigation (soluble NPK added to irrigation water) or drip irrigation combined with deep-placed granular NPK.

These findings motivated the FARMS project to test and demonstrate UDP combined with drip irrigation on tomato and cabbage crops on raised beds with plastic mulch in six Afghan provinces.

Results indicate that this combination improves both water and nutrient use efficiencies and significantly increases yields.

"The costs to initiate drip irrigation-UDP systems are higher, but the investments seem worthwhile because they reduce water and labor requirements compared with flood and furrow irrigation systems," Hellums says. "The combined system also reduces weed competition and nutrient losses but most importantly increases crop production."

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

A research and demonstration trial evaluating drip irrigation with plastic mulch and deep placement of urea briquettes on tomatoes at the Qargha Research Station in Kabul, Afghanistan.

Afghanistan Water, Agriculture and Technology Transfer (AWATT)

The AWATT project is a funded by USAID and implemented by a New Mexico State University-led consortium, which includes IFDC. IFDC's role is to implement an activity entitled *Employing Technology in Resource Conservation and Risk Management in Afghanistan Agriculture*. In the first 3 months of implementation, 20 farm technology demonstration sites have been established to demonstrate the benefits of employing drip irrigation technology, plastic mulch, and improved fertilizer management (including fertigation) in high-value crops.

— Sub-Saharan Africa —

UDP Trials in Rwanda

In 2008/09 IFDC introduced UDP to the Great Lakes Region of Central Africa, the continent's poorest and most densely populated region. UDP training programs were held for 25 agronomists from Rwanda, Burundi, and DRC. Four UDP field trials of transplanted rice were established on farmers' fields in Rwanda: two each in Rwamagana, Eastern Province, and in Gikonko, Southern Province. IFDC's partner in the initiative is ICM Agribusiness.

"We selected trial sites based on socioeconomic and agroclimatic conditions," says Dr. Upendra Singh, IFDC Senior Scientist—Systems Modeling (Soil Fertility). "Soils of the trial sites have low percolation rates, which help decrease leaching losses, and water management is good. Also, adequate labor is available in the trial areas."

In November 2008 Singh conducted UDP training programs in Rwamagana for 10 Rwandan agronomists from the Eastern Province, along with two from Burundi and two from DRC. He also trained 11 Rwandan agronomists in the Southern Province. All trainees were involved with cooperatives where rice is grown.

In March, 15 farmers observed differences in plots where urea was applied using UDP versus broadcast urea at a farmers' field day in Rwamagana.

Mr. Joseph, who farms the land where the trials were conducted, personally explained to other farmers how to use the urea briquettes and the benefits he was experiencing with UDP.

"Many local farmers, including friends of Mr. Joseph, began using UDP in July 2009, when the next cropping season began," Singh says.

UDP Trials in Other African Countries

IFDC is now working with African scientists to test UDP at agricultural experiment and demonstration sites in six other countries of Sub-Saharan Africa: Madagascar, Malawi, Mali, Nigeria, Senegal, and Togo.

Twenty-six UDP training courses or demonstration days have been held in Madagascar, Mali, and Senegal, during which 817 farmers and almost 100 extension agents, scientists, and students were trained in the technology.

UDP testing areas in those three countries follow:

- Madagascar—UDP trials are being conducted in Ankazobe and Antsirabe in rice irrigation schemes that serve 68,000 ha.
- Mali—UDP trials in Niono and Mopti in a rice irrigation scheme that serves 80,000 ha.
- Senegal—UDP trials in Podor, Matam, Lake Alaotra, and Marovoay in an irrigation scheme that serves 145,000 ha.

UDP Testing Begins in Guyana

UDP was introduced in the South American nation of Guyana in May/June 2009 when the Caribbean Agricultural Research and Development Institute (CARDI) of Guyana's Ministry of Agriculture and IFDC began initiating two field trials over two seasons.

UDP trials being established in fields of direct-seeded rice by CARDI and the Guyana Rice Development Board.

Rice generates 14% of Guyana's foreign exports and 11% of its foreign exchange earnings, CARDI reports. An average of 47,000 ha of rice is planted annually. Guyanese rice farmers use about 22,200 mt of urea annually at a cost of $13 million. Average rice yields are 4 mt/ha.

According to CARDI, if the UDP technology is only half as successful as reported in Asia, Guyana will save $2.6 million in urea imports annually and increase rice production by 22,090 mt at a value of $4.2 million. The capital cost would be only $0.5 million if Guyana's entire rice industry were to adopt UDP.

"Most rice in Guyana is direct-seeded, so we're adapting the technology," Singh says. Although UDP has been proven successful with transplanted rice in Bangladesh, Cambodia, and Vietnam, this will be the first test of UDP with direct-seeded rice.

Exploiting Fertilizer Raw Material Resources in Africa to Promote Local Production

In 2009 IFDC completed field assessments of existing fertilizer production facilities and the fertilizer raw material resources of countries in the Southern African Development Community (SADC). The purpose was to evaluate how effective today's facilities are for fertilizer production and to determine the economic and technical viability of using local facilities to exploit existing raw resources.

A phosphate mine in Togo.

In the early 2000s, IFDC initiated a study of the availability of fertilizer resources across Africa. To stimulate local fertilizer production, IFDC published its findings in the 435-page reference book *Fertilizer Raw Material Resources of Africa*, authored by Steven J. Van Kauwenbergh, IFDC Principal Scientist and Program Leader – Fertilizer Technology Program.

The book documents nitrogen, phosphate, potassium, and sulfur resources across Africa.

For example, six African countries have about 50% of the global reserve base of phosphate rock, according to some estimates. Current and projected high fertilizer prices have stimulated new interest in Africa's natural gas for nitrogen fertilizer production as well as the continent's phosphate and potassium resources.

"Peaking phosphate fertilizer prices in 2008 have led to exploration and development of phosphate rock resources in South America, Eurasia, Australia, and particularly, in Africa," Van Kauwenbergh says.

IFDC is now promoting use of the most promising deposits to produce fertilizer for poor farmers across Africa.

Only Urea Plant in Sub-Saharan Africa Reopens in Nigeria as *Notore*

The only urea plant in Sub-Saharan Africa, the previously defunct National Fertilizer Company of Nigeria (NAFCON), reopened and resumed production as Notore Chemical Industries, Ltd., in January. The plant, near the Niger Delta town of Onne on Nigeria's southern coast, will manufacture two forms of nitrogen fertilizer: urea and anhydrous ammonia.

IFDC played a role in transforming NAFCON to Notore (which means "genesis" in local dialects). In 2004, Jorge Polo, IFDC Senior Technical Specialist, served on a mission to study how Nigeria could better meet its need for nitrogen fertilizer. The mission was sponsored by USAID.

Nigeria's NAFCON plant, one of the world's largest urea facilities, closed in 1996 and reopened in January, after extensive refurbishment, as Notore.

"We considered three possibilities: restoring and restarting the NAFCON facility, building a new plant, or moving a used plant to Nigeria," Polo recalls. "We concluded that the most efficient way to reestablish urea production in Nigeria was to privatize, rehabilitate, and reopen NAFCON and then consider building new units to meet future needs."

The government-owned NAFCON plant was one of the world's largest urea facilities when built in 1988. But NAFCON closed in 1996. It was purchased by Notore in 2005 and a multi-million dollar refurbishment program began. Notore is owned by a consortium of Nigerian private investors and both local and foreign institutional investors.

"Notore's acquisition of NAFCON was a result of former Nigerian President Olusegun Obasanjo's initiative to privatize government-owned businesses and focus on developing the nation's agricultural sector," says Onajite Okoloko, Notore Managing Director and CEO.

"The Niger Delta has abundant natural gas, but about 60% is 'flared,' or burned off and wasted," Okoloko says. Natural gas, a byproduct of the oil drilling industry, is essential for manufacturing nitrogen fertilizer. Onne is near the Atlantic Ocean, which facilitates both the import of natural gas and other raw materials and the export of fertilizer to other African countries.

The Nigerian National Petroleum Corporation signed a 20-year contract with Notore to supply natural gas to the new plant, according to Dr. Amit Roy, IFDC President and CEO.

"Notore's current production capacity is 1,000 metric tons per day of ammonia and 1,500 metric tons per day of urea," says Dr. Maria Wanzala, IFDC Economist and Representative to the Secretariat of the New Partnership for Africa's Development (NEPAD), based in Johannesburg, South Africa. "Estimates are that the plant may produce as much as 160,000 metric tons per year of urea and 500,000 metric tons per year of NPK."

More than 60% of the annual urea (100,000 mt) and NPK (320,000 mt) production will be sold in Nigeria and the rest to fertilizer-deficient countries of West and Central Africa. "To ensure effective distribution, Notore is initially establishing a network of 70 major dealers in 16 states in preparation for the current production season," says Scott Wallace, IFDC Nigeria Country Representative. "In addition, Notore wants to partner with the Nigerian Government, IFDC, and key states to roll out a targeted fertilizer voucher program this year," Wallace says.

The distribution network includes more than 400 trucks dedicated to transporting fertilizer from the plant to dealers. Notore is developing similar networks in other countries that import its fertilizer.

Within 5 years, NOTORE plans to install additional urea production capacity.

"The African Green Revolution has indeed begun," Okoloko said in a Jan. 8 Reuters article. "Nigeria has once again joined the elite league of industrialized nations that produce fertilizer."

Lake Kivu on Rwanda-DRC Border
A Potential Source of Nitrogen Fertilizers for Sub-Saharan Africa?

The deep and dark blue waters of Lake Kivu, on the border of Rwanda and the DRC, contain huge amounts of dissolved gases—mostly carbon dioxide and methane—that increase in concentration with the lake's depth.

Methane is the desired feedstock for the production of nitrogen fertilizers. Fertilizers are particularly expensive in Rwanda and neighboring countries, partly because almost all are imported through ports in Kenya and Tanzania. Exploiting indigenous resources of landlocked countries can make fertilizer cheaper for smallholder farmers.

IFDC has proposed, and the Rwandan Government has agreed, that production of nitrogen fertilizer from gases of Lake Kivu should be considered.

Preliminary technical assessment confirms the feasibility of producing ammonia and urea for Rwanda and neighboring countries from Lake Kivu gases. But before deciding on this option, further study is needed on potential markets, economics of production, and environmental impacts.

Efficiency of Fertilizer Use

Testing of New and Modified Fertilizer Products

Improving the efficiency of fertilizer use remains a major focus of IFDC's laboratory, pilot plant, greenhouse, and field research. Several new and modified fertilizer products were tested in greenhouses and laboratories in 2008 to compare their nitrogen delivery and potential environmental impacts with conventional fertilizers such as urea and ammonium nitrate. Agronomic efficiency and environmental effects of nitrogen fertilizers are closely associated with:

- Transformation of the fertilizer products into various forms of nitrogen in the soil.
- Loss of volatile nitrogen forms to the atmosphere.
- Movement of water-soluble forms of nitrogen across the soil profile.

These effects were studied in incubation, volatilization, and leaching experiments using a wide range of soils. The effect of temperature on N release and transformation was studied at 15, 20, 25, and 30 C.

Some modified products had 35%–50% less volatilization and 15%–35% less leaching loss than urea. Greenhouse results with transplanted rice showed 56% efficiency of nitrogen used versus 35% with urea.

Vitamin A Deficiencies and Malnutrition

About 250 million preschool children in Sub-Saharan Africa suffer from vitamin A deficiency; many go blind. According to a study conducted by the International Food Policy Research Institute (IFPRI), vitamin A deficiencies reduce a child's ability to resist infection (http://www.ifpri.org/2020/dp/dp37/2020dp37.pdf). This contributes to the deaths of more than a half a million African children annually. The IFPRI study states that 200 million people in Africa are undernourished and their numbers have increased by 50% since the late 1960s. Lack of adequate nutrition is the major risk factor underlying more than 29% of all deaths in Africa (some 2.9 million deaths annually). Malnutrition is increasing at the highest rate among the urban poor.

Role of Vegetables in Human Nutrition

Vegetables increase diversity in human diets and add minerals and vitamins, improving nutrition and health by reducing micronutrient deficiencies, particularly of iron, zinc, and vitamin A. The growing awareness of health issues is increasing both demand for and value of vegetables, especially in urban areas.

High-value vegetable crops also increase and diversify farm income, create employment in peripheral and support industries, and stimulate agro-industrial innovation in the production of value-added vegetable products. Vegetables offer opportunities to diversify crops in cereal-based systems and create new economic opportunities for peri-urban areas with nutrient-deficient soils. The value:cost ratios for vegetables, even after home consumption, are 2.5:1 to 4.5:1.

Although fertilizer use in Sub-Saharan Africa is the world's lowest (about 8 kg/ha), vegetable farmers apply three to eight times more fertilizer than farmers apply to other

Vaughn Henry, Senior Technician – Greenhouse Services, examines transplanted rice at headquarters' greenhouse.

Vaughn Henry, left, and Mike Thompson, Senior Visitor Relations Officer, check the effects of volatilization experiments at headquarters.

Children everywhere need a diverse diet rich in vitamins and minerals.

food crops because of the high demand and high market value of vegetables in cities.

Innovative Fertilizers for Peri-Urban Farmers in Sub-Saharan Africa

IFDC initiated the "Innovative Fertilizers for Peri-Urban Farmers in Sub-Saharan Africa" project in February 2009 to increase vegetable production and quality in peri-urban farming systems. Increases in production and quality can be achieved through more efficient use of fertilizers and water, use of improved vegetable varieties, human capacity development, value chain management, and development of a strong market information system.

The project's first phase will focus on increasing profitability through improved efficiency of resource use. Research sites are urban centers with large populations and high market demand for vegetables: Bujumbura, Burundi; Accra, Ghana; and Kigali, Rwanda. The calorie, protein, and mineral intake in those cities remains below the minimal threshold, and demand for vegetables is increasing.

Bujumbura has an urban population of about 403,000; Kigali, more than 1 million; and Accra, 2.9 million (projected to reach 6 million by 2015). Thus, these urban areas have a tremendous need for peri-urban agriculture to meet vegetable demand.

Agri-input dealers, farmer organizations, and extension services are participating in the project.

IFDC expects extension services to play a particularly important role in the follow-up phase, which will emphasize sharing of results through on-farm demonstrations.

Research sites in Kigali and Bujumbura are in marshlands and flats. Crop intensification in such areas should ease pressures on cultivating steep and highly erosional hillsides.

Market scene in Rwanda.

Marshland agriculture in Rwanda.

Cultivation on slopes exceeds 45% in Burundi.

IFDC Develops *FertTrade:*

A New Software to Help Farmers Reduce Nitrogen Losses Could Save $4.5 billion in Fertilizer Costs

Demonstrating IFDC's new fertilizer trade model, FertTrade, are Drs. Carlos Baanante (left) and Oumou Camara (right), IFDC Economists. FertTrade will help African farmers and agro-dealers access much-needed market information on N, P, and K fertilizers.

"Increasing the efficiency of nitrogen fertilizers could reduce worldwide nitrogen losses by about 9.3 million metric tons by 2025—a saving of about $10.1 billion in that year," says Dr. Carlos Baanante, IFDC Economist and leader in FertTrade's development. "That achievement in technology development and transfer would reduce farmers' expenditures for nitrogen fertilizer by about $4.5 billion annually, adding significantly to the incomes of millions of cereal farmers in developing countries."

FertTrade is a new analytical software tool that IFDC economists have developed to forecast and evaluate changes and trends in the global demand, production, and trade of N, P, and K fertilizer nutrients.

IFDC is using the FertTrade model to forecast the potential impact of developing and adopting improved fertilizer N technologies that will increase the efficiency of nitrogen fertilizer applied to cereals from today's average of 40% efficiency to 60% or higher.

"The fertilizer trade model can evaluate the impact of a range of 'what if' scenarios affecting global markets for N, P, and K fertilizer nutrients through 2025," Baanante says.

"Today's uncertainty about agriculture's capacity to keep pace with rapidly changing demand makes forecasting models—which link such changes with demand for fertilizers—valuable tools for short- and long-term planning of fertilizer production, distribution, and marketing," Baanante observed. "No other trade model can predict fertilizer market trends like FertTrade does."

IFDC will use FertTrade to improve decision-making on policy changes and technology development and transfer to enhance the performance of fertilizer and agricultural sectors globally, particularly in developing countries.

"Use of FertTrade can produce information that will facilitate the efficient trade of 30% to 40% of the fertilizer nutrients produced worldwide, and prevent or minimize shortages and price spikes that may negatively impact fertilizer use and agricultural production," says Dr. Oumou Camara, IFDC Economist.

"Fertilizer demand is derived from, and depends on, demand for agricultural products—food, feed, fiber, and now biofuel," Camara says. "FertTrade analyzes factors that affect the demand, supply, and trade of agricultural products—which also affect and determine changes in fertilizer demand."

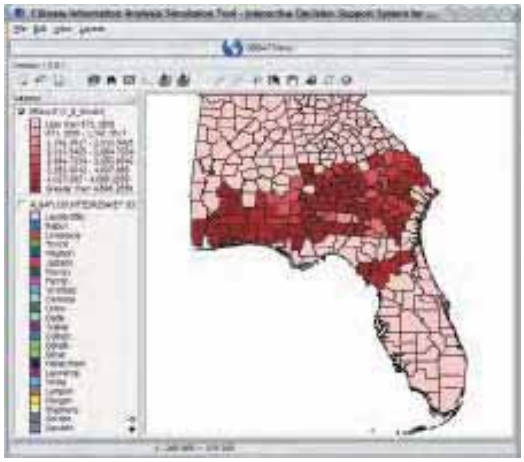
Such factors include national populations and incomes, technological advances in agricultural and fertilizer sectors, climate change, and the demand for biofuels.

IFDC Scientists Develop New Regional Crop Modeling Tool

The assessment and management of agricultural risk centers on two main sources of annual variability: the weather and the cost of agricultural inputs and outputs. To address and quantify these risks, the Climate Information Analysis Simulation Tool was developed by IFDC scientists, Dr. Upendra Singh, Senior Scientist – Systems Modeling (Soil Fertility), and Dr. Paul Wilkens, Scientist – Programmer.

This tool is a fully functional Geographic Information System (GIS) linked with the Cropping System Model in the Decision Support System for Agrotechnology Transfer (DSSAT). Integration of climate and geospatial soil databases allows a wide range of crop management options to be simulated and analyzed. Together with a seasonal analysis tool, crop management can be optimized based on both price/cost structures and climate variability.

With the addition of phosphorus and potassium dynamic modules, this flexible tool has been used for testing cropping system management in many at-risk cropping areas around the



Example of how the crop modeling software works—peanut yield in the southeast United States.

Flavia Rey de Castro, IFDC Associate GIS Specialist, front row, second from right, and Dr. Paul Wilkens, IFDC Scientist – Programmer, back row, third from left, were presenters at the Near East North Africa workshop in Damascus, Syria, in February 2009.

world. In the last year, this system has been used to optimize crop management with the goal of minimizing risk and maximizing profits in India, the southeast United States, and on the continent of Africa, particularly in Morocco and Benin.

The demand for modeling workshops around the world continues to increase as research and other organizations turn to systems analysis to improve nutrient use efficiency and to minimize risk. Many researchers are focusing on the use of crop models to quantify impacts and develop mitigation strategies based on climate variability and climate change.

IFDC researchers participated in several workshops to train scientists in crop modeling, including:

- DSSAT workshop in Griffin, Georgia, in May 2008.
- ISFM workshop in Accra, Ghana, in October 2008.
- Near East North Africa project workshop in Damascus, Syria, in February 2009.
- Crop modeling/climate change workshop at Universiti Kebangsaan Malaysia in April 2009.
- DSS/ISFM workshop in Ouagadougou, Burkina Faso, in July 2009.

Dr. Paul Wilkens, second row, first from left, was a presenter at the Crop Modeling/Climate Change workshop at Universiti Kebangsaan Malaysia in April 2009.

Agrometeorologist Raji Reddy Visits IFDC, Validates Decision Support System for Rice and Maize

Visit Strengthens IFDC Cooperation with Indian Scientists

Visiting scientist Dr. Raji Reddy of Hyderabad, Andhra Pradesh State, India, spent 1 month at IFDC headquarters working with Drs. Upendra Singh, Paul Wilkens, Joaquin Sanabria, and Ms. Flavia Rey de Castro. Reddy is Principal Scientist (Agrometeorology) at the Agricultural Research Institute, Acharya N.G. Ranga Agricultural University (ANGRAU) in Hyderabad.

Reddy specializes in agrometeorological research/resource characterization, crop weather modeling, remote sensing, drought studies, and rice production using less water. He has also studied weather-based forecasts of animal diseases for the World Bank's National Agricultural Technology Project.

The visit will strengthen cooperation among IFDC, ANGRAU, Nagarjuna Fertilizers and Chemicals Ltd., and other agencies.

"One purpose of my visit was to validate the model of DSSAT for rice and maize and its application in risk analysis under various climate change scenarios," Reddy said.

Dr. Raji Reddy (left) talks to Neal Isbell about his cotton crop at Isbell Farms, near Cherokee, Alabama.

DSSAT software integrates the effects of soil, crop phenotype, weather, and technology options into standard formats. It helps researchers, extension workers, and farmers validate crop model results and compare simulated outcomes with observed results. IFDC scientists were part of a collaborative group that developed the DSSAT software in 1993. DSSAT has been used in more than 100 countries.

At IFDC, Reddy tested the validity of a MarkSim weather generator for use in Andhra Pradesh. MarkSim computer software simulates weather data for crop modeling and risk assessment. It is especially useful in the tropics and tailored for DSSAT users.

IFDC arranged for Reddy to visit renowned climatologist Dr. John Christy at the University of Alabama, Huntsville, and Dr. Gerrit Hoogenboom, Professor of Biological and Agricultural Engineering at the University of Georgia, Griffin. He also visited Alabama A&M University, Huntsville, and the University of North Alabama, Florence.

India grows more than 9 million ha of cotton annually, so IFDC arranged a visit to Isbell Farms near Cherokee, Alabama. The Isbell family grows cotton and corn with cutting-edge technology and farm equipment, including the latest satellite technology. Farmers from across the southeastern United States attended demonstrations of precision agriculture in July 2008 at the Isbell farm (http://www.timesdaily.com/article/20080711/NEWS/807110321/1011).

India is the world's second-largest rice producer after China. Reddy learned of the success of UDP in rice in Bangladesh and plans to explore its use in India.

"The early UDP trials in India were successful, but due to non-availability of briquettes, the technology was not popularized," Reddy said. "But India should focus more on this technology because more than 70% of the urea that farmers apply is wasted."

Wilkens says, "Dr. Reddy's visit gave us an opportunity to expand our knowledge of climate variability in Andhra Pradesh and to develop stronger ties with scientific colleagues in India. Proposals were developed for increased collaboration, including an international workshop in Hyderabad tentatively set for October 2009."

Promoting Agricultural Intensification

— Sub-Saharan Africa —

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

Since 2006, the CATALIST project has worked to increase social and environmental stability through agricultural intensification in Central Africa's Great Lakes Region. The area comprises Burundi, eastern DRC, Rwanda, western Tanzania, and southern Uganda.

The project helps farmers use mineral fertilizer and complementary inputs in an integrated and optimal way to ensure environmental and economic sustainability of land use. CATALIST works to improve the efficiency and effectiveness of agricultural input markets, promote mineral fertilizer use, and improve farmers' access to credit and market information. CATALIST is also increasing and improving market opportunities for agricultural products and promoting value chain development.

Access to Credit

CATALIST is helping establish a simplified system of warehouse receipts, with the participation of at least five banks and/or microfinance institutions and 4,000 producers. Farmers will have access to credit based on their stored crops. Having the guarantee of the crop will reduce the risk to banks. Also, the orderly sale of warehouse inventory will prevent prices from collapsing at harvest.

Women transporting clods of earth for slope terracing.

Agroforestry and Rural Road Rehabilitation

Helpage, a CATALIST partner and nongovernmental organization (NGO) in Rwanda, has grown and distributed several million seedlings and helped farmers establish thousands of hectares of agroforestry fields in the CATALIST region. CATALIST and Helpage are rehabilitating about 135 km of rural roads in Burundi, the Kivu provinces of eastern DRC, and northern Rwanda. This activity created local jobs and injected about €550,000 (US $741,615) into poor rural communities. One rehabilitated road in Kivu will lead to 800 square kilometers of land that has barely been used due to lack of access. In Burundi, the number of businesses located on rehabilitated roads increased by 55%, and vehicle traffic increased by 25%.

SEW: Sustainable Energy Production Through Woodlots and Agroforestry in the Albertine Rift

The SEW component of CATALIST works to achieve sustainable energy production through reforestation and development of the wood fuel and charcoal value chains. The goal is to decrease competition between energy and agricultural production for land use by increasing wood production, agricultural productivity, and incomes.

Through SEW, IFDC's CATALIST project will ensure that tree planting and land management are supported by agricultural intensification.

SEW will work to preserve environmental and biodiversity hotspots by reducing forest clearance. Social stability will be enhanced by allowing farm families to access fuel supplies at the farm level. Income and employment will be generated in rural areas through labor-intensive works, increased agricultural production, and market integration. The area under agroforestry will be increased and soil erosion will be reduced.

Initial project activities include adopting a 6-month workplan and gathering and analyzing data to include in an inception report.

Round terraced hill in the CATALIST region.

The 3-year program began in early 2009. SEW is funded by the Royal Netherlands Embassy in Rwanda and implemented by IFDC in Burundi, the Kivu provinces of eastern DRC, and Rwanda.

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

1000s+: From Thousands to Millions, West Africa

The 1000s+ project is increasing agricultural productivity and economic growth for more than 600,000 farmers in 220,000 households by stimulating trade, developing input and output markets, and improving soil fertility in Benin, Burkina Faso, Ghana, Mali, Niger, Nigeria, and Togo.

1000s+ links farmers to markets through expansion of the CASE approach, which promotes agribusiness cluster formation, commodity chain development, and strengthening of public and private institutions' abilities to enable trade and agribusiness.

"The use of improved seeds and fertilizer consumption in areas served by 1000s+ have increased by 172%—raising food production by more than 350,000 metric tons of cereal equivalent over the past 2 years," says Wim van Campen, IFDC Chief of Party for the Strategic Alliance for Agricultural Development in Africa (SAADA).

Farmers' revenue on selected crops has risen by 98% in 1000s+ areas. Formal contractual arrangements are increasing. In 2008 more than 250 formal business agreements were signed among the 3,000 producer

Wim van Campen (center) of IFDC's SAADA program visiting an agribusiness cluster on groundnut production and processing, run mainly by women, in Niger. (Photo by Amadou Attikou)

organizations (including 1,660 women's groups). More than 700 business agreements have been signed among 2,300 producer organizations (including 990 women's groups) and more than 1,200 local entrepreneurs. Business volumes of those groups have increased by more than 100% in the past 3 years. Those entrepreneurs have increased their number of employees by 94%.

1000s+ encourages financial intermediation to help secure access to credit for farmers and local entrepreneurs. Two memoranda of understanding have been signed between IFDC and the Banque Régionale de Solidarité in Burkina Faso and Togo to facilitate access to credit for 1000s+ participants.

More than 100 local service providers, with more than 270 contracts, work with 1000s+ in cluster formation and value chain development. These small business owners have received hands-on training to strengthen core competencies.

A key component of 1000s+ is integrated soil fertility management (ISFM), an IFDC approach to improve soil fertility through the combined use of organic fertilizers such as crop residues, composts, and green manures with mineral fertilizers.

"So far, the achievements of 1000s+ have cost less than $35 per farm family," van Campen points out.

1000s+ is sponsored by the Directorate-General for Development Cooperation (DGIS) in the Netherlands and implemented by IFDC.

African Traders and Farmers "Text Message" Business Through TradeNet—Now *Esoko*

African farmers and traders are now using mobile phones to text-message free listings of offers to buy or sell farm produce and inputs through a Web-based market information platform that IFDC helped establish in 2007.

The portal, originally called TradeNet, was fully rebuilt and launched as Esoko (*electronic market* in the Kiswahili language) in June 2009. It can be viewed at www.esokonetworks.com.

"The revitalized platform allows users to use the Internet to post and get real-time prices, offers to sell and buy, and other information," says Dr. Kofi Debrah, IFDC Country Representative in Ghana and Chief of Party of IFDC's Commercial Development of Farmer-Based Organizations (CDFO) project.

"Farmers and traders can access market information at any time in almost any area where Esoko is operational."

Esoko serves 15 West African countries and more than 100 commodities in 537 markets. Esoko and its predecessor, TradeNet, have received more than 5 million "hits."

More than 85% of Africa's population is expected to have mobile phone coverage by 2010, so there is strong potential to scale up this approach to develop flourishing agri-markets across Africa.

TradeNet/Esoko was established as a partnership between BusyLab, a Ghana-based software company, and the USAID-funded IFDC project MISTOWA (Strengthening Regional Networks of Market Information Systems and Trader Organizations in West Africa). MISTOWA has helped generate more than $400 million in intraregional trade and developed 150 Agribusiness Information Points (ABIPs) across West Africa.

AfricaFertilizer.org—A Global Internet Portal Site to Catalyze African Agriculture

IFDC has plans to launch www.AfricaFertilizer.org in 2009. AfricaFertilizer.org is a global Web portal site to disseminate and exchange information necessary for agricultural intensification, including development of fertilizer and commodity markets, across Africa.

The interactive site has search engines and provides for discussions.

"AfricaFertilizer.org will help initiate and fuel the African Green Revolution that the continent needs," says Patrice Annequin, IFDC Market Information Specialist. Annequin provided leadership in establishment of the portal site.

AfricaFertilizer.org will help its ultimate clients—smallholder farmers across Africa—mainly through stakeholders in the development of Africa's agriculture. These include farm organizations, researchers, policymakers, extension specialists, the agri-input industry, the private sector, donors and funding agencies, and the media.

The concept for AfricaFertilizer.org grew out of the Africa Fertilizer Summit held in June 2006 in Abuja, Nigeria. AfricaFertilizer.org was largely developed in Ghana, using African Web designers. The initiative is partly funded by SAADA, a program to develop competitive agricultural systems and viable agri-enterprises.

Joel Dossoumon, Database/Web Officer, IFDC Ghana office, prepares for the launch of www.AfricaFertilizer.org.

Establishment of the Cocoa Abrabopa Association

The project Establishment of the Cocoa Abrabopa Association began in December 2007 to increase incomes and improve livelihoods of resource-poor cocoa farmers in Ghana by strengthening the Cocoa Abrabopa Association (CAA). Project objectives are to help CAA become financially sustainable, build members' business skills and technical knowledge, improve access to agri-inputs, and improve the cocoa quality and environment in Ghana. ("Cocoa Abrabopa" means "cocoa for a better life" in the local language.)

The project is a collaboration among public and private organizations: the CAA, Wienco Ghana Limited, the Cocoa Research Institute of Ghana (CRIG), TechnoServe, and IFDC. Wienco (a Ghana-Dutch agribusiness company) provides agri-inputs. CRIG develops fertilizer recommendations. TechnoServe (a nonprofit company based in the United States) organizes business and management training. IFDC's role is to train farmers in ISFM, assist CRIG in the development of fertilizer recommendations, and coordinate the overall project.

The project is built upon activities that began in 1999, when Wienco and CRIG developed the Abrabopa package, a combination of agri-inputs and farm management practices. The package increased yields from 3.3 bags/acre to 7 bags/acre (from 510 to 1,081 kg/ha) after the first year of testing and to 15 bags/acre (2,317 kg/ha) after the third year.

Taking soil samples in Ghana.

Farmer groups could buy the inputs on credit at no interest and receive technical advice. In 2006, 164 farmer groups (1,441 cocoa farmers) registered to receive the package. Only the groups who repaid their loans could register again the next season. In 2007, 766 groups (6,102 farmers) registered. The CAA was officially registered as an association in 2008.

About 11,000 farmers have now joined the CAA, and 7,000 more are expected to become members during 2009 for a total of 18,000 members.

The project is funded by the Netherlands Embassy in Ghana and Wienco.

Success Stories From Members of the Cocoa Abrabopa Association

Hannah Ebbah with her cocoa crop in Wasa Akropong, Ghana.

"I'm very proud of my business," says cocoa farmer Hannah Ebbah, chairperson and the only female in the *Bo Woho Modin* group ("force yourself" in the local Ghanaian language).

Ebbah has grown cocoa since 1980. She started with 0.81 ha of land and now owns 3.2 ha. Ebbah became a member of the CAA 2 years ago after hearing a radio advertisement.

"Cocoa Abrabopa has been very good for my crop," Ebbah explains. "I used to harvest 6 to 7 bags of cocoa per acre [927 to 1,081 kg/ha]. Now I'm getting as much as 18 bags [2,780 kg/ha]." Ebbah attributes this increase to both the agri-input package and her Abrabopa training.

Ebbah previously bought fertilizers and pesticides in the market but was never taught how to properly use them. Now she knows how and when to apply, and how to safely store, the products. She has also learned how to prune cocoa trees.

Ebbah can now afford to pay school fees and set up an education fund for her two children; she has also bought an insurance policy.

"I've learned to treat cocoa farming as a business," Ebbah says. "Before Abrabopa, I couldn't support my children, but now I'm saving for their future."

Success Stories From Members of the Cocoa Abrabopa Association

Nana Owusi from Samreboi, Ghana

Cocoa farmer Nana Owusi.

"Cocoa Abrabopa is very good for us," says Nana Owusi, chairperson of the *Sika Nti* group (which means "because of money").

Owusi has been a farmer for 11 years. This is his third season with the CAA. Owusi was convinced he should join after learning that he could buy fertilizer on credit.

In the past, Owusi thought he couldn't afford fertilizer, but now he sees how inputs help his crop grow better. In his first two seasons with the association, Owusi harvested 3 bags per acre (463 kg/ha); he now harvests 12 bags (1,853 kg/ha).

Owusi says that the most valuable information he received from CAA was how to be a better businessman. "Before I joined the association, I went to my farm only occasionally, but now I go every day," he says. "I've learned that cocoa farming is like a shop: if you don't open your doors every day, you don't make money."

With his increased yields, Owusi and his wife now have enough money to pay school fees for their six children and are building a new house. They have also bought a taxi that generates more income.

"We now have a bank account and have begun saving money for the future," Owusi says.

Owusi now has no trouble recruiting members to join the Sika Nti group. "The product sells itself," he says. "When people see how our yields have increased, they want to join too."

Cocoa pods in Ghana. Taking soil samples are CAA members and Wilson Dogbe (wearing blue jeans), Cocoa Agronomist for the Abrabopa project.

Cocoa Abrabopa Association Makes Farmers "Part of the Winning Team"

Hundreds of cocoa farmers gathered in Dunkwa, Ghana, on Sept. 18, 2008, to celebrate the success of the CAA. Also represented were agri-input dealers and importers, government officials, partner organizations, and traditional Ghanaian leaders (tribal chiefs, elders, etc.).

Participants at the Abrabopa celebration included agri-input dealers and traditional Ghanaian leaders.

CAA activities began when Wienco Ghana Ltd., Ghana's main agri-input importer, started supplying inputs to cocoa farmers on credit. Since December 2007, the Netherlands' embassy in Ghana has supported CAA through the IFDC-coordinated project Establishment of the Cocoa Abrabopa Association.

"CAA is an intermediary between farmers and partner organizations, and trains members in technical aspects of cocoa," says Manon Dohmen, IFDC Project Coordinator. "The project builds on successful collaboration among public and private organizations."

Farmers wore matching white t-shirts and green caps to the celebration.

Henry Wientjes, founder and former Executive Director of Wienco, said, "Cocoa is not purely business—it's a way of life. We can be enormously powerful if we are well-organized and strengthen our numbers. That requires honesty and discipline. Discipline can improve our lives."

Alex Asante Afrifa, CRIG Soil Scientist, explained that, "Cocoa has been grown here for more than a century by mining nutrient reserves from the forest land, using no fertilizer. Before Abrabopa, production was going down. Farmers were harvesting only 250 to 450 kilograms of dried cocoa per hectare—far less than the potential of 800 kilograms per hectare with the introduction of the cocoa high-tech package including fertilizers."

The project increases cocoa production through farmer adoption of the "Abrabopa package"—cocoa fertilizers, chemicals to control diseases and pests, spraying equipment, extension services, and farm management training. CAA members get their inputs on credit and pay a yearly fee for training in business and product knowledge.

The slogan of the cocoa media campaign, "Be Part of the Winning Team," was prominently posted across Dunkwa during the celebration.

"Isaac Nartey of Assin Fosu is definitely part of the 'Winning Team,'" Dohmen pointed out. Nartey started using the Abrabopa package last year on his 0.8-ha farm. "I harvested 18 bags [a bag = 63 kg] of cocoa, where I formerly got 5 to 7 bags. This year I may reach 25 bags," he said proudly. "I don't need to borrow money from friends anymore and I can regularly pay my children's school fees."

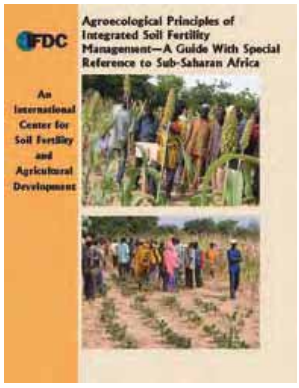
The Abrabopa package has brought significant change to Mary Nyako's 1.2-ha cocoa field. "The main problem was how to get the money to buy inputs," said Nyako, a member of the Ankwagya Farmer Group. "I learned of CAA and the Abrabopa package by radio. I joined CAA and tried the package 2 years ago. My production has risen from 4 to 10, even 15 bags. Now I can take better care of my children and my pocketbook is a little heavier."

Patrick Adompreh, a farmer in the Volta Region, attributes his success to the input package and business training that CAA offers. "The program has taught me to keep production records and treat cocoa farming as a business," he said. Last season, Adompreh harvested 21 bags of cocoa on his 0.8-ha field.

Eliseus Opoku-Boamah, CAA's Executive Secretary, said, "Cocoa production is the most important economic activity of rural Ghana and is one of the largest contributors to Ghana's domestic product. Progress has been significant—but much more remains to be done."

Her Excellency Lidi Remmelzwaal, Ambassador of the Netherlands to Ghana, said, "Cocoa has certainly been an important binding element in Ghana-Netherlands relationships. The Netherlands is the destination of 60% of Ghana's cocoa production. Rotterdam is famous as a 'cocoa port.'

"I hope that in due course, Cocoa Abrabopa will develop as a model for farmer-based organizations—not only in Ghana but across West Africa," Ambassador Remmelzwaal added.



IFDC and TSBF Publish Guide to *Agroecological Principles of ISFM*

A new technical bulletin, *Agroecological Principles of Integrated Soil Fertility Management—A Guide with Special Reference to Sub-Saharan Africa,* was published in 2008 by IFDC and the Tropical Soil Biology and Fertility Institute (TSBF). The ISFM guide was co-written by Dr. Abdoulaye Mando, Program Leader—Natural Resources Management, IFDC North and West Africa Division; Dr. Marco Wopereis, Deputy Director General (Research), Africa Rice Center; and Dr. Bernard Vanlauwe, Senior Scientist/Soil Fertility Specialist, TSBF/International Center for Tropical Agriculture. The bulletin was partly financed by the International Fund for Agricultural Development (IFAD), TSBF, and USAID.

The bulletin gives soil management practitioners basic information on ISFM and its principles, with tools that include specific frameworks for science-based ISFM application at field and farm levels.

"This guide will increase knowledge and adoption of flexible approaches to the development of ISFM technical options to increase productivity and enhance natural resources in Sub-Saharan Africa," says Dr. Amit Roy, IFDC President and CEO.

Improving Market Efficiency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AIMS: Agricultural Input Markets Strengthening Project

In 2006 the USAID mission in Mozambique awarded a grant to IFDC to promote private sector development in the marketing of agricultural inputs (and thus intensify agricultural production) through the 30-month pilot project, AIMS.

AIMS provides incentives, including training and capacity building, to establish and improve open and competitive markets and dealer networks in order to make appropriate technologies—particularly fertilizers—more available to farmers.

IFDC implements AIMS in cooperation with the International Crops Research Institute for the Semi-Arid Tropics, the International Institute of Tropical Agriculture, the Citizens Network for Foreign Affairs (CNFA), and the Mozambique Ministry of Agriculture.

Dealer development and improved farm production technologies are emphasized in Mozambique's Beira and Nacala trade corridors. Agricultural policy issues with regional and national impacts are the focus of AIMS activities in Maputo. The six main program areas are:

- Business and human capital development.
- Association building.
- Support for technology transfer and extension.
- Increased production of improved seeds.
- Improved policy environment and regulatory regime.
- Regional collaboration.

AIMS completed a feasibility study on establishing a large regional stocking fertilizer warehouse near the Port of Beira in 2008 (see box).

At the request of the Ministry of Agriculture, AIMS helped design a pilot program to promote agri-input use through a voucher program to empower farmers to buy inputs through private sector dealers trained by AIMS. Funds were not available to subsidize the inputs in 2008, but efforts are ongoing to initiate the program in mid-2009.

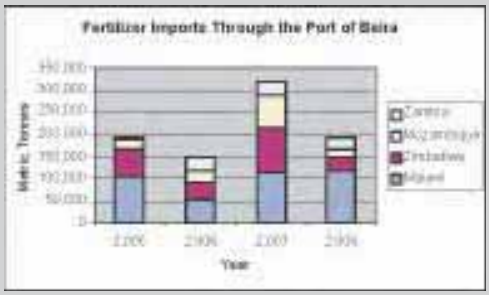
AIMS also works with the Government of Mozambique to develop policies that promote the use of agri-inputs, particularly fertilizers. Policy recommendations include elimination of the 2.5% import tax on fertilizers, removal of restrictions on the re-export of fertilizers, and dredging of the Port of Beira to facilitate the entry of large cargo ships. The Ministry of Agriculture and Ministry of Finance have both agreed to the elimination of the import tax, pending Parliament approval.

AIMS officially ended on November 30, 2008, but continues to operate on funding that had not been spent.

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

IFDC AIMS Program Studies Potential for Regional Fertilizer Warehouse in Beira, Mozambique

As in most of Sub-Saharan Africa, fertilizer consumption in Mozambique is low—less than 8 kg/ha yearly. Ironically, large quantities of fertilizer are routinely imported into the country through the ports of Beira and Nacala—but never reach the Mozambican farmers who urgently need it.



The Port of Beira serves not only Mozambique but also the neighboring countries of Malawi, Zambia, and Zimbabwe. Nevertheless, little of the fertilizer passing through Beira stays in Mozambique. During 2005–08, for example, 46% of the fertilizer was transshipped to Malawi, 28% to Zimbabwe, and 11% to Zambia. Only 15% stayed in Mozambique.

Most of the transshipped fertilizer goes to tobacco and sugarcane plantations.

Over the past 4 years, fertilizer imports through Beira have averaged 212,000 mt/year, ranging from 148,000 mt in 2006 to 318,000 mt in 2007.

IFDC's AIMS project seeks to improve efficiencies in fertilizer distribution and use for the entire region. In 2009, AIMS conducted a feasibility study of building a large warehouse near Beira to consolidate and stock fertilizers in bulk, then forward them to markets in the four countries. The economies of scale would lower procurement costs, speed delivery for dealers, and thus make fertilizer cheaper for farmers.

The study showed that a Beira fertilizer warehouse seems economically feasible. Its success will depend on:

- **Constant dredging of the port's channel to ensure draft of 14–15 meters so large vessels can enter.**
- **More shore equipment such as mobile cranes and machines that can bag 50-kg as well as 1- and 2-mt bags.**
- **Removal of the 2.5% customs duty on imports to facilitate fertilizer movement, both in Mozambique and neighboring countries.**
- **Permission to freely import and re-export fertilizers into and from the holding warehouse.**
- **Restoration of rail links from Beira to Malawi and from Michinji, Malawi, to Chipata, Zambia, to shorten the rail connection from Beira to Zambia.**
- **Freer currency exchange.**

Fertilizer unloaded at the Port of Beira.

Findings of the feasibility study were presented to both the public and private sectors in a 2008 workshop in Maputo. IFDC continues to lead efforts to establish a public-private partnership that will open a port facility before the 2009/10 cropping season.

MIM: Maize Intensification in Mozambique

The Maize Intensification in Mozambique (MIM) project was initiated in 2008 to help Mozambican smallholder farmers intensify maize production, primarily through increased fertilizer use. MIM seeks to strengthen the entire value chain of maize production by linking farmers with agri-input suppliers and grain buyers, as well as building linkages with NGOs, farmer organizations, and agricultural extension services.

The goal of MIM is to help farmers evolve from subsistence to commercial agriculture.

The first MIM field activities were initiated with the planting of eight field demonstrations in November and December of the 2008/09 maize cropping season. The demonstrations are in high-potential farming areas and clusters in Manica and Sofala provinces in central Mozambique and in the northern provinces of Nampula and Zambezia. Smallholder farmers in these areas typically plant farm-saved seeds and use no fertilizer or crop protection products (CPPs). Yields are less than 1 mt/ha.

Improved open-pollinated and hybrid maize varieties were used on both fertilized and non-fertilized plots. Fertilization included both basal application of NPK (12-24-12) and topdressing with urea. The need for sulfur has not been determined in these areas, so NPK was applied with and without sulfur.

In March and April 2009 field days were held in each cluster area to demonstrate the technologies, not only to local farmers but also to farmers from outside the clusters. Agri-input dealers and maize grain buyers—potential input providers and purchasers of the increased harvests—also attended and interacted with the farmers.

The initial implementation period is 1 year. IFDC is the lead institution, receiving both funds and in-kind technical support from the International Fertilizer Industry Association (IFA), the International Plant Nutrition Institute, the International Potash Institute, and The Sulphur Institute.

Maize Intensification Project Brings Improved Seeds and Fertilizer to Smallholder Farmers in Mozambique

"How many of you have applied fertilizer to your maize crop?" Ninety farmers were asked that question at a March 2009 MIM project field day in Nhamatanda. Not a single hand was raised! But after viewing MIM demonstration plots, most of the farmers knew that improved maize varieties and fertilization would increase their production dramatically.

Maize is the staple food of most Mozambicans, but yields average less than 1 mt/ha. Production is low mainly because most farmers replant traditional seeds from previous harvests for each new crop, sow with both plants and rows improperly spaced, and don't use fertilizers.

Participants at five MIM fields days held in 2008/09 personally planted, fertilized, weeded, and kept records at the demonstration sites. The farmers were also introduced to local input dealers, who supply improved seeds and fertilizers, and to grain dealers, who can buy their increased production.

The MIM project was initiated because the Government of Mozambique, through its new Strategic Plan for the Agriculture Sector (PEDSA), committed to promote agricultural growth through increased use of improved seeds, fertilizers, and crop protection products. PEDSA's 2008/09 goal for maize under intensified management is 50,000 ha, with a target of 120,000 ha in 2010/11.

Farmers at the MIM field day in Nhamatanda.

Mauricio Dengo (left), one of the agri-inputs dealers who attended MIM field days.

EADN: Extending Agro-Input Dealer Networks in East Africa

The Extending Agro-Input Dealer Networks (EADN) project in East Africa aims to improve access to and use of modern production technologies—fertilizers, improved seeds, and CPPs—for smallholder farmers in Kenya, Tanzania, and Uganda. The main focus is to strengthen the capacity of agri-input dealers and expand dealer networks to better serve farmers. IFAD provides funding for EADN.

EADN Objectives

- Increase incomes of smallholder farmers by improving access to and use of modern inputs and linkages to value chains.
- Extend dealer networks and improve services to farmers in remote areas.
- Reduce transaction costs for agri-inputs.
- Develop regional linkages among dealer associations to improve buying power, address cross-border issues, and better serve inland markets.
- Develop innovative learning systems that dealers will use to train sub-dealers to extend supply networks to more farmers. Train dealers to serve as extension agents who provide technical information and services such as soil testing and recommendations for high-analysis fertilizers to smallholder farmers. The dealers should also serve as links to output markets. Other IFAD projects should also capitalize on this experience.
- Facilitate the establishment of trade associations of input dealers with strengthened capacity for organizational, policy, and regulatory reform, and with links to regional associations.

EADN activities are conducted in selected agricultural areas in 30 districts of the three countries. Activities focus on strengthening the capacities of input dealers and establishing linkages among farmers, dealers, extension agents, and other key actors in the input value chain. EADN initiatives will reduce transaction costs, improve the availability and quality of essential inputs, increase farmer demand for such inputs, and strengthen dealer advisory services to farmers.

Capacity building and training are in collaboration with or through IFAD investment projects and other stakeholders in agri-input dealer development in Kenya, Tanzania, and Uganda. Collaborators include the CNFA; AgMark LLC, CropLife, and other agricultural chemical associations; agro-dealer associations; and service providers in both the private and public sectors. Training, technology transfer demonstrations, and various activities are planned with other IFDC projects in the region, when possible.

Trainees visiting a fertilizer warehouse during the training-of-trainers (ToT) session held in Nairobi in March 2009.

Kenya's Ministry of Agriculture Deputy Director addressing a ToT training held in Nairobi in March 2009.

EADN trained 27 service providers from both the private and public sectors in March 2009; 8 were from Kenya, 8 from Tanzania, and 11 from Uganda.

Expected Outputs from EADN

- More than 500,000 farmers will increase the use of modern inputs, productivity, and income by an average of 35%.
- 1,900 primary agro-dealers will improve services to smallholder farmers.
- 900 new sub-dealers, including stockists that operate only on village market days, will serve rural markets in the three countries. The distance to markets will be reduced by 20% and transaction costs by 10%.
- Six self-sustaining local trade associations will be established and linked nationally and regionally.
- 24 service providers will be trained in the "training-of trainers" method.
- 27 training workshops will be held in 2009.
- More than 45 demonstrations will be established with various crops.

Collaborating Organizations

EADN collaborators include ministries of agriculture, agro-dealers at all levels of the agri-input value chain, and providers of extension and business development services. Other IFAD programs collaborating include the National Agricultural Advisory Services and Vegetable Oil Development Project in Uganda, the Agricultural Marketing Systems Development Program in Tanzania, and the Smallholders Horticulture Marketing Program and Central Kenya Dry Areas Program in Kenya.

[For more information about EADN, see **Capacity Building**.]

GADD: Ghana Agro-Dealer Development Project

The GADD project aims to increase the agricultural productivity and incomes of 850,000 smallholder farmers across Ghana by increasing the availability and affordability of quality agri-inputs, especially seeds, fertilizers, and CPPs. These goals will be achieved mainly through capacity building and support of 2,200 agro-dealers (including 730 who had been trained previously) and 150 seed producers.

IFDC began implementing the 3-year, $2.5-million GADD project in October 2008. The project is funded by the Alliance for a Green Revolution in Africa (AGRA).

The project's main activities are:

- ***Agro-dealer capacity building***—Strengthen the technical and business capacities of agro-dealers through training and, sometimes, economic assistance. Establish business linkages with seed and other input suppliers and facilitate their retail networks to supply more agri-inputs to a greater number of farmers.

- ***Institutional strengthening***—Encourage agro-dealers to join or establish trade associations. Provide technical assistance and training to the Ghana Agricultural Associations Business and Information Center (GAABIC) and its consortium associations. This includes advocating policy reform and developing financial self-sufficiency.

- ***Financial support***—Facilitate financing for agro-dealers, largely through risk-sharing arrangements, so they can develop sound businesses.

- ***Technology transfer***—Train dealers in both the value and proven methods of providing services to farmers, such as field demonstrations and soil testing.

The GADD project plans to:

- Increase sales and use of improved seeds by 50% over 3 years.
- Increase fertilizer use by 30% among 850,000 smallholders.
- Ensure that the GAABIC consortium is organizationally, managerially, and financially sustainable.
- Establish a Ghana Agri-Input Dealers Association with 1,000 members and the capacity to provide members with technical, business, marketing, and extension skills.
- Leverage a $500,000 credit guarantee to obtain $5 million in new credits to expand business for agro-dealers.

Highlights of the First 6 Months:

- ***A standard module for agro-dealer training***—GADD has developed a training curriculum and module to certify Ghanaian agro-dealers. Ghana's Environmental Protection Agency will register only agro-dealers with GADD certification.
- ***Introduction of bills in Ghana's Parliament regarding seed, fertilizer, and CPPs.***
- ***Agro-dealer training***—GADD trained 569 agro-dealers in its first 7 months of operation—26% more than the target of 450 dealers/year. A cost-sharing program with agri-input dealers has been initiated that will make training more efficient and sustainable.

Agricultural Markets Development Program Through NEPAD: The New Partnership for Africa's Development

IFDC is providing technical support on fertilizer sector development to NEPAD and AGRA.

The NEPAD support is for monitoring, evaluating, and reporting on the progress of Sub-Saharan African countries and regional economic communities (RECs) in implementing the *Abuja Declaration on Fertilizers for an African Green Revolution*, endorsed by African heads of state at the Africa Fertilizer Summit in June 2006. This is in accordance with Resolution 12 of the Declaration.

The IFDC support is through NEPAD's Agricultural Markets Development Program, whose main objective is to facilitate the implementation of Pillar 2 of the Comprehensive Africa Agriculture Development Program (CAADP), which focuses on market development issues of rural infrastructure, trade, market access, and regional markets. The Pillar 2 framework document, whose role is to guide implementation at the country and regional level, identifies five strategic areas. One area, "Value Chain Development and Financial Services in Strategic Sectors," focuses on fertilizer and seed systems development.

IFDC is supporting AGRA's Soil Health Initiative by providing information on effective strategies to improve soil health, particularly in the areas of policy and market development.

IFDC seconded an agricultural economist, Dr. Maria Wanzala, to the NEPAD Secretariat in Johannesburg to manage the program. Funding is through AGRA.

Key Activities and Achievements Include:

- **Abuja Declaration: Monitoring and Progress Reports**

  NEPAD has monitored progress in Abuja Declaration implementation and prepared four biannual progress reports based on data and information received from participating countries and RECs for African heads of state. These have been submitted to the African Union Commission (AUC). Progress reports were presented at the 2nd CAADP Partnership Platform in September 2007 and at a meeting of eight ministers of agriculture and finance from eastern and southern Africa that AUC and the African Development Bank (AfDB) convened in Nairobi in March 2009. NEPAD presented implementation progress in June 2009 at both the Africa Forum of IFA in South Africa and the Fertilizer Symposium of the Common Market for Eastern and Southern Africa (COMESA) in Zambia.

- **Collaboration with the AfDB**

  - After the Africa Fertilizer Summit, AfDB prepared a framework document for the establishment and hosting of the Africa Fertilizer Financing Mechanism (AFFM) and a legal instrument for its establishment. In March 2008 the AfDB Board of Governors approved the establishment of AFFM. AfDB has drafted its operational guidelines, advertised for a Coordinator of the AFFM and support staff, and formed the Governing Council of the AFFM to provide the policy and strategic direction of the fund.

  - In March 2009 the AU and AfDB convened a meeting in Nairobi of eight ministers of agriculture and finance from eastern and southern Africa to review three proposed models for regional procurement of fertilizers. The economies of scale of regional procurement would lower fertilizer costs to agro-dealers and thus, to farmers. NEPAD presented progress on Abuja Declaration implementation. The petroleum model garnered the most support from the Ministers and other stakeholders. AfDB agreed to facilitate the preparation of a revised petroleum model based on feedback from the ministers that may guide initiatives for regional procurement.

  - Another outcome of the meeting is ongoing discussions regarding the launching of pilot projects for regional fertilizer procurement for Rwanda, Tanzania, and Uganda via the Port of Mombasa and for Malawi, Mozambique, and Zambia via the Port of Beira.

  - NEPAD and AfDB jointly presented progress on the Abuja Declaration and on establishment of the AFFM at the Experts' Meeting of the AU Ministers of Agriculture Conference in April 2009.

- **Mobilization of Technical and Financial Resources to Support Implementation of Country and Regional Fertilizer Interventions**

  Manstrat, a private company in South Africa, has developed an agronomic and market information system that equips extension workers with communication technology to improve their services to both small- and large-scale farmers. The South African Department of Agriculture is funding its use. NEPAD and the IFDC representative will support Manstrat in the initiative, particularly by expanding it into the SADC region. Some project proceeds will support development initiatives for stakeholders, particularly farmers.

- **Collaboration with AGRA**

  The IFDC/NEPAD staff member supports AGRA's Soil Health Initiative by helping develop strategies to improve soil health. Key activities include:

  - *Mission to Tanzania (Oct. 5–8, 2008)*. NEPAD and AGRA reviewed Tanzania's fertilizer supply chain to identify logistical, policy, and administrative interventions to improve fertilizer delivery and reduce its

cost to farmers. Preliminary findings were that subsidies may be the best policy to achieve an African Green Revolution.

NEPAD's contributions, based on its comparative advantage in policy advocacy, peer review, and lobbying, could include: (1) developing policy guidelines for the design, management, finance, and evaluation of subsidy programs; (2) facilitating dialogue, sharing of experiences, and peer review among countries on subsidies; and (3) helping countries lobby for subsidy financing. AGRA and NEPAD will continue to study interventions to support the development of an extensive agro-dealer network and find other ways to reduce costs along Tanzania's fertilizer value chain.

- *Mission to Zambia (April 22–25, 2009)*. NEPAD and AGRA met with COMESA and the Minister of Agriculture to review issues on fertilizer sector development, particularly a pilot program for regional procurement, reform of the fertilizer support program, and development and expansion of agro-dealer networks. The team also visited an agro-dealer development project implemented by CARE International with AGRA funding and the Conservation Farming Unit. NEPAD may organize study tours for other eastern and southern African countries to learn from the successful activities of the Conservation Farming Unit.

- **Submission of Articles for the NEPAD Newsletter**

IFDC staff contribute articles to inform stakeholders of activities and progress in implementation of the Abuja Declaration and in market development for agri-inputs in Africa. A recent article was "Africa Needs 'Smart' Fertilizers."

CropLife and IFDC Sign New MOU for Additional 5-Year Term

Dr. Rudolf Guyer, Executive President of CropLife Africa Middle East, and Dr. Marjatta Eilittä, Director of IFDC's North and West Africa Division (NWAFD), signed a Memorandum of Understanding (MOU) for a renewable 5-year term. This partnership will build on the previous accomplishments of the first MOU between CropLife and IFDC (signed in April 2004). The partnership will provide support for farmers involved in agro-processing.

"We are pleased to work with IFDC toward global sustainability based on the targets put forth by the United Nations Commission for Sustainable Development," Guyer said. "Substantial progress has been made in bringing the theme of agriculture back to the development agenda."

IFDC and CropLife renew MOU to support agro-processing. Seated left to right, Mr. Bama Yao, CropLife West and Central Africa Hub Coordinator; Dr. Marjatta Eilittä, Director of IFDC's North and West Africa Division; Dr. Rudolf Guyer, Executive President, CropLife Africa Middle East; and Dr. Kofi Debrah, IFDC's Country Representative to Ghana.

"The original collaboration with CropLife 5 years ago came from the shared conviction that the safe and appropriate use of inputs is the key to increasing agricultural productivity in Africa," said Eilittä.

Some highlights of the previous 5 years include:

- **13 ToT and follow-up courses were facilitated.**
- **8 Master Trainers were trained to facilitate ToTs in English, French, and Arabic in Cameroon, Côte d'Ivoire, Egypt, Ghana, Madagascar, Namibia, Nigeria, and Tunisia.**
- **A ToT manual and an agro-dealer manual on the safe use of CPPs and integrated pest management (IPM) were developed.**
- **Input dealer associations were strengthened.**
- **There was collaboration on harmonization of regulations at the regional level.**

Plans for the future partnership include:

- **One IFDC staff member will work 50% of the time for CropLife as an association specialist to coordinate training programs, evaluate training efforts, coach Master Trainers, and assist in starting IPM courses in Africa and the Middle East.**
- **IFDC will support national CropLife associations to be more active in the Africa Stockpile Program (ASP). The ASP is a multi-stakeholder initiative that aims to clean up obsolete pesticide stockpiles in Africa, prevent future toxic threats from such stocks, and protect livelihoods and the environment. Partners include participant countries, CropLife International, FAO, PAN-Africa, PAN-United Kingdom, the World Bank, and the World Wildlife Fund.**

Guyer expressed his thanks to Rob Groot, IFDC's Director for East and Southern Africa, and CropLife's Yves Demeure, who pioneered the initial cooperation. Appreciation was also expressed to Bama Yao of CropLife and to IFDC's Manon Dohmen.

— Eurasia —

Albania Credit Enhancement Fund

IFDC is utilizing monetized funds from a 2003 Food for Progress program in Albania. The technical program targets improving (a) technology introduction in dairy and livestock operations and (b) access by agribusiness enterprises (livestock and dairy) to bank credit. Technology introductions in dairy have yielded mixed results. Improvements have occurred in the availability of dairy animals (e.g., via importation of Holstein stock), in the application of modern dairy equipment in production and processing, and in feed quality. Dairy farmers have been trained to better manage their operations and understand the complexities involved in both production and management. Farmers' capacity to incorporate improved technologies in their operations has improved.

But, the program has languished in other areas. A Credit Enhancement Fund (CEF), which included a Loan Guarantee Agreement (LGA) mechanism, facilitated improved access to commercial credit to support private sector investment. The LGA was originally funded to a level of lek 212 million.[1] Initially, loan portfolio performance was satisfactory.

In late 2006, it became apparent that the Albanian dairy industry was experiencing a set of unforeseen challenges—namely, a rapid fuel price escalation (exacerbated by the withdrawal of the government subsidy of diesel); market-related (trade policy) barriers that adversely affected the competitive position of the dairy industry; a 2-year drought that severely limited feed production; and untimely power supply interruptions in rural areas that disrupted operations at critical times. The impact of these factors on the dairy industry was extreme. Recent performance of the CEF program has been poor with less than 60% of loans on a "current pay" status.

KAED II: Kyrgyz Agro-Input Enterprise Development

KAED II is continuing to help increase the production of two staple foods in Kyrgyzstan—wheat and milk—through a 2-year extension granted by USAID. KAED has reached 300,000 farmers and helped open 35 farm stores.

KAED encourages farmers to adopt practices that will increase food production, animal health, and rural incomes in Kyrgyzstan. The project's objective is to improve food security by increasing wheat yields and by improving livestock feed and dairy cow care to reduce loss of vital livestock and increase milk production.

The project will build on its long-established relationship with the Association of Agribusinessmen of Kyrgyzstan (AAK), a trade association that KAED developed. Other project partners include associations, local service providers, government agencies, and USAID.

Highlights:

- Twenty-one stores run by AAK dealers doubled annual turnover from $22 million in 2007 to $45 million in 2008.
- Fertilizer imports in Kyrgyzstan totaled 107,000 mt in late 2008—20,000 mt more than in 2007, despite record high world market prices.
- The two major crop protection companies in Kyrgyzstan increased sales by 65% in 2008, compared with 2007; certified seed sales grew by 25%.

[1]It is noteworthy that the loan guarantee mechanism is a guarantee that the bank enjoys against borrower default of the principal amount of a loan. The bank also requires that borrowers provide sufficient collateral to support a loan. The recovery procedures for "loans in default" first require recovery against collateral and thereafter recovery against the LGF. The complexity of loan recovery against collateral is substantial and effectively results in recovery against the guarantee fund.

- KAED linked the small Kyrgyz input market with reputable international suppliers, resulting in 12 new business relationships in 2008, initially valued at more than $2.1 million.
- AAK farmer customers harvested an average 7 mt/ha of maize grain in 2008, compared with the country's average of 5 mt/ha. The distance traveled by AAK farmers to buy quality inputs in 2008 was reduced by 2.5 miles. Non-AAK members had to travel 7 miles.
- KAED will implement a USAID-funded seed program that will help about 35,000 farmers produce quality seeds by the fall of 2009; an estimated 4,500 mt of seeds will be produced.
- KAED procured 1,400 mt of animal feed and distributed it through the private sector during February–March 2009.
- KAED held dairy cattle shows to promote increased milk production from improved breeds.
- KAED is helping rehabilitate abandoned land for agricultural use through USAID Kyrgyzstan's Southern Initiative.

KAED Promotes Improved Dairy Cattle Breeds and Animal Feed to Increase Milk Production in Kyrgyzstan

Dairy Cattle Shows

Dairy cattle shows organized by KAED promoted increased milk production from improved breeds. The cattle shows took place in Karasu and Sokuluk, Kyrgyzstan, in October and December 2008.

"Many Kyrgyz farmers lack proper feed to sustain their herds, which limits milk and meat production," says Dr. Hiqmet Demiri, KAED Chief of Party. "They also lack information on modern techniques to raise cattle."

KAED works to improve feed and care to enhance dairy cattle health and productivity. About 130 farmers observed the potential of new breeds and learned modern management techniques for dairy cows at the cattle shows. Seven cows were sold in auctions.

"A cow's breed influences the yield and quality of the milk it produces," Demiri says. "That's why KAED promotes genetic improvement of dairy cows, mainly by encouraging farmers to use artificial insemination and introducing the farmers to improved breeds that private breeders will bring to the Kyrgyz market."

An improved heifer of the milk cow breed Swiss Brown being shown to Kyrgyz farmers during a cattle show in Sokuluk, northern Kyrgyzstan. (Photo credit: Dalil Batyrov, AAK)

KAED organized the cattle shows in partnership with Central Asian Breeding Services, a private enterprise that works with cattle breeding centers in Europe and supplies improved breeds to Kyrgyzstan.

Distribution of Animal Feed

KAED procured 1,400 mt of animal feed and distributed it through the private sector during February–March 2009.

"This will reduce the livestock death rate by 30% and winter weight loss of animals by 50%," Demiri says. "Average milk production per cow in winter months will increase from 3 liters to 5 liters per day."

The intervention will generate demand for high quality livestock feed, contribute to the establishment of an animal feed market, and promote improved livestock management practices. More than 20,000 dairy farmers will benefit.

AAK and KAED II Hold "Agro Expo Silk Way"

KAED II and AAK held the fifth annual "Agro Expo Silk Way" in Osh, southern Kyrgyzstan, February 26–28, 2009, to give farmers access to agri-inputs and information on advanced agricultural techniques.

About 3,000 farmers and 38 local and international companies participated in the exhibition. Farmers were able to buy inputs before the season started, attend seminars by agricultural experts, learn skills for successful business management, and make business deals. Participating companies made 128 new business contacts and developed 12 contracts. Two companies reported making contracts worth about $40,000.

A roundtable discussion on food security in Kyrgyzstan was held; USAID country representative Pat Shapiro and representatives of Parliament and Kyrgyzstan's Ministry of Agriculture attended.

Distributing KAED materials at Agro Expo Silk Way.

KAED II Helps Supply Improved Wheat Seeds to Kyrgyz Farmers

KAED will implement a USAID-funded pilot seed program that will help about 35,000 farmers produce quality seeds by the fall of 2009.

"KAED will teach Kyrgyz farmers improved techniques that will increase wheat productivity and develop a market-oriented process for distributing improved wheat seeds," says Dr. Demiri.

Kyrgyzstan has an annual deficit of 400,000 mt of bread wheat. Yields are low because of outdated wheat varieties, poor quality seeds, and improper management.

"The lack of high quality seeds accounts for about 40% of Kyrgyzstan's wheat deficit, according to a KAED survey," Demiri says.

The seed program's two objectives are to strengthen Kyrgyzstan's seed sector and to improve farmer access to quality seeds. The main focus is to improve food security through increased wheat production.

USAID allocated US $300,000 to buy 275 mt of winter wheat seeds from the Krasnodar Research Institute of Agriculture in Russia through the International Center for Agricultural Research in the Dry Areas. The seed arrived in Kyrgyzstan in October 2008.

KAED is distributing the seed for further multiplication on seed farms with the help of AAK, the Seed Association of Kyrgyzstan, and the Cooperative Union of Kyrgyzstan.

Distributing seeds in Kyrgyzstan.

KAED sold the seeds at subsidized prices—about 25% lower than the local market price. Funds from seed sales will go to a revolving fund that will be sustainable long after the project ends.

"The impact will extend beyond 2009," Demiri says. "If the estimated 4,500 mt of quality seed to be produced in the summer of 2009 is sold at current Krygyz market prices, it will be worth $2.7 million. That means that the $300,000 intervention will yield a nine times higher return rate in a single growing cycle, making it the most serious investment in the Kyrgyz seed industry in 20 years."

Based on the additional 4,500 mt of seed, farmers will be able to plant up to 21,000 ha of wheat in the fall of 2009. Yields are expected to double from 2 mt/ha to 4 mt/ha on the planted area due to application of advanced packages of technology and management including improved seeds and balanced fertilization. This would allow farmers to produce 42,000 additional mt of wheat in the summer of 2010.

"The value of incremental production will be $14.7 million," Demiri says.

KAED II Opens Farm Store in Kara-Balta

KAED II opened a farm store in Kara-Balta, Kyrgyzstan, on May 20, 2009. Baktybek Jumaliev is the store owner and member of AAK.

"Farm stores are the best channel to promote and distribute quality certified seeds, fertilizers, and crop protection products," says Dr. Demiri. "The stores give farmers access to information, quality inputs, and linkages with multinational companies."

The store sells vegetable seeds; melons, gourds, and other plants; N, P, K, and turf fertilizers; CPPs; and veterinary medications. Customers are offered consulting services on fertilizer application, how to grow various plants, and veterinary care.

Farm store owner Baktybek Jumaliev and his first farmer customers.

Other Successful Retail Farm Stores in Kyrgyzstan

Osh Krastex, one of the most successful retail and wholesale farm stores in Kyrgyzstan, increased its turnover of agri-input sales from $20,000 in 2005 to almost $400,000 in 2008. In addition to carrying quality fertilizer, seed, and CPPs, Osh Krastex has developed an effective system of transferring knowledge to farmers.

AgroVetService provides quality inputs for agriculture and veterinary medicine. Located in Osh, its average annual turnover rate is $260,000–$300,000.

Agro Fighters opened in 2006 in the Aravan Village. With KAED's help, Agro Fighters quickly increased business and reached $23,400 annual turnover in 2008.

Rayhan is run by an AAK businesswoman. Baltabaeva Rayhan started the business in Batken Oblast in 2004 with only $400. By 2008 annual turnover rose to $40,000.

KAED II Funds Map of Kyrgyz Food Processing Companies

KAED II is funding the production of 100 copies of a map of food processing companies in Kyrgyzstan. The map was developed by Kyrgyzstan's Ministry of Agriculture, Water, and Processing Industry.

Cover of KAED publication that maps food processing companies in Kyrgyzstan.

The map contains thorough information and the location of 9,388 small, medium, and large agri-product processing companies registered as of December 31, 2008. The companies are divided according to regions and industrial sectors. The map also includes information on new companies that are planned to be in operation by 2009–10.

"The map represents the first coordinated efforts by the Ministry of Agriculture and the private sector to improve the access by various producers to processing facilities across the country," says Dr. Demiri. "It will help bring together producers and processors and allow both parties to make informed decisions on opportunities and markets. The map will also help potential investors learn about Kyrgyzstan's processing capacities."

The maps were distributed May 7, 2009, to government institutions, managers of processing enterprises, and members of an association of horticultural companies and an association of viticulture.

KAED is financed by USAID.

KAED II Helps Rehabilitate Abandoned Farmland Through USAID-Kyrgyzstan's Southern Initiative

KAED II is helping rehabilitate abandoned land for agricultural use through USAID-Kyrgyzstan's Southern Initiative, which was launched in late 2008 in Markaz Ail-Okmotu of Batken Oblast in southern Kyrgyzstan. In addition to KAED, collaborators of the initiative include the Land Reform Project implemented by Chemonics International, Water Users Association Project implemented by Winrock, and the Central Asian Micro Finance Alliance implemented by Agricultural Cooperative Development International/ Volunteers in Overseas Cooperative Assistance (ACDI/VOCA).


Irrigating the land in Markaz, Kyrgyzstan.

An auction to rent 35 ha of land was held on February 27, 2009. The next day, the renters began irrigation work, gathering and removing stones from the field, and smoothing the roughness of the plots. Plowing, harrowing in two traces, furrowing, cultivation, and digging of ditches were also done.

KAED has worked closely with the local government, making sure that the community plays an active role in the rehabilitation. The work was done in collaboration with farmers on a cost-share basis, in which KAED invested $15,000, and farmers invested $2,500. KAED II plans to invest $40,000 until the end of the growing season.

High-quality varieties of barley and alfalfa were purchased from farm stores run by AAK. The seeds were planted, and sprouts of barley and alfalfa have already surfaced.

KAED established a demonstration field on forage crops on 1 ha of irrigated arable land and will conduct field days, seminars, and training sessions on forage crop cultivation and methods of land fertility improvement.

KAED is spending about $400/ha to bring the degraded land into full production. It is estimated that 30,000 ha of agricultural land is degraded. Rehabilitation will directly contribute to Kyrgyzstan's food security.

Capacity Building

— Asia —

Bangladesh: UDP Training

IFDC and DAE have trained more than 6,000 extension staff and 250,000 farmers in UDP technology.

Under the ILSAFARM project, initiated in mid-December 2008, IFDC has conducted almost 1,100 training programs involving more than 43,000 farmers; 9% were women.

IFDC has also trained more than 1,140 urea briquette producers, including 120 trained through ILSAFARM.

[For more information on UDP, see **Improving Resource Efficiency**.]

FARMS: Food for Agricultural Revitalization and Market Systems

Agriculture accounts for 60% of Afghanistan's economy, but long-term wars, instability, and drought have depleted the soil and devastated food security. Only 12% of the country's land is arable. Agricultural production has remained stagnant due to inefficient use of agri-inputs, poor management practices, and inadequate technology transfer.

IFDC's FARMS project is working to reduce rural poverty and improve farm livelihoods in Afghanistan. FARMS promotes best management practices in cereal and vegetable crops and helps the milling industry develop a self-sustainable market. Activities are implemented in six provinces.

Highlights:

- More than 350 research trials were conducted in cereal and vegetable crops from 2005 to 2008 at six research stations in collaboration with MAIL. The purpose of the trials was to evaluate and refine new water- and nutrient-saving technologies such as drip irrigation, urea supergranules, and fertigation. About 5,000 soil samples were collected and analyzed for important soil characteristics. In addition, IFDC headquarters conducted detailed analyses on soils representative of the six provinces. These results were combined with IFDC's crop modeling capabilities to develop improved fertilizer recommendations for wheat.
- FARMS held training sessions for MAIL staff on conducting independent research and extension activities. Two training sessions were on theoretical concepts of various statistical methodologies.
- Four trials were conducted on wheat varieties resistant to Ug 99, a wheat rust threatening Afghanistan's wheat crop. MAIL was encouraged to promote new, genetically resistant varieties.
- Sixteen trials were conducted in drip irrigation systems for tomato and cabbage crops. Results suggest that these systems improve yields and the efficiency of water and nutrient use.
- Promotional materials such as brochures, banners, and articles were translated into local languages and distributed to MAIL, researchers, extension agents, farmers, and other stakeholders.
- FARMS conducted 11 studies of the wheat business market in collaboration with commercial mills, public flour mills, private sector companies, agriculture cooperatives, baking industries, and *asiabs* (small diesel and water mills). Several training sessions were held for the milling industry.
- FARMS formed the Afghanistan Flour Mills Association, Afghanistan's first association of commercial and public sector flour mills.
- FARMS designed market development and consumer education programs to promote the consumption of locally produced flour.

IFDC is also working as a collaborating agency for USAID's Afghanistan Water, Agriculture, and Technology Transfer (AWATT) project. AWATT is working to employ technology in resource conservation and risk management to improve the country's agricultural sector.

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

UDP trials in transplanted rice in Nangarhar Province, Afghanistan.

KAED II: Kyrgyz Agro-Input Enterprise Development

KAED II is currently working with 70,000 farmers and will reach about 100,000 through outreach campaigns to train them in advanced technology, farm management, mechanization, ISFM, and crop protection techniques. KAED held a training session on increasing winter wheat yields on April 15, 2009, in Kara-Balta, Kyrgyzstan.

The training covered specifications of grain crops, varieties of winter wheat that are cultivated in Kyrgyzstan, cultivation technologies of winter wheat, and pest protection. In addition, trainees learned how to calculate the gross revenue of winter wheat.

Since July 2008, KAED has conducted 67 training sessions and workshops on various technical and management issues. More than 3,750 farmers and dealers were trained. Of these, more than 400 were women.

Wheat training session in Kara-Balta, Kyrgyzstan.

AIMS: Agricultural Input Markets Strengthening Project

Highlights of the capacity building component of the AIMS project for input market development in Mozambique include:

- AIMS staff trained 44 specialists, including agri-input wholesalers, extension agents, and NGO staff, in how to use agri-inputs properly, in marketing skills, and in how to become trainers themselves. Many of the trainees later joined the AIMS staff as "core trainers" to help train 201 agri-input dealers and suppliers in villages in eight districts in Nampula and Zambezia provinces in the Nacala Economic Corridor, and in another eight districts in Sofala and Manica provinces in the Beira Corridor.

  The curricula for training the new dealers in the districts included training in the basics of soil fertility, fertilizers, CPPs, seed production and marketing, economic reasons for the use of improved seeds, handling and storage of agri-inputs, demand forecasting, managing working capital, managing stocks, marketing, and business record-keeping.

- After the first training phase for these agro-dealers, AIMS helped establish an agro-dealer trade association, *Associacao Mocambicana de Provedores de Insumos Agropecuarios (AMPIA)*. To assist AMPIA, AIMS also translated and distributed the IFDC manual *Management of Agri-Dealer Associations: A Starter Kit.* The manual is a day-to-day guide on the formation and management of an association.

- In collaboration with the Agricultural Research Institute of Mozambique (IIAM), AIMS established 17 field demonstrations to show agro-dealers how useful demonstrations can be in promoting agri-input use, and in decision support systems to identify crop nutritional needs. Dealers were also taught how to use portable soil testing kits and PDAs (hand-held computers) programmed with the Nutrient Management Support System (NuMaSS) to calculate fertilizer requirements for specific locations. This was followed with assistance to the MIM project to establish eight additional field demonstration plots established by clusters of farmers served by agri-input dealers.

[For more information on AIMS, see **Improving Market Efficiency**.]

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

CATALIST activities are helping farmers learn the importance of using fertilizers and ISFM. ISFM is the combined use of mineral fertilizers and soil amendments to improve soil quality.

CATALIST has held 56 farmer field days, reaching about 2,000 participants. The capacities of 316 input dealers and 65 cooperatives have been strengthened. CATALIST has also helped facilitate the opening of 18 agri-input stores and cooperatives in the region. The transaction costs of inputs supplied in Rwanda have been reduced by 35%.

Many CATALIST activities are executed by rural development stakeholders. For example, LOFEPACO, a women's farmer organization in northern Kivu, DRC, initially worked with 60 farmers but now works with 300 farmers.

During a CATALIST meeting, a number of women farmers declared that "fertilizers save our marriages!" They said, "Our husbands now respect us. We get more crops and income from our small 4-ha plots than they get from their land. We have bank accounts, and our husbands ask us to keep some of their money in our accounts."

Farmers work on terraced land.

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

CATALIST Support to Rwanda's Crop Intensification Program

Currently, Rwanda produces 90% of its food needs, but high population density (340 persons/square kilometer), low input agriculture, and hilly topography have resulted in land degradation and soil infertility. Generally, food crop yields in Rwanda are low, primarily because of limited use of yield-enhancing technologies, such as mineral fertilizers and improved seeds. To revitalize the agricultural sector, the Ministry of Agriculture, Livestock, and Forestry (MINAGRI) developed the Crop Intensification Program (CIP) in 2007 for implementation in 2008. The CIP involves procurement and distribution of mineral fertilizers and increased production and distribution of improved seeds. It represents MINAGRI's primary effort to help Rwanda become self-sufficient in food production.

When increased fertilizer costs threatened the CIP in 2008, the CATALIST project worked with MINAGRI to implement: a) fertilizer procurement procedures to improve efficiency; b) fertilizer auctions for private dealers, cooperatives, and farmer associations; and c) targeted fertilizer and seed voucher programs for wheat and maize producers. The fertilizer auction program addresses the Government of Rwanda's desire to build a strong private sector agri-input distribution system by involving the private sector in the purchase, sale, and national distribution of the government-procured fertilizer inputs. The targeted voucher program (implemented through farmer cooperatives and NGOs) introduces farmers to improved technology packages that increase their awareness of the role mineral fertilizers and improved seeds play in increasing food crop production. While both programs provide a short- to medium-term solution to increase crop production, they also provide the foundation for long-term sustainable food security and private-sector development.

From June to September 2008, CATALIST assisted MINAGRI in the timely delivery and auctioning of approximately 7,500 mt of fertilizers to private sector dealers, importers, and traders. Of this tonnage, about 5,500 mt of urea and DAP fertilizers were to be distributed through the voucher program to fertilize 65,000 ha of maize and wheat at an average application rate of 21.5 kg/ha. Assuming an average farm size of 0.75 ha, more than 80,000 farmers (many first-time users) now had access to mineral fertilizers. Adding mineral fertilizer to these farmers' management practices is conservatively estimated to increase yields by 17,200 mt of additional cereals or provide sufficient nourishment for more than 70,000 additional people annually.

Rwandan agriculture has three cropping seasons. During Season A (short rains) 14,832 vouchers were distributed for maize and 2,790 vouchers were distributed for wheat. Each voucher covered 1 ha and provided access to 100 kg of DAP and 50 kg of urea. The fertilizers supplied via the vouchers corresponded to 1,762 mt of DAP and 881 mt of urea. Maize yields of farmers guided by CATALIST rose by 2.5 mt/ha over traditional practices; wheat yields rose by 1.5 mt/ha. If we assume that farmers with less supervision would see overall yields increase by 1.5 and 1 mt/ha for maize and wheat, respectively, this would produce an additional 22,000 mt of maize and 2,800 mt of wheat. Assuming 250 kg/person/year, this additional production would provide food for more than 90,000 people.

"Where There's a Will, There's a Way!"

Yvonne Karenzo, a farmer in Musanze, Rwanda, participated in Rwanda's Crop Intensification Program. The program provided farmers with vouchers for a fertilizer package of 100 kg of DAP and 50 kg of urea.

After seeing a demonstration of the package, Karenzo exclaimed, "I have never seen such healthy corn ears in my entire life!"

Karenzo felt sure she could convince other farmers to jointly buy the fertilizer package. "Where there's a will, there's a way," she said.

Karenzo used money from the sale of her harvest to buy a mobile phone. "Now I can easily communicate with CATALIST agronomists."

During a recent farmer field day, 352 farmers visited the plots of Karenzo and her fellow farmers. Of those farmers, 310 decided to purchase MINAGRI's subsidized fertilizers.

EADN: Extending Agro-Input Dealer Networks in East Africa

The training of agri-input dealers in Kenya, Tanzania, and Uganda is an objective of the EADN project. A training program for 27 potential trainers (18 men, 9 women) from the three countries was held March 9–20, 2009, at the headquarters of the African Insect Science for Food and Health in Nairobi. The participants were from local government agencies, ministries of agriculture, the private sector, and training institutes.

The first week emphasized "training of trainers"—developing training skills. The second week focused on technical training.

The first part of the ToT program covered preparation of a training program; adult learning; training methods, aids, and skills; evaluation; and follow-up. In the second part, each participant organized a 20-minute training session on agri-inputs.

The second week focused entirely on technical knowledge of fertilizers, pesticides, seeds, and agri-input marketing.

The EADN training participants display their new training certificates. Course coordinator Philip Karuri is standing in the second row, second from right. Trainer Manon Dohmen stands to Karuri's left and trainer Herman Louw sits in the front row (wearing blue jeans, no certificate).

Most topics were completely new to the participants, even though many had training experience and some had participated in previous training programs. Thus, most participants were highly motivated. Knowledge gained was evaluated through pre- and post-course tests and during individual lessons. A few participants scored higher than 90% in the written test.

[For more information on EADN, see **Improving Market Efficiency**.]

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

The STAR project enhances regional trade in agricultural inputs, particularly seeds and fertilizers, to promote food security and agricultural growth in Sub-Saharan Africa.

The 3-year (2007–2010) project is funded by the William and Flora Hewlett Foundation and implemented in collaboration with COMESA, the East African Community (EAC), and SADC.

Both COMESA and EAC have hired economists to implement project activities in policy environment, capacity building, and market transparency.

SADC is using STAR resources to conduct pre-feasibility studies on improvement of the capacity and utilization of existing fertilizer plants and to assess the economic viability of building new plants.

STAR activities include:

- A pre-feasibility study was conducted on the establishment of a regional fertilizer holding warehouse at the Port of Beira, Mozambique, to reduce transaction costs and improve the fertilizer supply in southern Africa. The study was fully endorsed by all stakeholders, including Mozambique's Minister of Agriculture. Discussions have been held with the Government of the Republic of Mozambique (GRM), private sector investors, and development partners to establish the warehouse.
- A policy dialogue was held with GRM to remove taxes on fertilizer imports and restrictions on re-export of fertilizers. GRM has agreed to remove these restrictions for an initial 3-year period.

- A market- and farmer-friendly voucher system to promote use of improved seeds and fertilizers among resource-poor smallholder farmers in Mozambique was initiated. IFDC will work with FAO and GRM to implement the voucher system for 25,000 farmers on a pilot basis with funding from the European Union and USAID.
- STAR conducted a capacity building training program for agro-dealers in Arusha, Tanzania, in December 2008. Training topics included business development and how to access business financing; social approaches to marketing; association building; and storage, handling, and demand forecast for inputs. A field trip to the Minjingu Phosphate Rock Mine and factory offered participants the opportunity to see the mining of raw materials and granulation of fertilizer products.
- Julius Mathende and Gloria Phiri, STAR/COMESA staff, visited IFDC headquarters Oct. 24–Nov. 1, 2008, to interact with IFDC professionals and improve professional communications.

Other STAR highlights follow:

Policy Workshop on Strengthening Trade in Agricultural Inputs in Africa

In collaboration with COMESA, IFDC organized the Policy Workshop on Strengthening Trade in Agricultural Inputs July 1–4, 2008, in Lusaka, Zambia. More than 65 stakeholders from across Africa attended. The main themes included capacity building for trade and market development, regional integration of trade, including regional procurement of fertilizers, market-friendly safety nets, and progress on implementation of the *Abuja Declaration on Fertilizer*. Key recommendations include:

- Strengthening policymaking, emphasizing pricing and marketing policies.
- Removing trade barriers, especially for landlocked countries.
- Improving access to finance by establishing risk management tools.
- Improving fertilizer production capacity.
- Enhancing the performance of fertilizer procurement.

Specific actions were identified for each recommendation.

IFDC will provide the workshop report, *Strengthening Regional Trade in Agricultural Inputs in Africa: Issues and Options*, on request.

Private Sector Roundtable on Expanding Fertilizer Markets in Africa, Lusaka, June 30, 2008

The sharp rises in fertilizer prices in 2008 alarmed many stakeholders and inspired them to find ways to confront the challenge. The AU/NEPAD Food Security Workshop of May 2008 recommended that short-term measures to confront the current food and fertilizer crisis should not compromise long-term development efforts. Thus, USAID requested that IFDC organize a roundtable discussion to discern private sector views on this subject. The IFDC STAR project was already organizing such a workshop, so the two events were combined. USAID provided additional financial support for the roundtable discussion. IFDC and COMESA collaborated on the discussion, attended by more than 30 private sector participants. Recommended action areas include:

- Establishment of the Fertilizer Association of Africa.
- Pre-feasibility studies for improving the capacity utilization of existing fertilizer plants.
- Improved access to finance for fertilizer imports and marketing.
- Establishment of a holding warehouse at Beira and other ports.

A copy of the workshop report, *Expanding Fertilizer Markets in Africa*, is available from IFDC.

COMESA Specialists Partner with IFDC's STAR Program

Two African agri-input trade specialists with COMESA visited IFDC headquarters from Oct. 24 to Nov. 1, 2008, to collaborate on the new STAR project. They were Julius Mathende from Zimbabwe, COMESA Regional Agricultural Input Trade Specialist; and Gloria Phiri from Zambia, COMESA Research Assistant.

Discussing progress of the *Abuja Declaration on Fertilizers* are (left to right) Dr. Balu Bumb, IFDC's leader of the STAR project; Julius Mathende, COMESA Regional Agricultural Input Trade Specialist; and Gloria Phiri, COMESA Research Assistant.

COMESA works with the STAR project to improve market access for African agri-input traders and farmers. Other STAR partners are EAC and SADC.

STAR's main focus is to create conducive policy environments and strong market linkages through capacity building and market transparency. STAR puts special emphasis on Resolution 2 of the *Abuja Declaration on Fertilizer for an African Green Revolution*, which African heads of state and agricultural leaders wrote and adopted at the Africa Fertilizer Summit in June 2006. Resolution 2 recommends measures:

"*. . . to reduce the cost of fertilizer procurement at national and regional levels especially through the harmonization of policies and regulations to ensure duty- and tax-free movement across regions, and the development of capacity for quality control. As an immediate measure, we recommend the elimination of taxes and tariffs on fertilizer and on fertilizer raw materials.*"

Under the Abuja Declaration, fertilizer should move freely and be treated as a strategic commodity without borders.

Fertilizer use in Sub-Saharan Africa is the world's lowest: only about 8–10 kg/ha yearly. Farmers in the Green Revolution countries of Asia use 80–250 kg/ha. The Declaration calls for an increase in fertilizer use in Africa to at least 50 kg/ha by 2015.

COMESA, headquartered in Lusaka, Zambia, is a grouping of 19 African states dedicated to promoting regional integration by removing trade and investment barriers. Its members are Burundi, Comoros, DRC, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, and Zimbabwe.

COMESA has entered into a customs union in 2009 that removes tariff barriers on member countries and applies a common external tariff (CET) on non-members. The proposed CET is 0% for raw materials, 10% for intermediate goods, and 25% for finished products. This will encourage intraregional trade and the importation of raw materials so that finished products can be produced inside the COMESA zone.

COMESA monitors pricing policies to determine if subsidies are working and if regulatory systems are being implemented properly. COMESA also emphasizes professional capacity building. More than 65 people took part in a policy workshop on Strengthening Regional Trade in Agricultural Inputs in Africa, in Lusaka, Zambia, in July 2008. The workshop was organized by COMESA and IFDC.

Mathende and Phiri visited Muscle Shoals, Alabama, to learn about IFDC's STAR project activities. "Seeing is believing," Mathende said. "There is no substitute for being at the project site."

Phiri said, "This trip showed us the range of IFDC resources we can use. We now know who to go to for various types of information." Phiri collects information on fertilizer prices and movement and collaborates closely with IFDC's Market Information Unit.

Mathende said, "The knowledge we gained and the relationships built at IFDC are valuable tools in addressing challenges that confront us in our work. When these challenges overwhelm us, we now know where to seek solutions and advice."

WACIP: West Africa Cotton Improvement Program for the "Cotton-4" Countries

WACIP was initiated to help Benin, Burkina Faso, Chad, and Mali—collectively known as the "C-4" (*Cotton-4)* countries—increase cotton productivity and participate in world trade.

The United States pledged commitment to the Initiative in Favor of Cotton at a World Trade Organization meeting in Benin in 2004. Through USAID, multiple initiatives were organized in support of the cotton sector in the C-4 countries and in Senegal under the broad $17-million WACIP umbrella. Responding to a USAID/West Africa solicitation, IFDC was awarded a 3-year cooperative agreement to lead a consortium to implement the C-4 component of the overall program.

WACIP is increasing incomes for:

- West African cotton farmers, for both cotton and non-cotton crops, by raising yields and improving agri-input use efficiency.
- Cotton processors—ginners, artisans, and textile industrials—by improving the quantity, variety, and quality of cotton products.

IFDC's partners are Abt Associates, Aid to Artisans, and Auburn, Michigan State, and Tuskegee universities in the United States. Most WACIP activities are implemented by African partner agencies through a grants program.

Highlights for Cotton Farmers:

- WACIP's flagship activity is a large-scale training and extension program to promote IPM and ISFM technologies in order to increase yields and promote environmentally sound management of agricultural chemicals.
- WACIP disseminated modern extension packages for cotton, corn, and cowpeas to more than 700,000 C-4 cotton farmers in 2008 and is pursuing similar activities in 2009.
- In 2008, WACIP awarded four contracts totaling $1.3 million to implementing partners for:

    - o Module development: Ten C-4 experts in entomology and agronomy worked with scientists from IFDC and Tuskegee University in March 2008 to develop IPM/ISFM training materials suitable for local conditions.
    - o Training-of-trainers: Those C-4 experts then trained nine top extension agents from each country in IPM/ISFM. These agents in turn trained another 200 cotton extension agents in their home countries.
    - o Establishment of more than 800 IPM/ISFM demonstration fields.
    - o Training of producers: During the 2008 rainy season, more than 700,000 C-4 farmers received IPM/ISFM training; 300,000 received intensive training designed to increase their cotton farming revenues by 15% over 2 years.
    - o Workshops: In March and April 2009, WACIP convened workshops regionally and in each C-4 country. WACIP will work with partners to incorporate lessons learned from the first year and to secure another $1.5 million in grants for the 2009 rainy season.

- WACIP has enhanced the capacity of the C-4 national agricultural research institutes (NARIs) to generate a steady stream of new IPM/ISFM cotton technologies through support for research, new laboratory equipment, better information exchange, and stronger links to extension systems. The WACIP and NARI activities include:

    - o Helping farmers control spiraling agri-input costs and debt load through training and pilot programs to test alternative systems of input supply. WACIP provided $788,500 to C-4 national cotton producer

organizations to support the training of 2,061 managers in Benin, 5,667 in Mali, and 10,002 in Burkina Faso. The training material included estimating input needs, handling of credit, and the distribution, cost recovery, and safe handling of stocks. The training motivated Beninese authorities to amend regulations governing cotton farmer debt. These activities help decrease the high default rates that drive farmers from the cotton sector.

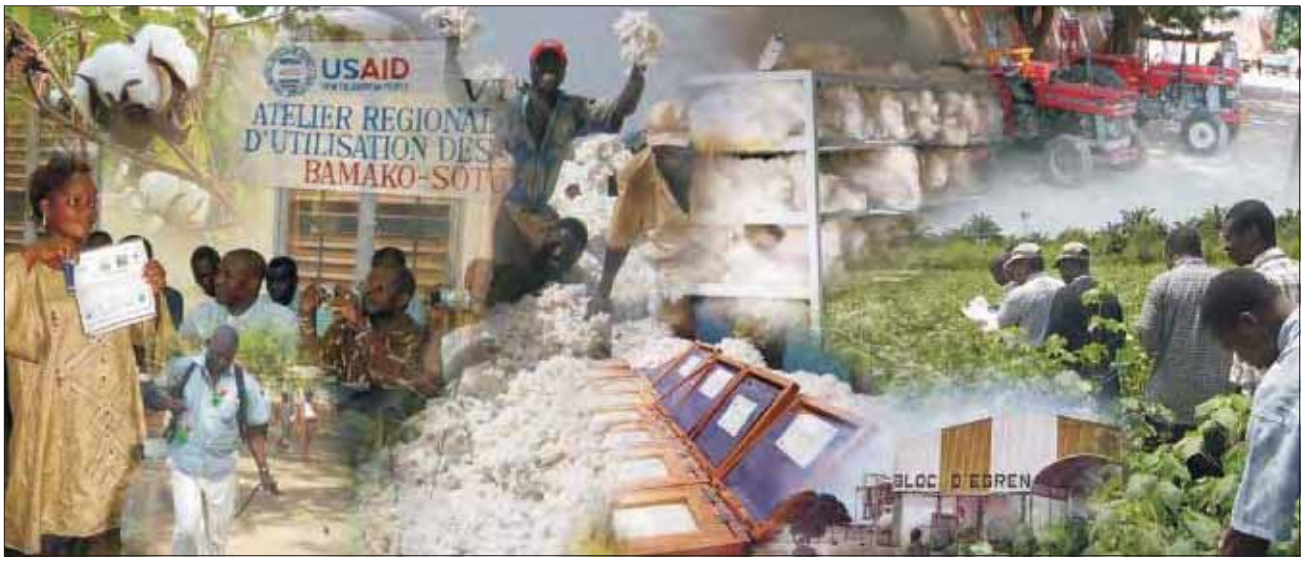
- o Piloting alternative approaches to input provision. Farmers who lack access to fertilizers and pesticides for food crops sometimes divert the inputs that cotton companies give them on credit to food crops, lowering cotton yields and increasing farmers' debts. In January 2009, WACIP funded a regional workshop to study alternative models for providing non-cotton inputs and to develop bankable models for future implementation of such pilots in their countries.

- WACIP has helped develop market chains for fair trade and organic cotton in the C-4 countries.
- WACIP is supporting the safe introduction of genetically modified cotton and helping decision-makers in the C-4 countries understand the basic concepts of biotechnology (Bt) and biosafety. In Burkina Faso, where Bt cotton production is now legal, WACIP is responding to strong demand for capacity building by training scientists, extension agents, and farmers in biotechnology and biosafety. Visits to Bt fields have been organized for more than 300 Burkinabe farmers and opinion leaders and for 60 interested parties from other countries.

Highlights for Cotton Processors:

WACIP is raising processor incomes by targeted investments in ginning and both industrial and artisanal textile production. These include:

- Ginning higher-quality cotton more efficiently.
- Improving the quality of ginned cotton lint. In April 2008, WACIP sponsored a study tour to South Africa for 12 C-4 cotton company managers and farmers to see successful technologies adopted by Cotton South Africa and various farmer groups.
- Linking textile artisans to markets. After identifying a small group of export-ready textile artisanal enterprises in the C-4 countries, WACIP trained 105 artisans (65 of whom were women) from 48 enterprises in the basics of small enterprise management and export. International design experts helped these groups develop new textile products that are being introduced at international fairs in New York and Ouagadougou.
- Developing appropriate textile technologies. WACIP is assisting the efforts of artisans in Mali to provide hand-held carders, a traditional tool used to prepare cotton for spinning, to more than 1,000 women.



Government of Benin and IFDC Sign a Memorandum of Understanding

On April 16, 2009, the Government of Benin and IFDC signed an MOU that provides a legal framework for IFDC's project activities in the country. The Minister of Foreign Affairs was represented by Mr. Desire Adadja, Minister of Communication and Information Technology. He stated, "The Benin Government considers IFDC a strategic ally in its efforts toward food security and poverty reduction.

"I would like to express the appreciation of President Boni Yayi and the Beninese people for the technical and financial support that IFDC brings to our national agricultural development efforts," Adadja said.

Signing on behalf of Dr. Amit Roy, IFDC's President and CEO, Dr. Marjatta Eilittä, Director of IFDC's North and West Africa Division, said, "I am convinced that this agreement will contribute to the achievement of the Green Revolution, which President Yayi has set as a top development priority."

From left, Dr. Marjatta Eilittä, Director of IFDC's North and West Africa Division, Benin's Ambassador to the U.S., Pascal Assogba Oude, and Mr. Desire Adadja, Minister of Communication and Information Technology, at the signing of an MOU providing the legal framework for IFDC's work in Benin.

Presenting IFDC's mission and its interventions in Benin, Eilittä said that current production levels in Benin do not provide an adequate supply of agricultural products for the country's population and emerging agro-industries. At the same time, without adding nutrients through fertilizers, soils are becoming increasingly exhausted due to continuous cultivation.

Eilittä reminded participants of the pledge of the African heads of states and governments during the June 2006 Africa Fertilizer Summit in Abuja to increase fertilizer consumption rates from the actual 8 kg/ha to 50 kg/ha by 2015. She stressed that meeting the numerous and complex challenges relating to production growth and the improvement of the production environment requires not only political will but concrete actions to ensure: strong and effective producers' organizations; efficient input distribution systems; accessible credits for farmers, traders, and processors; and coordination among all actors along the value chain to adapt production to market demand.

According to IFDC's representative in Benin, Gregoire Houngnibo, "IFDC is recognized in Benin as an expert in soil fertility management and cotton sector and input market development owing to its achievements and flagship activities.

"A good example is a 2005 IFDC study *L'Etat du Marché des Intrants Agricoles au Bénin* on input markets in Benin. This publication from MIR, a project that developed a regional input market (2003–2008), is a reference recommended by the World Bank and other key institutions in Benin," Houngnibo said.

"IFDC gained a great deal of visibility during the 2005 Cotton Conference for West and South Africa held in Cotonou. More than 150 international participants, including input distributors, cotton societies, and development professionals, met to discuss the challenges and prospects of the cotton sector," Houngnibo said.

"Through WACIP, selected Beninese artisans were trained in quality-enhancing techniques and innovative designs mainly for cotton table and bedding linens. There were $50,000 worth of orders from the United States and South Africa following the artisans' participation in the international trade fair organized by Aid to Artisans in New York and the International Artcraft Exhibition of Ouagadougou in Burkina Faso."

Representing the National Council of Agricultural Inputs Importers and Distributors of Benin, Nowan Yaya Adamon commended IFDC for its role in upgrading the professionalism of input distribution. "Today all development partners acknowledge the vital

Government of Benin and IFDC Sign a Memorandum of Understanding (continued)

role of the agricultural inputs sector to boost agricultural production," Adamon said. "Partnering with IFDC helps producer groups to know the needs and constraints and adjust distribution to the demand. Most of all, working with IFDC gives us more visibility among actual and potential clients and that is paramount for our business."

Gaston Dossouhovi, former Minister of Agriculture, who was present at the signing ceremony, said "IFDC is helping to find sustainable responses to the cotton crisis. This Agreement between the Beninese government and IFDC is the achievement of ongoing efforts since 2004. Those who played a role in the process are very pleased to see this day."

Minister Adadja concluded, "The signing of this agreement marks the beginning of a new partnership between IFDC and the Beninese Government. This partnership should focus on four strategic areas: agricultural reforms; access to agricultural inputs and supply systems; institutional development; and integrated soil fertility management."

IFDC in Action in Benin

Several IFDC projects in Benin have generated significant results, beginning when the 5-year Marketing Inputs Regionally (MIR) project opened in Cotonou in 2003. MIR focused on creating favorable conditions for transparent and efficient regional input markets in the 16 countries of the Economic Community of West African States (ECOWAS). This was done through exchange platforms, capacity building, and harmonization of national input regulations. Funded by DGIS, MIR has supported the Beninese Government in developing a legal framework for markets in fertilizers, seeds, and CPPs.

The MISTOWA project, funded by the USAID Regional Program for West Africa and the farmers' international organization AGRITERRA, expanded IFDC's intervention in Benin. The 3-year project began in 2004. MISTOWA's flagship activity was TradeNet, an Internet platform to facilitate and increase commercial transactions at the regional level. To date, 12 ABIPs operate in selected strategic locations where farmers and traders can access and post online offers and demands.

IFDC's 1000s+ project, which operates in seven West African countries including Benin, began in 2006 and runs through 2010. This innovative project, funded by DGIS, uses the "cluster approach" to boost agricultural productivity and increase farm household incomes, within the framework of a Strategic Alliance for Agricultural Development in West Africa. 1000s+ facilitates the development of the staple crop sectors (maize, maize/cassava, palm oil, cowpea, and groundnut) in line with Benin's national development objectives.

The Improving Cotton Productivity in the Districts of Banikoara and Klouékanmè in Benin project (2006–2008) was funded by the Netherlands Embassy to combat soil fertility decline in cotton-based production systems. The aim was to increase productivity and reduce poverty by diversifying agricultural production, promoting market opportunities, and developing linkages between producers, private entrepreneurs, and financial structures. IFDC's ISFM learning plots were planted in five pilot villages supported by activities to strengthen technical and managerial capacities and facilitate access to credit.

The Communal Forests Management Support Project (PAGEFCOM) in Benin is funded by the African Development Fund and the AfDB. PAGEFCOM is active in 15 of the 26 targeted districts and focuses on ISFM and the integration of agriculture, livestock, and agroforestry to reduce poverty and contribute to sustainable economic growth.

WACIP, funded by USAID, works with the governments of Benin, Chad, Mali, and Niger to develop policy reforms that create a favorable production environment. WACIP (2007–2010) focuses on increasing cotton productivity through ISFM and IPM, improving cotton quality, facilitating access to credit, and strengthening advocacy capacities of private producer and trader organizations to influence change.

According to Grégoire Houngnibo, Cotton Local Expert and IFDC's Representative - Coordinator in Benin, "IFDC's various projects in Benin support the government efforts to fight food insecurity and contribute to the regional economic integration promoted by ECOWAS and the West African Economic and Monetary Union [UEMOA]."

— Miscellaneous —

Retired Board Member Ruth Oniang'o Says "IFDC's Future is Already Here"

Professor Dr. Ruth Oniang'o retired early from IFDC's Board of Directors to devote herself to rebuilding the Rural Outreach Program (ROP), an NGO she founded in Kenya. The ROP Center was destroyed during civil unrest in Kenya last year.

What changes did you see at IFDC during your 7 years as a Board Member?

I have seen IFDC grow from a small organization to one that can compete with large international NGOs. I have seen IFDC assume a very important position in Africa's agriculture. The budget has grown. The governance and culture of the organization have remained uniquely strong.

How do you see IFDC's role in the future?

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

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

Regrettably, you have resigned from IFDC's Board of Directors; what are your plans for the future?

I left the Board prematurely to reorganize my NGO and to work more effectively with IFDC to fulfill its mandate. I want to spread good agricultural practices throughout East Africa. When I first joined the IFDC Board, I did not know much about fertilizer. As a food and nutrition scientist, I now compare the soil's need for fertilizer to the body's need for nutrients. We cannot be productive without nourishment. Likewise, soils cannot produce without inputs. African farmers do not use much fertilizer, yet African soils need fertilizer more than anywhere in the world. Working with the rural community over the past 18 years has taught me what poor farmers need—consistent technical support. Our center provided many needed veterinary services to about 400 women dairy farmers. Rebuilding the small milk processing plant, which produced yogurt, is essential to those farmers. ROP also helped food crop farmers. Recently, a widow told what ROP had done for her at a community meeting: "I thank you, ROP, for teaching me how to use inputs. Now my small plot produces eight bags of maize instead of the two that I produced without inputs."

ROP also operates early childhood development centers and provides services to orphans, widows, and the elderly. Needy students have also benefited from our scholarship fund.

How do you see Kenya's current situation in regard to farmers?

Kenya's post-election violence hit at the heart of farming in the Rift Valley and Western Province during land preparation time. The area was not cultivated and the farmers were in "internally displaced person" camps. Many still are. The few who planted did not use fertilizer for two reasons: fertilizer was not available because of the violence and fertilizer prices had skyrocketed worldwide. The planting time was over when the

fertilizer reached the farmers. The government promised to subsidize the inputs, but logistically it was impossible to move the inputs quickly from the Port of Mombassa to the other side of Kenya where they were needed most. It is therefore not surprising that food production for 2008 was estimated to be about 30% less than other years, and pockets of serious famine are being reported. The violence lasted for 2 months and showed us how vulnerable we are; we do not have food stocks to last a mere 2 months. We must employ modern farming methods, build our food reserves, and address the entire food chain through research, policies, and practical implementation. I will continue working with our farmers. After serving in Kenya's Parliament, I fully understand how policies can be influenced and I can work in that area to make improvements.

Interview with Dr. Vo-Tong Xuan, IFDC Board Member

Dr. Vo-Tong Xuan, President and Agronomy Professor, Angiang University, Vietnam, was named to the IFDC Board of Directors in October 2007. He has been called "Dr. Rice" because of his expertise in rice production in Vietnam's Mekong Delta. Xuan recently received the first-ever Umalie Award, given by the Southeast Asia Center for Graduate Study and Research in Agriculture to recognize individuals who have advanced agricultural development in Southeast Asia.

What was your role in Vietnam's remarkable increase in rice production since the late 1960s?
I taught at the University of Cantho in Vietnam, where I mobilized students to introduce better farm management practices to rural farmers. That included new, higher-yielding, short-duration rice varieties that were resistant to the brown planthopper, the most prevalent insect pest in the Mekong Delta. Students extended the new rice varieties and knowledge to farmers in areas where brown planthoppers were destroying the crops. Those farmers then became extension agents. We also used the popular radio show "Uncle Tam's Family" to tell farmers about new techniques to produce higher rice yields. This resulted in a still larger farmer extension network.

Farm plots in my country were assigned—not owned. At first, farmers were required to sell all of their rice production to the government. We revised the land law to encourage farmers to plant more and to manage the land better. I tested a "contract" system in which farmers could plant on their assigned plots instead of the collectivized farm and sell rice in the open market after they had sold the required amount to the state. The government implemented this contract system in 1981, and production increased by 33%.

A new land law was passed in 1988, allowing farmers to have land on a long-term contract. This encouraged farmers to manage their land more effectively because the government could no longer reassign it on a whim. In 1989, Vietnam began exporting rice. We exported 1.79 million metric tons, making Vietnam the world's third-largest rice exporter. Then we became the second-largest rice exporter. In 2008, Vietnam exported 4.8 million metric tons.

Vo-Tong Xuan (right), IFDC Board Member, and farmer Vo Van Triem (left) inspecting Triem's rice field in An Giang Province, Vietnam.

What do you think IFDC's role in global food security should be?

IFDC should strongly communicate how to use fertilizer more efficiently.

High production costs are making it very difficult for farmers to increase their income. Farmers often use too much fertilizer, or the wrong type of fertilizer, which not only cuts profits but also harms the environment. Many rural growers do not have the right technology or know the right planting procedures.

IFDC should conduct research to increase the efficiency of fertilizer use in major crops like rice, cassava, sugarcane, and maize. Agricultural technologies like urea deep placement should be extended to farmers. Extension can be done very efficiently through universities.

What is your vision of transferring Mekong Delta rice technology to the river deltas of West Africa?

I'm optimistic about south-south cooperation in which Vietnamese scientists and farmers would share agronomic techniques with counterparts in Africa. We are not afraid of getting muddy. If African farmers can see what Vietnamese farmers have done, they'll know that they can do it too.

What is your vision of fertilizer research in the future?

Fertilizer research is crucial, but it has been neglected in the past. We should guide farmers not only to use mineral fertilizers more efficiently but also to combine them with organic fertilizers.

Monsanto Announces $10-Million Beachell-Borlaug Scholarship To Honor Pioneer Rice and Wheat Plant Breeders

Leaders in global food security, including former U.S. Senator George McGovern—the 2008 World Food Prize Laureate—joined Nobel Laureate Dr. Norman E. Borlaug and his family to celebrate Borlaug's 95th birthday on March 25 in Dallas, Texas, United States.

During the event, Monsanto Company announced a $10-million grant to establish its *Beachell-Borlaug International Scholars Program.* The scholarships will "support young scientists interested in improving research and production in rice and wheat, two of the world's most important staple crops, through plant breeding techniques," according to a Monsanto press release.

The Beachell-Borlaug scholarships honor pioneer plant breeders Dr. Henry "Hank" Beachell and Borlaug.

Beachell shared the 1996 World Food Prize for his role in developing IR8, the first high-yielding semidwarf rice variety to be widely grown in the tropics. At that time, Beachell was a plant breeder at the International Rice Research Institute (IRRI) in the Philippines. IR8 is credited with triggering the Green Revolution in Asian rice farming.

Borlaug is known as the "father of the Green Revolution" for his development of the improved wheat varieties that spread rapidly throughout Asia, Latin America, and the Near and Middle East. He was then working with a Rockefeller Foundation program that became the International Maize and Wheat Improvement Center (CIMMYT) in Mexico.

Borlaug was awarded the 1970 Nobel Peace Prize for his contributions to world food security. He also received the Congressional Gold Medal of Honor—the highest civilian honor in the United States—in 2006.

Borlaug served on the IFDC Board of Directors from 1994 to 2003.

Africa Division Holds Staff Retreat in Ghana

Fifty-two staff members participated in the first IFDC Africa Division Staff Retreat Oct. 21–23, 2008, in Sogakope, Ghana.

The IFDC Africa Division was established in 1987 in Lomé, Togo. Since the meeting IFDC has reorganized, creating the North and West Africa Division (NWAFD) and the East and Southern Africa Division (ESAFD). IFDC staff from the two divisions work in 17 African countries.

"There was an increasing need for the staff to come together to take stock of our progress and look to the future," says Robert Groot, who at the time of the meeting was Director of the Africa Division and is now Director of IFDC's East and Southern Africa Division.

The main objectives were to reflect on implications of IFDC's 2009–13 strategy on field programs and on IFDC's strengths and weaknesses in West Africa, Groot says. Other objectives were to develop recommendations for implementation of IFDC's new strategy and to foster team spirit.

2007—IFDC Staff Members Receive Awards

Chairman's Outstanding Internationally Recruited Staff Award

The 2007 winner of this award is **Dr. Arno Maatman**, **former Chief of Party for SAADA and IFDC's Representative in Mali**. Arno, nominated by his colleagues on the SAADA and WACIP projects, demonstrated outstanding service and dedication to IFDC's purposes, said Dr. Amit Roy, IFDC CEO. An economist and mathematician, Arno is an expert in rural development, using participatory approaches based on solid economic and market theories. He and his team developed the CASE approach, which is a cornerstone of IFDC work in Africa. The CASE approach has allowed IFDC to work with thousands of producers, doubled production, and increased family income by 30% to 50%. Known as a team player, Arno has the ability to inspire his colleagues to work hard to achieve IFDC's goals. He was the first staff member to introduce the gender approach in IFDC activities in Africa and worked to achieve gender balance in his own team. He is also an expert on HIV/AIDS and its relationship to agricultural development. It is often said that "linking farmers to markets" is the key to agricultural development and through Arno's approach and leadership, IFDC has made that happen. His work has had a measurable impact on the lives of African farmers.

President's Outstanding Outposted Staff Award

Mofizul Islam, Senior Agriculture Specialist in Bangladesh, is the 2007 winner. Mofiz has been with IFDC for more than 20 years and has been an integral part of IFDC work in Bangladesh. He has managed hundreds of training programs under the Fertilizer Distribution Improvement II project. He pioneered the introduction of hybrid maize cultivation practices in Bangladesh. Under ANMAT I and II, Mofiz took the lead in widescale introduction of UDP technology where it is popularly known as "IFDC technology." He worked hard to get the word out about UDP, using television and other media, and convinced the Minister of Agriculture that this technology was right for Bangladesh. He has excellent "people skills" and works in the field with farmers, teaching them through practical demonstration. He strongly believes in IFDC's mission, which is to improve agricultural practices and help farmers.

President's Outstanding Headquarters Staff Member Award

The 2007 winner of the President's Outstanding Headquarters Staff Member Award is **Donna Venable, IFDC's Coordinator—Word Processing/Graphics**. Donna has been at headquarters for 30 years and is known for her strong work ethic, her creative graphic work on IFDC publications, and her dedication to excellence. She has high standards and her work is excellent. She was nominated by her co-workers who know that Donna is always willing to lend a hand and help meet a pressing deadline. She has made many contributions to IFDC programs through published documents. She turns out beautiful work in the Corporate Report, the President's Report, quarterly newsletters, brochures, calendars, training materials, and other publications. She is one of the people "behind the scenes" at headquarters who does much to focus attention on IFDC's work and mission worldwide.

The 2007 IFDC Staff Member Award winners were inadvertently left out of the 2007/08 Corporate Report. IFDC wants to be sure that the awardees receive the recognition they deserve.

2008—IFDC Staff Members Receive Awards

The Chairman's Outstanding Internationally Recruited Staff Member Award

The 2008 recipient of the IFDC Chairman's Outstanding Internationally Recruited Staff Member Award is **Ishrat Jahan, Resident Representative of IFDC's Asia Division**. Ishrat is an economist with more than 20 years of experience in policy development. Based in Dhaka, Bangladesh, Ishrat has been instrumental in expanding IFDC activities—especially UDP—to farmers across the country. Ishrat was key in helping organize a UDP media campaign to show farmers the benefits of using the new technology. About 400,000 Bangladeshi farmers now use UDP in districts where IFDC is implementing the new project.

Ishrat (right) in the field explaining the benefits of UDP.

Ishrat demonstrates a dedicated work ethic, leadership, and innovation, as well as expertise in agribusiness, marketing, public relations, and communication at all levels. Her success in fostering collaborative relationships among IFDC, the Government of Bangladesh, and the donor community has been invaluable to Bangladeshi farmers.

Ishrat, a Bangladeshi citizen, earned a B.A. and an M.A. in economics from the University of Dhaka in Bangladesh and an M.S. in agricultural economics from the University of the Philippines at Los Baños.

The President's Outstanding Outposted Staff Member Award

Marie Claire Kalihangabo is the 2008 recipient of the President's Outstanding Outposted Staff Member Award. She was formerly the Office Manager for the Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability (CATALIST) project, based in Kigali, Rwanda. She is now the **CATALIST Regional Administrator and Finance Officer**. Marie Claire works to support the CATALIST technical staff by providing them with a productive working environment. She also ensures that all financial transactions are accurate and transparent.

Marie Claire accepting her award.

Marie Claire is a valuable information source on project activities and interactions with stakeholders. She has a strong sense of responsibility and pride in her work and recognizes and appreciates IFDC's efforts to improve the lives of her countrymen and neighbors in surrounding Great Lakes countries.

Marie Claire, a Rwandan citizen, received a B.S. in management from the National University of Rwanda in Butare.

The President's Outstanding Headquarters Staff Member Award

The 2008 recipient of the President's Outstanding Headquarters Staff Member Award is **Lisa Thigpen, IFDC Editor.** Lisa edits IFDC documents with care and precise attention to detail. She also writes outstanding articles for IFDC newsletters, corporate reports, and press releases, always looking for the "human" side of a story. Her main concern is to make IFDC staff, and IFDC itself, communicate clearly and concisely.

Lisa editing manuscripts at IFDC headquarters.

Lisa genuinely cares about the people she works with as well as IFDC's ultimate clients: smallholder farmers, input dealers, and researchers in the world's poorest countries. Lisa's hard work and dedication to editorial quality help improve IFDC's image worldwide. Lisa represents the dedication and professionalism of so many quiet IFDC specialists whose contributions are crucial to helping IFDC meet the world food crisis.

Lisa is a U.S. citizen. She earned a B.S. in English from the University of North Alabama, United States.

Project Portfolio

Project	Objective	Collaborators	Location
Afghanistan Water, Agriculture, and Technology Transfer (AWATT)	To employ technology in resource conservation and risk management to improve Afghanistan's agricultural sector	USAID, New Mexico State University, Southern Illinois University, Colorado State University, and University of Illinois at Urbana – Champaign, farmers, agro-dealers	Afghanistan
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
Agro-Dealer Development in Mozambique	To train and network 600 agro-dealers and stockists in both the public and private sectors in Manica and Tete provinces	AGRA, agro-dealers	Mozambique
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
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, NGOs, national agricultural research and extension systems, credit sources, farmer organizations	Sub-Saharan Africa, West Africa
Commercial Development of Farmer-Based Organizations (CDFO)	To train members of farmer-based organizations in commercial agriculture, to improve access to irrigation facilities to enhance production, and to improve post-harvest handling and value-chain services	Adventist Development and Relief Agency, ACDI/VOCA, MASDAR International Consultants, MCC, Millennium Development Authority, farmer organizations	Ghana
Communal Forests Management Support Project (PAGEFCOM)	To facilitate sustainable agricultural intensification, with a special focus on ISFM and integration of agriculture, livestock, and agroforestry	African Development Fund, AfDB, Benin Ministry of Agriculture, farmers	Benin
Emergency Initiative to Boost Rice Production	To increase total domestic rice production by 30,000 mt and to strengthen farmers' access to certified seeds and fertilizers	USAID, Africa Rice Center, Catholic Relief Services, Savannah Agriculture Research Institute	Ghana, Senegal, Nigeria, and Mali
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 CRIG	Ghana
Expansion of UDP Technology in Additional 80 Upazilas of Bangladesh	To increase farmers' incomes by reducing their cost of production and simultaneously increasing their productivity per unit of land area during the Boro season through UDP	DAE, Government of Bangladesh, Ministry of Agriculture, rice farmers	Bangladesh
Extending Agro-Input Dealer Networks (EADN)	To help smallholder farmers improve economic returns from agriculture by improving their access to modern production technologies and yield-enhancing inputs such as fertilizers, improved seeds, and CPPs	IFAD, agro-dealers, farmers	Kenya, Uganda, and Tanzania
Fertilizer and Improved Seed Market Development Program – Purchasing Power Support to Farmers Through Input Vouchers	To provide purchasing power support to smallholder farmers to promote input use	FAO, USAID, GRM, agro-dealers, bankers, and farmers	Mozambique

Project	Objective	Collaborators	Location
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, Togo, Niger
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 MAIL	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, Association and Business Management Center, and banks	Albania
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 SAADA	Agribusiness clusters, producer organizations, business support services,	Burkina Faso, Ghana, Mali, Niger, Nigeria, Togo
Ghana Agro-Dealer Development (GADD)	To increase agricultural productivity and incomes of 850,000 smallholder farmers across Ghana by increasing the availability and affordability of quality agri-inputs, especially seeds, fertilizers, and CPPs, through efforts focusing on 2,200 agro-dealers	AGRA, GAABIC, agro-dealers, farmers	Ghana
Impact of Urea Deep Placement (UDP) in Bangladesh	To train extension workers and farmers in UDP technology. To train people in the manufacture of urea briquettes	Bangladesh DAE, rice farmers, urea briquette manufacturers	Bangladesh
Improved Livelihood for Sidr-Affected Rice Farmers (ILSAFARM)	To help restore rice production by bringing UDP to 280,000 farm families in areas affected by Cyclone Sidr	USAID, DAE, Government of Bangladesh, Ministry of Agriculture, farmers, urea briquette producers	Bangladesh
Improving Cotton Productivity in the Districts of Banikoara and Klouékanmé	To combat soil fertility decline in cotton-based production systems and to increase productivity and reduce poverty through diversifying agricultural production, promoting market opportunities, and developing linkages among producers, private entrepreneurs, and financial structures	The Netherlands Embassy, farmers	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, United States
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	Forum for Agricultural Research in Africa	West African Savannah Zone
Innovative Fertilizers for Peri-Urban Farmers in Sub-Saharan Africa	To increase vegetable production and quality in peri-urban farming systems	SAADA, Stockholm Environmental Institute, IFAD, agri-input dealers, farmer organizations, and extension services	Bujumbura, Burundi; Accra, Ghana; and Kigali, Rwanda
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

Project	Objective	Collaborators	Location
Kyrgyz Agro-Input Enterprise Development Project (KAED II)	To support the development of agri-input dealers and increase agricultural production through the use of improved technologies	Agri-input dealers, decision makers	Kyrgyzstan
Livelihoods and Enterprises for Agricultural Development (LEAD)	To improve the performance of the input value chain, focusing on strengthening the capacities of agro-dealers	ARD, Inc., agro-dealers	Uganda
Maize Intensification in Mozambique (MIM)	To help smallholder farmers intensify maize production through increased fertilizer use and to strengthen the entire value chain by linking farmers with agri-input suppliers and traders	International Maize and Wheat Improvement Center, marketing companies, NGOs, and farmer and producer organizations	Mozambique
Marketing Inputs Regionally (MIR Plus)	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
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
Nigeria Agro-Input Dealer Support (NADS)	To support 1,400 agro-dealers in order to foster an increase in agricultural productivity, incomes, and well-being of 1,050,000 rural smallholder farmers by increasing the availability, accessibility, and affordability of seeds and other quality agri-inputs in rural areas	AGRA, Fertilizer Producers and Suppliers Association of Nigeria, agro-dealer associations, agro-dealers, farmers	Four states in Nigeria
Rural Development Support Program (PADER)	To facilitate sustainable agricultural intensification, with a special focus on ISFM and integration of agriculture	IFAD, farmers, extension services	Benin
Southeast Climate Consortium Project	To develop a climate information and decision support system for the southeastern United States 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	United States
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
Strengthening Trade at the Regional Level (STAR)	To promote agricultural growth through improved regional trade in inputs	COMESA, EAC, SADC	Eastern and southern Africa
Sustainable Energy Production Through Woodlots and Agroforestry in the Albertine Rift (CATALIST-SEW)	To decrease competition for land use between energy and agricultural production by increasing wood production, agricultural productivity, and incomes	World Wildlife Fund-Belgium, regional NGOs, wood and charcoal producers, transporters, and traders	Burundi, with posted staff in Goma, DRC and Kigali, Rwanda
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

Publications and Major Presentations, 2008/09

Publications

FSR-1 *Africa Fertilizer Situation.*

FSR-2 *Asia Fertilizer Situation.*

FSR-3 *Latin America 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-19 *Former Soviet Union (FSU) 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-31 *IFDC Corporate Report 2007/2008*.

T-73 *Agroecological Principles of Integrated Soil Fertility Management—A Guide With Special Reference to Sub-Saharan Africa*.

Chien, S. H., E. R. Austin, and C. G. Calvo. 2009. "Underestimation of Available Phosphorus by Resin-Bicarbonate and Olsen Tests in Calcareous Soils Treated with Gypsum," *Communications in Soil Science and Plant Analysis*, 40.

Crawford, Jr., T. W., U. Singh, and H. Breman. 2008. *Solving Agricultural Problems Related to Soil Acidity in Central Africa's Great Lakes Region.* IFDC, Kigali, Rwanda.

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.

Roy, A. 2008 "Fertilizer: A Key to Achieving Food Security and Cutting Poverty," Paper presented at the 53rd Annual Safety in Ammonia Plants and Related Facilities Symposium, San Antonio, Texas, U.S.A., Sept. 9–11, 2008.

Major Presentations

Bumb, B. 2009. "Challenges in Developing Agricultural Input Markets in Africa," Presentation at the Second Regional Training Workshop and Policy Seminar of the Africa Agricultural Markets Program, Livingston, Zambia, June 14–18, 2009.

Bumb, B. 2009. "The Silent Tsunami: Lessons from the 2008 Global Fertilizer Crisis," Presentation at a seminar for FAO staff, Rome, Italy, June 2009.

Bumb, B., and J. Mathende. 2009. "Fertilizer Joint Procurement: Issues and Options," Presentation at the COMESA Fertilizer Symposium, June 15–17, 2009.

Roy, A. "Soil Health for Sustainable Food Security: Issues and Options," Presentation at the M.S. Swaminathan Research Foundation, Chennai, India, April 6, 2009.

Roy, A. 2008. "Managing Access to Farm Inputs," Presentation at the World Bank's Awards Ceremony of the Development Marketplace, Washington, D.C., U.S.A., Sept. 26, 2008.

Roy, A. 2009. "Global Fertilizer Situation and Fertilizer Access," Presentation at the World Bank's 2009 Agriculture and Rural Development Week, Washington, D.C., U.S.A., March 3–5, 2009.

Roy, A. 2009. "The Food, Fuel, and Fertilizer Nexus," Presentation at the Gulf Petrochemicals and Chemicals Association Committee on Fertilizers, Dubai, United Arab Emirates, April 8, 2009.

Van Kauwenbergh, S. 2009. "Fertilizer Products – Types and Characteristics," Presentation at the HME and CGE Mitigation Seminar, Virginia, U.S.A., June 16, 2009.

Wanzala-Mlobela, M. 2009. "Implementation of the Abuja Declaration on Fertilizer for an African Green Revolution: A Progress Report," Presentation at the East and Southern African Regional Consultative Meeting on the Establishment of the African Regional Fertilizer Procurement Facility, Nairobi, Kenya, March 13–14, 2009; at the IFA Africa Forum Meeting, June 10–11, 2009, Durban, South Africa; and at the Second Regional Training Workshop and Policy Seminar of the Africa Agricultural Markets Program, Livingston, Zambia, June 14–18, 2009.

Wilkens, P. 2009. "Agriculture in Afghanistan – An IFDC Perspective," Presentation at the HME and CGE Mitigation Seminar, Virginia, U.S.A., June 16, 2009.

Wilkens, P. 2009. "Urea Deep Placement in Bangladesh – Technology Impacting the Environment and Sustainability," by Diamond, R., W. Bowen, and P. Wilkens. Presentation at the Universiti Kebangsaan Malaysia Workshop on Climate Change, Agricultural and Food Production Issues, Bangi Selangor, Malaysia, April 2009.

Wilkens, P., G. Googenboom, U. Singh, and J. Koo. 2009. "Regional Crop Modeling: Integrating the CSM Model in a GIS," Presentation at the 39th Biological Systems Simulation Conference: Simulation of Food, Feed, Fiber, and Fuel Production Systems in the 21st Century, Griffin, Georgia, U.S.A., May 11–13, 2009.

Financial Highlights

The following is a summary of financial information for the year ended December 31, 2008. The full financial statements and the independent auditors' reports are available from IFDC upon request.

Balance Sheet

For the year ended December 31, 2008

	US $'000
Assets:	
Cash and cash equivalents	8,510
Restricted cash	2,297
Contribution receivable	1,040
Contracts receivable, net of allowance for doubtful accounts	2,246
Other receivables	272
Supplies inventory	125
Prepaid expenses and advances	1,106
Total current assets	15,596
Buildings and equipment, net	122
Contributions receivable, noncurrent	
Total assets	15,718
Liability and Net Assets:	
Accounts payable	416
Accrued annual and sick leave	1,033
Deferred revenue	9,961
Other liabilities	2,297
Total current liabilities	13,707
Unrestricted net assets	2,003
Permanently restricted net assets	8
Total liabilities and net assets	15,718

Statement of Revenue and Expenses

For the year ended December 31, 2008

	US $'000
Revenue and Support:	
Agriterra	691
Alliance for a Green Revolution in Africa	716
Chemonics International Inc.	478
Dutch Embassies	7,621
Government of Bangladesh	719
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)	999
International Fertilizer Industry Association	170
International Fund for Agricultural Development	368
International Institute of Tropical Agriculture	412
Millennium Development Authority	898
Netherlands Minister for Development Cooperation (DGIS)	5,605
The Fertilizer Institute	126
The Rockefeller Foundation	106
The William and Flora Hewlett Foundation	590
Shell Canada Limited	2,155
U.S. Agency for International Development	9,056
U.S. Department of Agriculture	2,797
Others	2,329
Total revenues and support	35,836
Expenses:	
Field programs	19,036
Research and market development	13,839
Support activities	3,046
Total expenses	35,921
Decrease in unrestricted net assets	**(85)**

Revenue Sources

African Development Bank
AGROGEN, S.A. de C.V.AGROGEN, S.A. de C.V.
Agriterra
Agrium Inc.
Agrotain International L.L.C.
Alliance for a Green Revolution in Africa (AGRA)
ARD, Inc.
Chemonics International, Inc.
Common Fund for Commodities
CORAF/WECARD, Senegal
Croplife Africa Middle East (CLAME)
Development Alternatives, Inc. (DAI) – Afghanistan
Deepak Fertilizers and Petrochemical Corporation Ltd.
Dutch Foundation for the Advancement of Tropical Research (WOTRO)
Esoko Networks Ltd.
Food and Agriculture Organization (FAO)
Forum for Agricultural Research in Africa (FARA)
Georgia Pacific Resins, Inc.
Government of Bangladesh
Government of Burkina Faso
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.
Jacobs Engineering
J.R. Simplot
Le Programme Diversification et Compétitivité Agricoles (PCDA)
Millennium Development Authority (Ghana)
Nagarjuna Fertilizers and Chemicals Limited
National Programme for Food Security – Nigeria
Netherlands Ministry for Development Cooperation (DGIS)
New Mexico State University
Projet d'Appui à la Gestion de Forêts Communales (PAGEFCOM) – Government of Benin
Royal Netherlands Embassies in Rwanda, Benin, and Ghana
Shell Canada Energy
The African Rice Center (WARDA)
The Fertilizer Institute (TFI)
The Sulphur Institute
United States Agency for International Development (USAID)
United States Department of Agriculture (USDA)
Unity Envirotech
University of Georgia
University of Missouri
William and Flora Hewlett Foundation

Global Offices and Staff (as of June 30, 2009)

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Cynthia A. McComas, Senior Secretary
Debra E. Rutland, Executive Secretary

Operations Division

Charles W. Snipes, Director
Kaye F. Barker, Senior Budget/Procurement Officer
Charles E. Butler, Technician – Maintenance Services[4]
Doyce E. Couch, Coordinator – Maintenance Services
C. David Edwards, Senior Personnel Officer
Ronnie L. Faires, Senior Purchasing Officer
Amber N. Hammock, Senior Secretary/Associate Personnel Officer
Christopher B. Holt, Associate Budget Officer
Nell R. McGee, Accountant
Bethany A. Morris, Accountant
Kathy J. Pannell, Secretary
Brenda G. Peden, Receptionist
Wendell C. Rhodes, Senior Technician – Maintenance Services
Leslie K. Richardson, Associate Accountant
Juanita L. Schultz, Accountant
Debra S. Shedd, Supervisor – Accounting Services
Kasta L. Staggs, Associate Accountant
Michael O. Thompson, Senior Visitor Relations Officer
Xia Wan, Coordinator – Computer Services
David B. Wright, Senior Technician

Information and Communications Unit

Scott Mall, Coordinator
Thomas R. Hargrove, Coordinator[2]
Cheryl W. Bennett, Librarian
Jane L. Goss, Senior Word Processor
Vickie J. Hollandsworth, Senior Word Processor[4]
Julie D. Kohler, Word Processor
Lisa L. Thigpen, Editor
Donna W. Venable, Coordinator – Word Processing/Graphics
Courtney B. White, Editor

Research and Development Division

John T. Shields, Interim Director
Price D. Abernathy, Technician – Pilot Plant Services
E. Rick Austin, Coordinator – Analytical Services
Janice T. Berry, Coordinator – Market Information Unit
Wendie D. Bible, Senior Analyst – Laboratory
Bobby W. Biggers, Senior Technician – Pilot Plant Services/Physical Properties
Robert C. Bosheers, Coordinator – Greenhouse and Pilot Plant Services
Danny M. Brown, Analyst – Laboratory
Balu L. Bumb, Principal Scientist and Program Leader – Policy, Trade, and Markets Program
Celia J. Calvo, Senior Analyst – Laboratory
Oumou M. Camara, Scientist – Economics
Omprakash Choudhury, Specialist – Engineering
Adam C. Crosswhite, Technician – Pilot Plant Services
Luisa M. De Faría, Specialist – Engineering
Thomas E. Evers, Senior Technician – Pilot Plant Services
Porfirio A. Fuentes, Senior Scientist – Economics (Trade)
Job Fugice, Jr., Analyst – Laboratory
Robert P. Gray, Specialist – Engineering
Deborah T. Hellums, Coordinator – Field Projects
Vaughn K. Henry, Senior Technician – Greenhouse Services
Brandon S. Holaway, Technician – Pilot Plant Services
Andrea D. Hovater, Specialist – Engineering
Phillip G. Humphres, Senior Specialist – Engineering
Christopher A. James, Analyst – Laboratory
Deborah B. King, Senior Secretary
Steven P. Kovach, Program Leader – Soil and Nutrient Dynamics Program[1]
J. Ramón Lazo de la Vega, Senior Specialist – Engineering
Paul K. Makepeace, Senior Scientist – Marketing
Benjamin C. Malone, Jr., Senior Analyst – Laboratory[4]
H. Resha McCarley, Secretary
Jan J. Nijhoff, Senior Scientist – Economics (Trade)[1]
James Rea Phyfer, Technician – Pilot Plant Services
Flavia Rey de Castro, Associate GIS Specialist
Henry Russaw, Jr., Technician – Pilot Plant Services
Lindsey N. Ryan, Analyst – Laboratory[1]
Yashpal S. Saharawat, Postdoctoral Scientist – Social Science/Agronomy[1]

1. Left during 2008/09.
2. Retired during 2008/09.
3. Short-term staff 2008/09.
4. On extended leave.
5. Deceased 2008/09.
6. Student Attachment.

Joaquin Sanabria, Scientist – Biometrician
Har Bhajan Singh, Senior Specialist – Marketing[2]
Upendra Singh, Senior Scientist – Systems Modeling (Soil Fertility)
G. Ronald Smith, Senior Technician – Greenhouse Services
Thomas P. Thompson, Senior Scientist – Sociology
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Arsen Aslanov, Business Development Specialist
Daniya Baisubanova, Media/Public Relations Specialist
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Djihongir Djumabaev, Training Specialist
Alisher Kasymov, General Manager
Maksatbek Mamtibekov, Livestock Nutritionist
Jyrgal Musaev, Agronomist/Extension Specialist
Jyldyz Niyazalieva, Public Relations Assistant

1. Left during 2008/09.
2. Retired during 2008/09.
3. Short-term staff 2008/09.
4. On extended leave.
5. Deceased 2008/09.
6. Student Attachment

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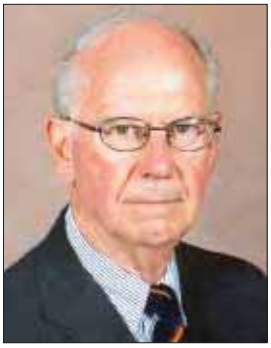

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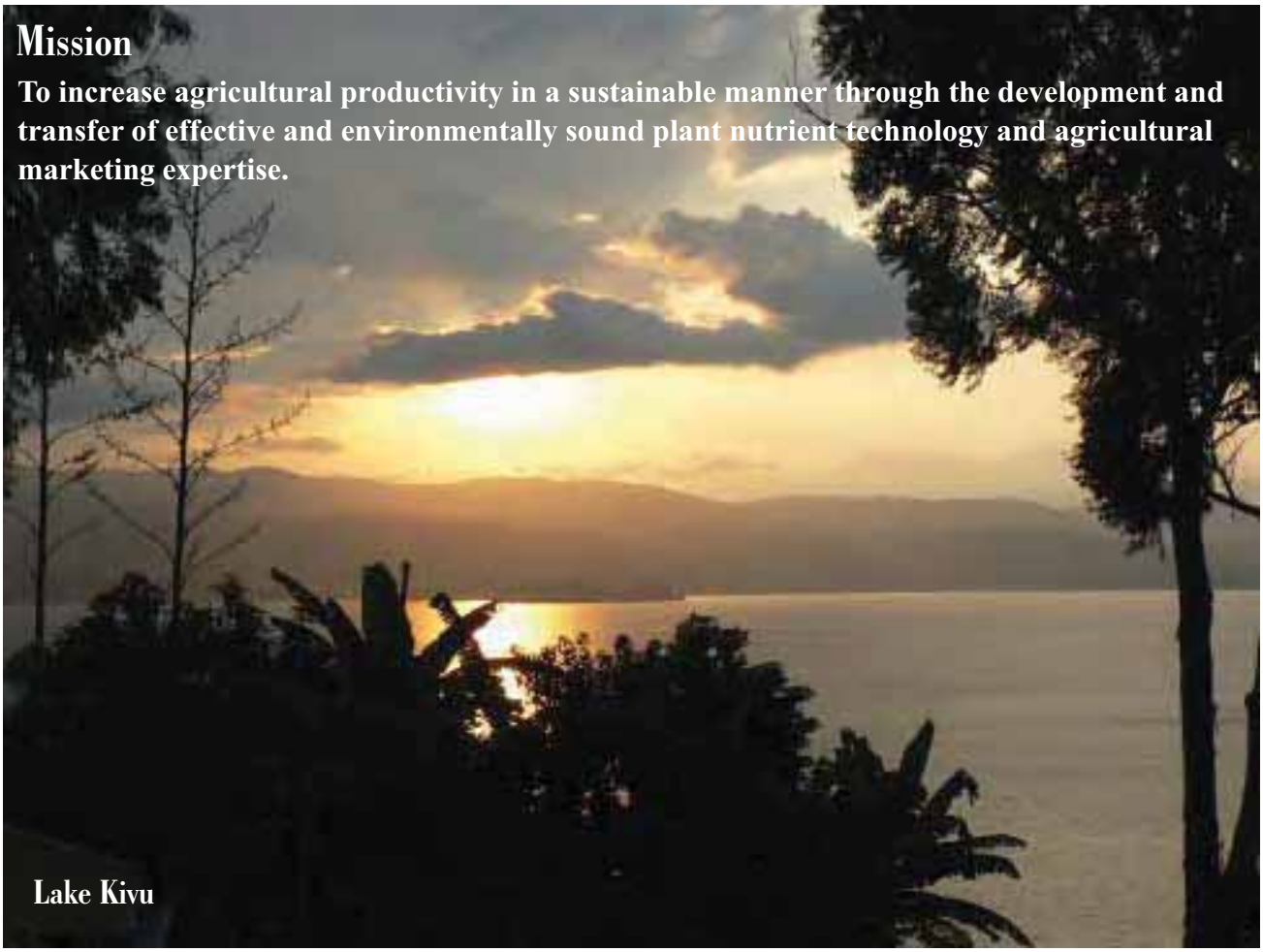
IFDC Profile

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:
  - → Development of food security
  - → Creation of agricultural sustainability
  - → Alleviation of global poverty
  - → Promotion of economic development
  - → Reduction in 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.



Lake Kivu

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 35-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 international agricultural research centers, 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 88.

IFDC An International Center for Soil Fertility and Agricultural Development

Acronyms

1000s+ ---------- From Thousands to Millions
AAK ---------- Association of Agribusinessmen of Kyrgyzstan
ABIP ---------- Agribusiness Information Point
ACDI/VOCA ---- Agricultural Cooperative Development International/Volunteers in Overseas Cooperative Assistance
AfDB ---------- African Development Bank
AFFM ---------- Africa Fertilizer Financing Mechanism
AGRA ---------- Alliance for a Green Revolution in Africa
AIMS ---------- Agricultural Input Markets Strengthening
AISSA ---------- Agricultural Intensification in Sub-Saharan Africa
AMPIA ---------- Associacao Mocambicana de Provedores de Insumos Agropecuarios
ANGRAU ------- Acharya N.G. Ranga Agricultural University
ASP ---------- Africa Stockpile Program
AUC ---------- African Union Commission
AWATT ---------- Afghanistan Water, Agriculture, and Technology Transfer
Bt ---------- Biotechnology
C-4 ---------- Cotton-4
CAA ---------- Cocoa Abrabopa Assocation
CAADP ---------- Comprehensive Africa Agriculture Development Program
CARDI ---------- Caribbean Agricultural Research and Development Institute
CASE ---------- Competitive Agricultural Systems and Enterprises
CATALIST ------ Catalyze Accelerated Agricultural Intensification for Social and Environmental Stability
CDFO ---------- Commercial Development of Farmer-Based Organizations
CEO ---------- Chief Executive Officer
CET ---------- Common External Tariff
CIAT ---------- International Center for Tropical Agriculture
CIP ---------- Crop Intensification Program (Rwanda)
COMESA -------- Common Market for Eastern and Southern Africa
CPP ---------- Crop Protection Product
CRIG ---------- Cocoa Research Institute of Ghana
CSD-ISFM ------ Combating Soil Fertility Decline to Implement Smallholder Agricultural Intensification
DAE ---------- Department of Agricultural Extension (Bangladesh)
DAP ---------- Diammonium Phosphate
DGIS ---------- Directorate-General for Development Cooperation (The Netherlands)
DRC ---------- Democratic Republic of Congo
DSSAT ---------- Decision Support System for Agrotechnology Transfer
EAC ---------- East African Community
EADN ---------- Extending Agro-Input Dealer Networks
ECOWAS -------- Economic Community of West African States
ESAFD ---------- East and Southern Africa Division
F&SAD ---------- Fertilizers and Sustainable Agricultural Development

Acronyms

FAO ---------- Food and Agriculture Organization of the United Nations
FARMS ---------- Food for Agricultural Revitalization and Market Systems
FFP ---------- Food For Progress
GAABIC --------- Ghana Agricultural Associations Business and Information Center
G-8 ---------- Group of 8 (Canada, France, Germany, Italy, Japan, Russia, United Kingdom and the United States)
GADD ---------- Ghana Agro-Dealer Development Project
GIS ---------- Geographic Information System
GRM ---------- Government of the Republic of Mozambique
ha ---------- hectare
IFA ---------- International Fertilizer Industry Association
IFAD ---------- International Fund for Agricultural Development
IFDC ---------- An International Center for Soil Fertility and Agricultural Development
IFPRI ---------- International Food Policy Research Institute
ILSAFARM ----- Improved Livelihood for Sidr-Affected Rice Farmers
IPM ---------- Integrated Pest Management
ISFM ---------- Integrated Soil Fertility Management
KAED ---------- Kyrgyz Agro-Input Development
LEAD ---------- Livelihoods and Enterprises for Agricultural Development
MAIL ---------- Ministry of Agriculture, Irrigation, and Livestock (Afghanistan)
MARKETS ------ Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites
MCC ---------- Millennium Challenge Corporation
MDG ---------- Millennium Development Goal
MIM ---------- Maize Intensification in Mozambique
MINAGRI ------- Ministry of Agriculture, Livestock, and Forestry (Rwanda)
MIR ---------- Marketing Inputs Regionally
MISTOWA ------ Strengthening Regional Networks of Market Information Systems and Traders Organizations in West Africa
MOU ---------- Memorandum of Understanding
mt ---------- metric ton
NADS ---------- Nigeria Agro-Input Dealer Support
NAFCON -------- National Fertilizer Company of Nigeria
NARI ---------- National Agricultural Research Institute
NEPAD ---------- New Partnership for Africa's Development
NGO ---------- Nongovernmental Organization
NPK ---------- Nitrogen, Phosphorus, Potassium
NuMaSS --------- Nutrient Management Support System
NWAFD ---------- North and West Africa Division
PADER ---------- Rural Development Support Program
PAGEFCOM ---- Communal Forests Management Support Project
PEDSA ---------- Strategic Plan for the Agriculture Sector (Mozambique)
RECs ---------- Regional Economic Communities

Acronyms

ROP ---------- Rural Outreach Program
SAADA ---------- Strategic Alliance for Agricultural Development in Africa
SADC ---------- Southern African Development Community
SEW ---------- Sustainable Energy Production Through Woodlots and Agroforestry in the Albertine Rift
STAR ---------- Strengthening Trade at the Regional Level in Agricultural Inputs in Africa
ToT ---------- Training of Trainers
TSBF ---------- Tropical Soil Biology and Fertility Institute
UDP ---------- Urea Deep Placement
UEMOA --------- West African Economic and Monetary Union
UN ---------- United Nations
USAID ---------- United States Agency for International Development
USDA ---------- United States Department of Agriculture
WACIP ---------- West African Cotton Improvement Program

— IFDC Photo Gallery —

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