IFDC

A QUARTERLY MAGAZINE

Volume 39, Number 2 • 2014 • An update on the work and progress of IFDC

The New Age of Agricultural Development in Africa

- Model Villages in Bangladesh
- Ethiopia Builds Agriculture Sector

IFDC *Quarterly Magazine*

IFDC is a public international organization, governed by a board of directors with representation from developed and developing countries. The nonprofit Center is supported by various bilateral and multilateral aid agencies, private foundations and national governments. IFDC focuses on increasing and sustaining food security and agricultural productivity in developing countries through the development and transfer of effective and environmentally sound crop nutrient technology and agribusiness expertise.

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FREQUENTLY USED ACRONYMS

2SCALE: Toward Sustainable Clusters in Agribusiness through Learning in Entrepreneurship
AAPI: Accelerating Agriculture Productivity Improvement
AIMS: Agricultural Input Markets Strengthening
AU: African Union
BAU: Bangladesh Agricultural University
BRRI: Bangladesh Rice Research Institute
CAADP: Comprehensive Africa Agriculture Development Programme
DRC: Democratic Republic of the Congo
DSSAT: Decision Support System for Agro-Technology Transfer
ECOWAS: Economic Community of West African States
EDF: Economic Development Fund
FAO: Food and Agriculture Organization of the United Nations
FDP: fertilizer deep placement
GDP: gross domestic product
GHG: greenhouse gas
ha: hectare
IFAD: International Fund for Agricultural Development
ISFM: integrated soil fertility management
K: potassium
KAED: Kyrgyz Agro-Input Enterprise Development
N: nitrogen
P: phosphorus
PReFER: Privatization of Rwanda's Fertilizer Import and Distribution System
SSA: sub-Saharan Africa
USAID: U.S. Agency for International Development
VFRC: Virtual Fertilizer Research Center

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IFDC's Model Villages in Bangladesh harness the resources of entire communities in agricultural production. With a focus on specific crops and modern farming techniques, the villagers act as a single unit. This collective approach gives the communities greater buying and selling power, and ultimately greater profits.

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Parting Shot

TRAINING

IFDC conducted an international training program April 14-18 in Accra, Ghana, to improve fertilizer supply systems that better service the needs of farmers. The program, entitled "Fertilizer Value Chain – Supply System Management and Servicing Farmers' Needs," drew 29 participants from Ethiopia, Ghana, Kenya, the Netherlands, Nigeria, Rwanda, Tanzania, Uganda and the United States.

"Some of the greatest leaps in human progress have come not just from new technologies but from the power of applying those technologies locally."

– Jonathan Shrier, USAID Acting Special Representative for Global Food Security, Deputy Coordinator for Diplomacy for Feed the Future

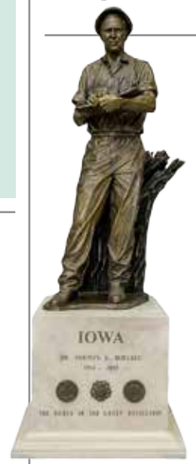
150 million metric tons

The amount of cassava produced in Africa. The continent leads world production of the starchy tuber, worth U.S. $15.5 billion annually.

Source: FAOSTAT, 2012 data.

Cows on a Plane

Update: In our last issue, we reported the transport of 235 heads of American cattle to Kyrgyzstan via cargo airplane. Since then, the cattle have been released from their 30-day quarantine and delivered to target farms. The improved livestock, under the EDF III component of the USAID Kyrgyz Agro-Input Enterprise Development (KAED) project, will help to improve livestock genetics, which will impact beef production.



"Food is the moral right of all who are born into this world."

– Dr. Norman Borlaug, agricultural scientist and Nobel Laureate.

Borlaug's tireless research sparked a wave of agricultural productivity known as the *Green Revolution*. He is credited with saving the lives of 1 billion people. Lawmakers unveiled a statue of Borlaug in the U.S. Capitol rotunda on March 25, 2014, the anniversary of Borlaug's 100th birthday.

842 million

The number of people in the developing world suffering from chronic hunger and malnutrition. The majority are smallholder farmers.

Smallholder farmers are the heroes of Earth Day (April 22). This year, IFDC celebrates these farmers, the stewards of our land, our teachers, our heroes. Visit our new blog, IFDC Perspectives (bit.ly/IFDCBlog), to learn how farmers who adopt sustainable farming techniques are changing the world.

70%

of the calories that rural Bangladeshis consume come from rice. Such an unvaried diet can be detrimental to a person's health.

With funding from USAID, IFDC and the Walmart Foundation are training **40,000** Bangladeshi women in fertilizer technology to increase their fruit and vegetable production.

These farmers will be able to provide their families with more diverse food. The additional income per plot is about U.S. $100.

90%

of this disposable income pays for their children's nutrition, education and medical care.

"Millions of people around the world go to bed hungry every night, and yet millions of tonnes of food end up in trash cans or spoiled on the way to market." ***– Dr. Jim Yong Kim, President of the World Bank***

IFDC's Connection:

Most food lost in developing countries occurs at the post-harvest or processing stage. IFDC connects farmers to partners that improve processing, storage and transportation infrastructure.

The **MOST WASTED FOODS** are those that people need most: Nearly **1/2** of **ALL** fruits and vegetables are lost or wasted.

The food currently lost in Africa alone could feed

300 MILLION PEOPLE.

IFDC's Second Decade: Reviving Markets

IFDC saw many challenges in its second decade, facing head-on a deathly famine in sub-Saharan Africa and the economic aftershocks from the fall of communism. Though challenging, these and other experiences caused the center to grow in reputation and in the scope of our work.

Beginning in the 1960s and reaching the greatest level of devastation in the mid-1980s, a pervasive drought and the resulting famine killed 100,000 people in the Sahel region of Africa.

Of the survivors, 750,000 depended solely on food aid to survive. The economies, agriculture, livestock and human populations of much of Burkina Faso, Chad, Mali, Mauritania and Niger among other countries, were severely impacted.

In response, IFDC increased activity in West Africa, spearheading projects in over 15 countries. Working with international partners, national governments and research institutions, these projects created sustainable, market-driven solutions for greater food production. The heightened sense of urgency in Africa led IFDC to establish its first permanent office on the continent, situated in Lomé, Togo. From there, IFDC continued to expand its range of fertilizer research, training and technical assistance activities throughout Africa.

Further east, work in Bangladesh was thriving after the success of IFDC's Fertilizer Distribution Improvement projects. The improved markets eased the introduction of a technology IFDC had been perfecting in benchmark trials across Asia: fertilizer deep placement (FDP). Introduced in Bangladesh in 1986, FDP curtails fertilizer use and magnifies yields. Since its introduction, the technology has spread to more than 2.8 million Bangladeshi farmers, and its use is being expanded to an additional 1 million farmers across the country.

Near the end of IFDC's second decade, communism began to fall. Countries such as Albania lost political and economic support, leaving citizens helpless. In late 1991, USAID tasked IFDC with building a revitalized agriculture sector in Albania to help stabilize the nation's economy. In 1993, IFDC helped create the Albanian Fertilizer and Agribusiness Dealers Association (AFADA), of which Joseph Limprecht, the U.S. Ambassador to Albania from 1999 to 2002, said "It's not only the basis for Albania's modern, competitive agricultural economy but… the foundation for Albania's faith in the free market."

IFDC's experience in Albania would forever change the way the Center approached agricultural development. It set a new standard for IFDC: holistic involvement in market development. A centerpiece for the third decade of projects, this new market development approach became the lynchpin of global efforts. ■

Albania

Few nations have experienced the rapid change in their agriculture sectors that Albania underwent in the 20th century. Over a span of 32 years, from 1950 to 1982, Albanian farmers lost all control of the land their families cultivated. The People's Socialist Republic of Albania (PSRA) further throttled the agriculture sector by imposing extremely restrictive tariffs and value-added taxes on fertilizer imports. This limited the availability and use of fertilizer. While the dissolution of the Socialist Republic in 1991 enabled farmers to regain ownership of their land, little was done to reverse the lingering agriculture sector market issues. Later that year, with funding from USAID, IFDC began building a private sector-led agriculture system that operated in a free market environment. One of the Center's earliest challenges was to establish a functioning and sustainable distribution system for agro-inputs. In 1993, IFDC accomplished that task by helping Albanian agro-dealers create the Albanian Fertilizer and Agribusiness Dealers Association, an agro-dealer group that reinvigorated Albania's farmers and economy. AFADA became a model for other economy-boosting sectors in Albania, improving the lives of countless Albanians in the years that have followed. ■

An Albanian man enjoys the fruits of his nation's improved economy. Without the success of AFADA, this may not have been possible.

1985

IFDC's Fertilizer Evaluation Program and Information System (FEPIS) becomes operational.

As a forerunner to later decision support software systems developed by IFDC, FEPIS allowed researchers to readily access the IFDC agro-economic database and perform analyses by crop, ecological zone or country. A simulation modeling component allowed for the extrapolation of these field results.

As drought spreads across Africa, IFDC strengthens development efforts. From the 1960s to a peak of devastation in the mid-1980s, pervasive drought and resulting famine killed 100,000 people in the Sahel region of Africa and left 750,000 dependent on food aid.

IFDC implemented development projects in over 15 African countries, working with international partners, national governments and research institutions to create sustainable, market-driven solutions to greater food production.

1986

IFDC introduces FDP in Bangladesh.
After successful tests earlier in the decade, IFDC introduced fertilizer deep placement to Bangladesh. Now over 2 million farmers are using the technology.

1987

IFDC establishes permanent office in Lomé, Togo, Africa.
IFDC's activities in Africa had grown significantly since its first mission in 1976. Therefore, IFDC established its IFDC-Africa Division with a permanent office in the West African nation of Togo.

Commercial testing of FDP briquetting machine begins.

Testing for the commercial production of FDP using a briquetting machine began in Indonesia. Less than a decade later, the FDP briquetting machine revolutionized fertilizer production in Bangladesh. IFDC continues to make the briquetters available to village-level agro-dealers at subsidized rates along with technology and business training. The briquetter has proven to be life-changing for numerous agro-dealers and their family members and employees.

1988

IFDC begins the Sub-Saharan Africa Fertilizer Policy Research Project.

A joint effort by IFDC and the International Food Policy Research Institute (IFPRI), the USAID-funded project assisted nations of sub-Saharan Africa in identifying key variables affecting the supply and demand of fertilizer. The project also evaluated various fertilizer policies that could stimulate the development of national and regional fertilizer sectors.

1989

IFDC begins benchmark Integrated Soil Fertility Management (ISFM) tests in Togo.

During 1989, IFDC opened an ISFM benchmark experimentation site in Togo to study the cropping environment of the Northern Guinea savanna zone of West Africa. ISFM strategies center on the combined use of mineral fertilizers and locally available organic amendments (crop residues, compost and green manure) to replenish lost soil nutrients.

IFDC staff provide support to African fertilizer companies.

IFDC engineers supported the *Office Togolais des Phosphates* (OTP) in its construction of a phosphate rock beneficiation pilot plant. Efforts included coordination of the delivery of equipment and general engineering assistance during the initial construction phase of the project.

IFDC's Africa Division holds its first in-country training program.

The fertilizer technology program was held in Kumasi, Ghana, and focused on technology transfer and the development of communications materials to support extension efforts.

IFDC focuses on environmentally friendly fertilizer solutions.

Building on the introduction of FDP technology in Bangladesh and other parts of Southeast Asia, IFDC scientists focused on developing other nutrient-saving, environmentally sensitive products and cropping technologies. The Center's research efforts focused on slow-release polymer coatings and urease inhibitors in urea (nitrogen) fertilizers and methods to minimally process local phosphate rock for direct application.

1990

Dr. David B. Parbery (1931-1992) is appointed second managing director of IFDC.

On February 1, 1990, Dr. David B. Parbery began his tenure as IFDC's second Managing Director. Eight months later, the IFDC Board of Directors reluctantly accepted Parbery's resignation due to health reasons. An international development specialist from Australia, Parbery's 37-year career spanned from work as a research scientist to director of several international development organizations.

Dr. Paul Stangel (1929-2012) is appointed IFDC's first president and CEO.

A founding member of IFDC in 1974, Stangel served as director of the Outreach Division and deputy managing director of programs before being named IFDC's first president and chief executive officer. He remained in that position before retiring in 1992.

1991

IFDC revitalizes Albania's economy with its first national agricultural market development solution.

The People's Socialist Republic of Albania's near dissolution in late 1991 led to the election of the national Democratic Party the following year. With no experience in building a free market economy, Albanians faced extensive poverty. In response, IFDC, tasked by USAID, first evaluated the fertilizer market situation, then helped to build Albania's agriculture sector to stabilize the nation's economy and grow its gross domestic product (GDP).

1992

IFDC establishes its Asia Division with a permanent office in Dhaka, Bangladesh.

Following nearly 15 years of continuous activities in the country, IFDC established its Asia Division in Dhaka, Bangladesh. The new division allowed IFDC not only to serve Bangladesh more efficiently but to operate in other parts of Asia and Eurasia more effectively.

DSSAT computer program introduced.
For nearly a decade, IFDC's crop and systems model developers collaborated closely with the USAID-funded International Benchmark Sites Network for Agrotechnology Transfer (IBSNAT) project. The culmination of this partnership was the introduction of the Decision Support System for Agrotechnology Transfer (DSSAT) computer program. The software incorporates crop models, databases and application program components that allow crop sequences and rotations to be simulated over long periods of time under multiple variables.

Dr. Amit H. Roy is appointed second president and CEO of IFDC.

Following the retirement of Dr. Paul Stangel, Dr. Amit Roy was appointed second president and CEO of IFDC. Roy joined IFDC in 1978 as a chemical and special projects engineer. Among other efforts, he contributed to IFDC's successful focus to reinvigorate Bangladesh's agriculture sector. Under his leadership, IFDC developed a vibrant market for agricultural supplies and products in Albania where none existed previously.

1993

IFDC creates a national trade organization for the first time: the Albanian Fertilizer and Agribusiness Dealers Association (AFADA).

In 1999, the U.S. Ambassador to Albania noted that "AFADA is not only the basis for Albania's modern, competitive agricultural economy, but it provides the foundation for Albania's faith in the free market. Its impact spreads far beyond agriculture itself and will influence growth throughout the economy."

1994

Nobel Laureate Dr. Norman Borlaug (1914-2009) is appointed to the IFDC Board of Directors.

Often credited with saving over 1 billion people worldwide from starvation, Dr. Norman Borlaug spent most of his life leading the introduction of high-yielding wheat and other crop varieties to impoverished nations in order to relieve hunger and stave off famine. Borlaug served on the IFDC board of directors from 1994 to 2003.

The NEW AGE of Agricultural Development in Africa

Fifty years ago, 40 percent of the world's people lacked daily access to food. Governments themselves could not solve the growing problem, so they turned to specialized non-profit development partners for solutions. These organizations provided expertise in various agricultural niches, but none provided solutions to address all market issues simultaneously.

Today, this much broader approach is critical, particularly in sub-Saharan Africa. That is why IFDC developed an innovative and scalable solution to agricultural market self-sufficiency. The evolution of this approach to farm-to-market linkages began in 2006 with IFDC's 1000s+ project in West Africa. This project introduced the Competitive Agricultural Systems and Enterprises (CASE) methodology, a revolution in agricultural development.

Under CASE, farmers are grouped into clusters and trained in the production of a common crop. The groups then connect with fertilizer and seed suppliers. They link to their value chain – networks that include banks, agro-dealers, storage facilities, processors and other agribusiness partners.

Most importantly, the farmer groups connect with private sector buyers in regional and global food markets.

In a recent interview, Arno Maatman, coordinator of IFDC's pan-Africa 2SCALE project, reflected on the evolution of the approach. "When we started 1000s+ using CASE, the whole concept of agribusiness clusters to support sustainable farmer-market linkages was new. Today, the concept is spreading in Africa," said Maatman. "2SCALE is a descendant of that project, only we're scaling up our efforts substantially." The 2SCALE project is the largest agribusiness incubator in Africa. It spans 12 countries and affects more than 1 million farmers.

According to Maatman, the farmer cluster concept is key. It focuses on the networks that need to evolve around farmer production. In the past, farmers were at the mercy of unanticipated market conditions and not always fair-minded produce buyers. 2SCALE strengthens the ability of farmers and local entrepreneurs to identify the most profitable channel options.

Other experts agree with the approach. In a report prepared for the 2013 G-8 Summit of world leaders held in Ireland in June, Sir Gordon Conway,[1] professor of International Development at the Imperial College London, advocates strongly for this new approach. "Governments, donors, businesses, scientists and development practitioners alike should work together to help African smallholder farmers better access markets, as a way of increasing productivity, nutrition and incomes, and to ensure that they are sufficiently safeguarded from the risks of doing so."

Farmers better understand the cost structure of a given value chain and the factors that influence their bargaining power. The approach also manages farmer risks and ensures sustainable integration into respective value chains.

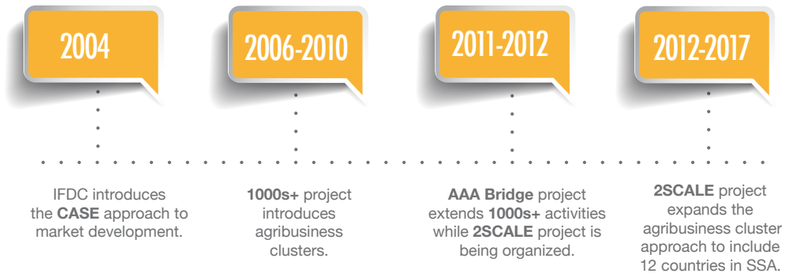
But Conway also warns of the pitfalls of a 'one solution fits all' approach that could derail early gains. Maatman says the project avoids such issues by empowering anyone in the cluster to become a thought leader, or 'champion.' "We do not have a blueprint or single approach; we try to develop networks utilizing entrepreneurs who innovate and can respond to changes in market environments."

And the approach is working. In 2SCALE's first 18 months, more than 190 agribusiness clusters began operating in 10 countries. Farmer groups now link to more than 1,000 private sector firms. Clusters include food crops, cash crops and dairy and poultry production, among others. Large private food companies and bank partnerships have emerged. Additional cooperatives are being negotiated.

Yet, the question of equitable access to these opportunities by the poorest of Africa remains. With this new form of agricultural development, we have more power than ever to create income equity. Providing farmers the right tools and training, linking them to one another, to market services and to buyers, provides them with unprecedented social and economic opportunities. This is the future of agriculture in Africa, and it's changing everything. ■

[1] ***Sir Gordon Conway is an agricultural ecologist and professor of international development at Imperial College London. He serves as director of Agriculture for Impact, which advocates for more European government support for agricultural development in sub-Saharan Africa.***

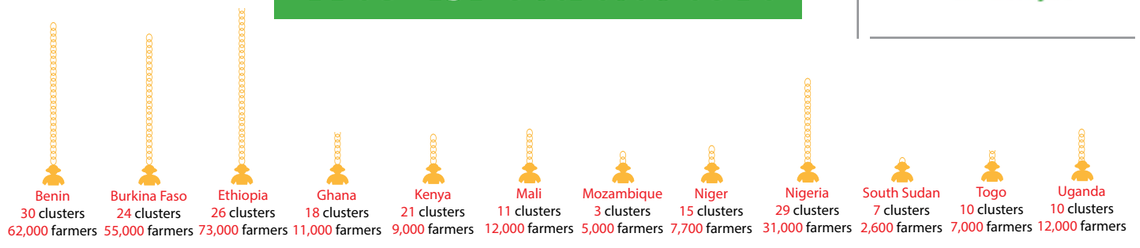
EVOLUTION OF A CONCEPT



24 Months 1,870 Businesses

In 24 months, 204 agribusiness clusters were operational and linked to 1,870 private firms.

The Breakdown



Examples of 2SCALE Private Sector Partners

PureCircle – Everything stevia
FirstBank
aace foods
Bakker Brothers
FrieslandCampina
EQUITY Bank
RIJK ZWAAN
MUELLER
DOREO PARTNERS – Creating Companies | Creating Wealth | Creating Jobs
ADVANTA
hnw fresh&dry ltd

FDP IN SUB-SAHARAN AFRICA

IN SSA

FDP recommendations have been made only for

RICE

but according to the coordinator of IFDC's FDP initiative in Africa, many proactive farmers are using the technology on other crops such as

TOMATOES, ONION, SUGARCANE AND MAIZE

CURRENT RICE PRODUCTION IN AFRICA IS

2.3 mt/hectare

Widespread adoption of FDP can increase rice production by up to **20%**.

BENEFITS & COMPONENTS OF FDP

The Briquettes
1.8-2.5 grams of urea or a mix of N, P and K.

Increased Production
Average yield increases of 15-18 percent.

The Applicator
Reduces drudgery. Saves time and money on labor.

The Briquetter
Produces briquettes. Increases dealer incomes.

Reduced Pollution
Fertilizer use cut by one-third. Less runoff. Fewer emissions.

Use of FDP in Bangladesh has proven to increase production and incomes across the value chain. Since 2009 the technology has been implemented in Africa and is now part of projects across 17 countries in SSA. When used with improved water management practices and seeds, farmers can receive up to $400 per hectare* in additional income annually. And while FDP has been used most widely on rice, initial field trials indicate that the technology is well-suited for other cereal crops and vegetables.

* In double cropping systems (two rice crops per year), farmers in Bangladesh and Africa are realizing about $400 in additional annual income per hectare than farmers using traditional fertilizer broadcasting methods.

Featured Infographic

IFDC President Discusses Challenges in Africa's Farm Production

In the February special edition of the United Nations magazine *Africa Renewal*, Dr. Amit Roy, IFDC president and CEO, reflects on the opportunities of and challenges to agricultural growth in Africa. The article, "Boosting African Farm Yields," highlights poor soils, low fertilizer use, infrastructure investment and technologies to improve yields.

As the article notes, the importance of agriculture to Africa's economy cannot be underestimated. About 65 percent of Africa's labor force works in agriculture. The sector accounts for 32 percent of the continent's GDP. But since 1993, population growth has overtaken food production, causing a rise in hunger.

One obstacle to increased productivity is the ongoing deterioration of Africa's soils, notes Roy. "When farmers plant the same fields season after season and cannot afford to replace the soil nutrients… the soil is literally mined of life," he says.

Around 8 million tons of nutrients are removed from soils annually. Part of the answer is better farming methods like crop diversity, improving soil conservation and using improved seeds. But the key to a 'revolution' in African agriculture, says Roy, is greater fertilizer use.

However, increasing use is a challenge. African farmers pay as much as six times the average world price due to reliance on imported fertilizers, high transport costs and the absence of suppliers. Because millions of family farmers survive on less than a dollar a day, imported fertilizer is simply unaffordable without changes in the market.

One way to make fertilizers more affordable is to increase local production. This reduces costs, eases the pressure on foreign currency reserves and brings the supply closer to farmers. West Africa's vast and largely untapped natural gas resources, notes Roy, make the region ideally suited for nitrogen fertilizer production. Africa also has ample deposits of phosphorus.

But investment in fertilizer production will only come with increased demand, Roy asserts. Persuading family farmers to increase use will require significant improvements in rural infrastructure, expanded networks of suppliers and greater financial returns.

Proponents of organically driven agriculture argue that increased fertilizer use brings potential environmental risks. They assert that farmers should use more manure, compost and other organic fertilizers. While these amendments are important, agrees Roy, he points to limitations. "The quality of animal manure is dependent on the quality of the food the animals are fed." With soil severely depleted, "the fodder contains little of the nutrients needed by crops." Roy adds that organic fertilizers alone are not the answer to soil fertility. He urges the increased use of both organic and chemical fertilizers in combination.

A plant health clinic on market day in the village of Wangigi, Kenya. Farmers can see a plant pathologist who reviews samples of their crops. Photo: Panos/Sven Torfinn/CABI.

"Fertilizer is not a silver bullet for Africa's agricultural problems," Roy admits. "The fertilizer doesn't help if it arrives too late, or the crops aren't watered or you can't sell the harvest. Farmers know this."

Roy says that governments should end nationalized agricultural control and focus on managing 'public goods' like improved rural roads and infrastructure.

He also notes that expanding private sector involvement in supply activities is the long-term solution. This approach provides governments a key opportunity to attract lucrative private investment.

Roy further emphasizes that Africa must do a better job applying science and technology to agricultural issues. Expanded extension services should be on the front lines, improving land and water management and introducing these new techniques to farmers more quickly.

To read the full article, visit: http://bit.ly/PQJYam. ■

USAID Visits KAED

In April, USAID officials visited two IFDC-supported sites in southern Kyrgyzstan: Nukok, a seed production cooperative, and Oasis Agro Ltd., a venture that is part of a public-private partnership with the KAED project. Attending the tour were: Manpreet Anand, Deputy Assistant Administrator, USAID Asia Bureau; Michael Greene, USAID Kyrgyz Republic Mission Director; Kevin Dean, USAID Deputy Mission Director; and Charles Specht, USAID Agriculture Development Specialist.

BANGLADESH

Almost half of the country's population is employed in its agriculture sector, with rice the single most important crop.

2.8 million farmers in Bangladesh are using Urea Deep Placement.

Rice Seasons in Bangladesh

Aus – The first rainy season crop. Planting in the spring. Harvest in the summer.

Aman – The second rainy season crop. Planting mid-summer. Harvest in the fall.

Boro – Irrigated in the dry season. Planting in December/January. Harvest in the spring. Highest yields achieved in *Boro*.

Kumtor Land Rehabilitation

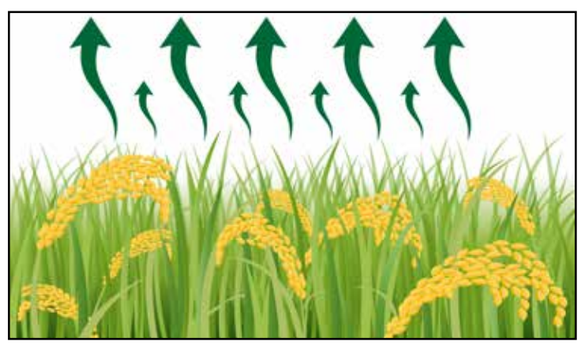
In April, Kumtor Gold Company and KAED launched the second joint project on rehabilitation of 1,500 hectares in Kyrgyzstan. Kumtor allocated $242,000 for rehabilitation works. KAED and local farmers are investing expertise and labor worth about $80,000. The activity is rehabilitating irrigation systems and restoring soil fertility.

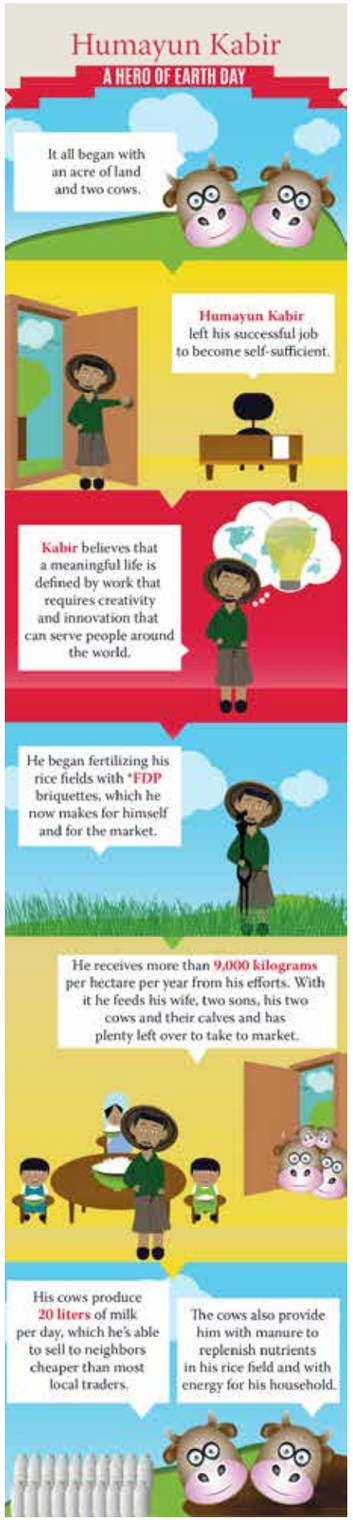
48%

of the **2.3 million person labor force in Kyrgyzstan** is involved in agriculture, adding **$2.8 billion annually** to the nation's economy.

Reducing Greenhouse Gases

In cooperation with BAU and BRRI, IFDC is performing tests to quantify the amount of greenhouse gases released from rice cropping under various fertilizer and irrigation conditions. Results so far for FDP show promise in reducing these emissions.





A Success Story Update: Humayun Kabir

After sending out Humayun Kabir's story (see infographic on the left) to our global communications team, an IFDC soil scientist in Bangladesh who knew Kabir personally and had witnessed his success first-hand contacted us with an update.

When we last heard from Kabir, he was leasing land to teach farmers about the benefits of better fertilizer use. "We have to take care of everybody and everything around us," he said when we last interviewed him.

Recently, Kabir has expanded his business by making fertilizer briquettes for every fertilizer dealer in his area. He's making the technology more affordable by lowering his production price by 25 percent. Still, Kabir continues to increase his earnings. Our field scientist reports, "He has built a new house, bought new clothes for his family and made many other financial advancements."

Giving farmers better fertilizer works. Farmers from West Africa to East Asia continue to learn to use environmentally friendly fertilizer and sustainable farming techniques. And it's a true economic gain. They are not simply surviving. They are thriving. ■

Model Villages in Bangladesh

It began in Bakshi, a village of 230 farming families. The goal: create a model village to demonstrate the benefits of community-wide adoption of FDP.

Two years later, Bakshi regularly shows increased yields of 15 to 30 percent for all crops including rice, maize and about 10 different vegetables. The cropping intensity (amount of land that is cropped) is up by 275 percent – a reflection of multiple cropping seasons. The village farmers also aggregate their crops to sell in the market, bringing higher prices and increasing incomes by 20 to 25 percent annually. As an added bonus, women are experiencing more job opportunities and greater income potential. Women growing more vegetables in their home gardens using FDP are increasing gender equity in their households. By growing more vegetables, families not only have more to sell but more to eat, as family consumption of vegetables has increased by up to 30 percent. In a traditional rice-heavy diet, this bolsters family nutrition exponentially.

Overall, the model village approach successfully demonstrates the benefits of widespread adoption of FDP. By bringing farmers together to achieve a set goal, we see higher yields, better incomes and more nutritious diets. With the Model Village approach, lives are changing across Bangladesh. ■

FDP
Shown Through Model Villages

- Average gross margins increase by $275/ha
- Yields increase up to 30%
- Incomes rise up to 25%

* Fertilizer deep placement, or FDP, is the placement of fertilizer briquettes in the soil next to the plant's root zone, either by hand or using a mechanical applicator.

KAED – Versatility in Pictures

Since 2001, the Kyrgyz Agro-Input Enterprise Development project and its successor projects (KAED II and KAED Follow-on) have supported farmers in adopting modern agricultural practices to increase food production, improve animal health and increase rural incomes.

KAED is one of IFDC's most versatile projects, active in a diversity of sub-sectors. Livestock feed, seed production, poultry and cattle are just a few sectors that have benefited under KAED. Through public-private partnerships, KAED has also rehabilitated unused land and infrastructure.

The USAID-funded project is currently operating under an extension through September 2014.

Top: KAED rehabilitated land and irrigation across the country.

Mid left: Asilidin Nasiridinov, a successful poultry farmer, benefited from improved feed.

Mid right top: Imankulov Kanybek, a farmer in northern Kyrgyzstan, experienced higher yields from KAED-supported technologies.

Mid right bottom: Lailahan Abduraimova, chairwoman of the Pesh-Kadam agricultural cooperative in southern Kyrgyzstan, shows the fruits of her labor.

Bottom left top: USAID Coordinator Dan Rosenblum visited the project during a technology handout ceremony.

Bottom left bottom: One of the first things IFDC did in Kyrgyzstan was establish the Association of Agribusinessmen of Kyrgyzstan (AAK).

Bottom right: Kalmurat Djuaarkulov, head of the Animal Reproduction Biotechnology Center, helps farmers with improved livestock care and breeding practices.

ACMA Benin

A new program to improve the agriculture sector in Benin launched April 23. The Communal Approach for the Agricultural Market in Benin (ACMA Benin) will link producers to markets in neighboring Nigeria and to local markets in Benin. The project will also improve rural infrastructure, promote access to finance and focus on women. The Embassy of the Kingdom of the Netherlands in Benin is funding ACMA from 2013 to 2017.

In 2013, **AACE Foods**, a Nigerian company that processes spices, vegetables and cereals, sourced high-quality ginger from 2SCALE clusters. The company also partnered with 11 farmer groups that produce hot peppers, tomatoes, maize and soybeans.

"Business as usual is not going to provide us with quality, healthy vegetables that the market requires. We should move toward new ways of doing business, working closely together with vegetable farmers to ensure good water and pesticide use."

- Mrs. Catherine Krobo-Edusei Benson, managing director of Eden Tree, a high-end vegetable wholesaler in Ghana. Benson is referring to the IFDC GhanaVeg project, an initiative to provide Ghanaians with quality vegetables.

USAID's West Africa Cotton Partnership Project (WACPP) is assisting cotton farmers in Benin, Burkina Faso, Chad and Mali. The project, running from 2014 to 2018, will scale up "good agricultural practices" in cotton farming systems. In addition, WACPP is facilitating institutional partnerships and specifically addressing the challenges women face in cotton-producing households. WACPP is a follow-up to the USAID West Africa Cotton Improvement Program (WACIP), implemented by IFDC from 2006 to 2013. About 1.5 million cotton farmers benefited from WACIP training.

40,000 cocoa farmers will benefit from the Cocoa Rehabilitation and Intensification Programme for Ghana. The project is a public-private partnership with cocoa-buying companies. This new approach puts the private sector, which co-funds 40 percent of the project, in the lead. Companies are invited to submit proposals for funding. IFDC and Solidaridad West Africa provide technical assistance. Additional funding is provided by the Embassy of the Kingdom of the Netherlands from 2013 to 2017.

TAP Program Gets Fertilizer to Farmers

IFDC is helping farmers in Nigeria's Federal Capital Territory (FCT) and Sokoto State register to access subsidized fertilizers and seeds through the 2014 pilot Growth Enhancement Support (GES) Touch and Pay (TAP) program. The TAP technology makes it easy for farmers to enroll in Nigeria's GES fertilizer program.

GES is one of the Nigerian government's first steps in boosting its agriculture sector. To get fertilizer into farmers' hands, the 2013 GES program issued electronic vouchers to farmers via mobile phones. The program linked more than 4.5 million farmers to subsidized fertilizers. IFDC coordinated activities in 15 states, directly helping 2.4 million farmers access the critical input.

The system, however, met numerous challenges, including unreliable mobile phone networks, farmers' lack of mobile phones and security issues. Consult Hyperion designed the TAP system to ease and secure farmer registration.

IFDC is using the technology to register a targeted 500,000 farmers both online and offline with the use of a device powered by the Android operating system. A mobile phone network is not required. Farmers, agro-dealers and enrollment staff simply "tap" their registration card to store information in the device.

The program will bring 100 agro-dealers closer to farmers and will employ 500 new GES field staff. The United Kingdom Department for International Development (DFID) funds the TAP program. ■

Video Highlights Nigeria's New Economic Vision

IFDC recently released "Seeds of Growth: The Policy Change That Transformed Agricultural Inputs Supply in Nigeria." The video tells the story of the nation's new focus on agriculture to build a more dependable economy. As the nation transitions to a private sector-led agricultural market system, it supports farmer access to fertilizer through a national fertilizer subsidy program. Nigeria is investing in its infrastructure and is supporting the construction of several new fertilizer plants to become operational over the next few years. The video is available in its full 28-minute length, or as a 3-minute overview. View either version at www.ifdc.org/Videos/28509. ■

A Success Story: Technology Changes Life for Farming Family in Burkina Faso

Nouhoun Konaté is a rice farmer in the Kou Valley of Burkina Faso. He is the eldest son in a family of more than 20 people and manages the 9-hectare family farm.

Prior to 2008, finding quality fertilizer and seeds was difficult. Without the inputs, his rice yields averaged only 2-3 tons per hectare. But conditions improved with the arrival of state extension services. With better access to fertilizer, Konaté was able to improve his yields to 5 tons of paddy per hectare. Yet, despite this significant gain, the yields were not enough to feed his extended family.

In 2009, Konaté learned about fertilizer deep placement technology. As a member of the Rice Cooperative Union of Bama, he took part in an IFDC rice field day. Convinced of the results, he joined the program as a volunteer in a 9 square meter demonstration plot on his land. His yield increases led him to double the size of his plot in 2010. During the 2011 dry season, his plot increased to 45 square meters. More good results convinced him to put a full hectare of rice under FDP, harvesting 6.5 tons. In 2012, he yielded almost 7 tons.

After four years, Konaté describes FDP as a simple and profitable technology. He reports that each year he sees the many benefits over the traditional broadcasting of urea. With the latter, he never exceeded 5 tons per hectare. He uses less urea – two bags instead of four per hectare – and applies it only once, rather than several times when using broadcast fertilizer.

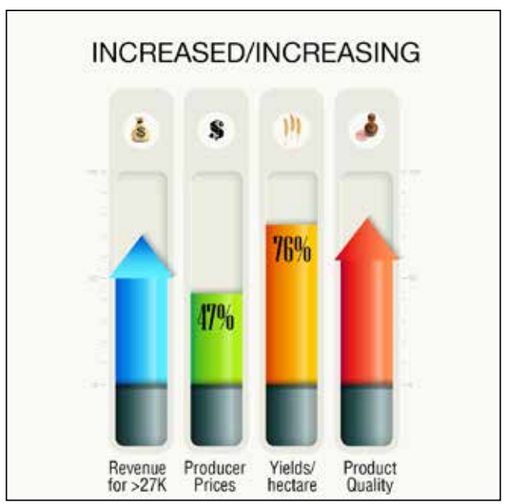
Konaté says that FDP has changed his life. His harvests now feed his family and he sells the remainder. With his increased income, he pays for his children's schooling and bought two motorcycles for himself and his wife, who started a small business of her own. He also owns more than 10 oxen. Konaté is a model in his community, where his advice is regularly sought. During a rice state fair, he received several awards, including a donkey cart, bags of urea, money and a lot of media attention.

According to Konaté, his ambition is to share his experience and knowledge with fellow rice farmers in Burkina Faso and elsewhere. He now has nearly 2 hectares under FDP and is an ambassador for his community. ■

Left: Konaté during a field day with officials of the Burkina Faso Ministry of Agriculture.

The new IFDC project, "Produce More Rice With Less Fertilizer" (known as PRIME), is expanding FDP across West Africa. PRIME is promoting FDP to boost rice production in the 15 member countries of the Economic Community of West African States (ECOWAS). ECOWAS funds the project, which runs from 2014 to 2018.

An additional project, "Scaling Up Fertilizer Deep Placement and Microdosing Technologies in Mali" is promoting the use of FDP in irrigated rice and fertilizer microdosing for sorghum and millet crops. Microdosing is the application of very small amounts of fertilizer directly to plant roots. The method increases fertilizer efficiency and can double the productivity of millet and sorghum crops. The project is funded by USAID from 2014 to 2017. ■



Sesame Project Builds Profitable Market System in Mali

The IFDC project, Development of Export-Oriented Sesame Production and Processing, ended recently in Mali, West Africa. IFDC and the Royal Tropical Institute (KIT) initiated the project with funding from the Common Fund for Commodities (CFC). The project centered on the development of agribusiness clusters and sesame-specific value chains that included suppliers, producers, transporters, traders, processors and exporters. The three-year project strengthened farmers' market position by improving production and processing using quality control systems at the farm level. Field schools built farmers' capacities in production using IFDC's Competitive Agricultural Systems and Enterprises approach. The result was increased sesame yields with higher purity and greater profits for farmers. More than 27,000 farmers saw average yield increases of 76 percent per hectare, while market prices increased up to 47 percent. ■

2014 IFDC Africa Committee Meeting

IFDC's 2014 Africa Committee Meeting was held in Rabat, Morocco, in May. Participants discussed IFDC's progress and future work to increase food security in Africa and the world.

Top left: Prof. Mohammed Sadiki, Secretary General (Deputy Minister) of the Ministry of Agriculture in Morocco.

Top right: Board members Dr. Mohamed Badraoui, Patrick Murphy and Gerard Doornbos, vice chair of the board, discuss IFDC's progress in sub-Saharan Africa.

Middle left: African Union Commissioner Rhoda Peace Tumusiime and Dr. Steven Leath, President of Iowa State University.

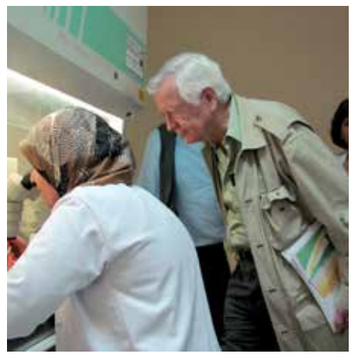
Middle center: The Africa Committee visits the National Agronomic Research Institute (INRA) in Morocco. Here, laboratory workers inspect fruit.

Middle right: An INRA researcher gives a presentation on the institute's work.

Bottom left top: Board member Patrick Murphy observes an INRA scientist at work.

Bottom left bottom: AU Commissioner Rhoda Peace Tumusiime, Prof. Mohammed Sadiki and Dr. Amit Roy open the meeting with presentations on the future of agriculture in Africa.

Bottom right: A view of the Office Chérifien des Phosphates (OCP) fertilizer plant in Morocco. OCP is currently constructing a fertilizer production unit exclusively for Africa.



PReFER

The IFDC project in Rwanda is helping link rural agro-dealers to fertilizer importers and traders in Dar es Salaam, Tanzania. This could double fertilizer supply from 30,000 to about 60,000 tons by 2016. The Privatization of Rwanda's Fertilizer Import and Distribution System (PReFER) is funded by USAID and runs through 2015.

Chilies in Kenya

More than 5,000 small-scale farmers in coastal Kenya signed contracts with the large private firm Equator Kenya Ltd to produce chilies for export to Europe. The key to this partnership – mediated by the 2SCALE project – is the use of low-cost, water-efficient drip irrigation systems. This guarantees high-quality products and increased yields and profits in an area where rainfall is poor.

73,000

The number of Ethiopian farmers involved in a partnership between 19 agribusiness clusters and the Sesame Business Network. Field activities began in mid-2013 and include demonstration plots, field days and action research on production costs, post-harvest losses and other areas.

The African Union – headquartered in Addis Ababa, Ethiopia – has declared 2014 the Year of Agriculture and Food Security. 2014 also marks more than a decade since the adoption of the Comprehensive Africa Agriculture Development Programme (CAADP) – an Africa-led initiative to boost agricultural productivity on the continent.

Kenya

Agriculture is the main source of income for over 60 percent of Kenya's population.

Women Farmers in Rwanda Receive Labor-Saving Tools

Fertilizer deep placement was introduced in Central Africa's Great Lakes Region by IFDC's CATALIST project. CATALIST-2 is extending that effort, promoting FDP as effective in increasing yields while conserving resources. But labor requirements are high due to the manual labor involved in point-placing fertilizer briquettes into the soil. In 2013, IFDC introduced a mechanical FDP applicator that reduces this labor. They are now making their way to Africa. Recently, the Cooprico cooperative in the Gatsibo District of Rwanda received 50 applicators.

Rice farmer Marie Gorethe Cyumuzoza notes, "It is sometimes inevitable for us to do farm work while carrying babies on our backs. This machine will help us a lot." The group is 80 percent women.

CATALIST-2 is funded by The Netherlands' Ministry of Foreign Affairs through its embassies in Burundi, DRC and Rwanda and the Swiss Agency for Development and Cooperation. ■

A Success Story: Farmer Doubles Yields and Creates Business Using Improved Farming

Gabriel Manuel lives in the Cortina de Ferro community in the Beira Corridor of Mozambique. He is a family farmer who depends on his 6-hectare farm to feed his wife and five children. Four of those hectares produce the family's beans, maize and vegetables. The remainder supports livestock and fruit trees.

In past seasons, his land yielded 1,000-1,200 kilograms of maize per hectare. "I always practiced farming for survival, but my yields were low," Manuel explains. "To solve the production problem, I increased the area I cultivate, but it did not increase my production. There was always a problem with weeds in my fields."

With training from the USAID Agricultural Input Markets Strengthening (AIMS) III project, Manuel is using new techniques and tools, including improved fertilizer blends and weed prevention products. As a result, his yields more than doubled to 2,600 kilograms per hectare. "My yield increase was remarkable. With weed sprays, weeds are no longer a problem." AIMS III and Manuel partnered to use one-quarter of a hectare of his land as a demonstration plot for the Chimbua, Chichira and Cortina de Ferro communities. He demonstrated advanced agricultural practices such as crop rotation, intercropping, mulching, the use of different fertilizer formulations and other practices taught by the project.

"Many of my neighbors were impressed by the results of my demonstration field, so they contacted me to help them apply fertilizers and weed sprays on their fields," says Manuel. "The opportunity to provide services to other farmers and make more money is exciting." He is now providing weed prevention services to fellow farmers. "This is a business opportunity. I have surveyed and listed the farmers interested. Next season, I will apply weed sprays, charging for the cost of supplies and application."

Encouraging agro-dealers and lead farmers like Gabriel Manuel to offer profitable weed prevention services is a key innovation. IFDC is also working with blending companies to ensure that agro-dealers have site-specific fertilizer available for smallholder farmers. ■

Left: Gabriel Manuel shows his improved maize yield.

Special Fertilizer Blends: Micronutrients Are Key

Fertilizer blends in Africa generally include 'standardized' amounts of nitrogen, phosphorus and potassium (NPK). But due to the complexity of site-specific soil, crop and weather conditions, these standard blends often are ineffective in creating substantial yield increases.

In 2013, the USAID-funded AIMS III project in Mozambique introduced a specialized fertilizer for maize. The blend adjusted the levels of N, P and K, and introduced appropriate levels of micronutrients such as sulfur, zinc and boron. The blend proved to be highly effective on maize, and IFDC expanded its specialty fertilizer efforts. Other crop- and soil-specific fertilizer nutrient blends were tested in five East African countries. Trials in Burundi, Ethiopia, Mozambique, Rwanda and Uganda tested various alterations in nutrient combinations and their effects on crop yields.

In Ethiopia, trials produced 35 percent increases in wheat yields. This was due to the addition of sulfur, zinc, boron and copper to the standard nitrogen/phosphorus recommendation. In Rwanda, average yields increased with the deep placement of fertilizer briquettes into the soil, followed by the application of various micronutrients.

Crop	Country	Current Recommendation	Secondary/ Micronutrients Added	Additional Nutrients
		Yield, metric tons ha^{-1}		
Maize	Ethiopia	5.6	6.7	S, Zn, B
Maize	Burundi	2.9	5.2	Dolomite*, S, Zn, B, Cu
Maize	Mozambique	3.0	4.2	Mg, S, Zn, B
Wheat	Ethiopia	3.9	5.6	S, Zn, B, Cu
Rice	Rwanda	4.3	5.9	S, Zn, B, Cu
Beans	Burundi	2.0	3.0	Dolomite, S, Zn, B
Potato	Burundi	16.8	23.1	Dolomite, S, Zn, B

*Dolomite is a type of lime containing calcium and magnesium.
Note: B = boron, Cu = copper, Mg = magnesium, S= sulfur, Zn = zinc.

The most significant responses were in Burundi. In addition to the nitrogen and phosphorus application, dolomitic limestone (rich in magnesium and calcium) was combined with sulfur, zinc and boron. The blend resulted in large yield increases over current NPK recommendations for maize, beans and potatoes. Data are still pending for rice, wheat and cassava.

To IFDC researchers, a clear pattern is emerging. Test results show that low levels of secondary and micronutrients in African soils limit NPK effectiveness. So, thinking beyond N, P and K is critical for yield improvement. More robust blend options must be created. And they must be accessible and affordable for the smallholder farmer. ■

Ethiopia on the Rise:

Nation Leads SSA in Annual Agricultural Growth

Recently, much attention has been given to countries like Nigeria, Ghana, Rwanda and others who have exceeded 8 percent annual agriculture sector growth. But often overlooked is the nation of Ethiopia, who in the last five years has sustained 10 percent sector growth. According to the United Nations Department of Economic and Social Affairs, this benchmark exceeds the growth of any other country in sub-Saharan Africa.

In a region where agriculture tends to represent 20 to 30 percent of national economies, Ethiopia's sector represents 47 percent of the nation's gross domestic product. His Excellency Ato Tefera Derebew, Minister of Agriculture and Rural Development, is leading the agricultural revolution.

"The Government of Ethiopia has recognized agriculture as the central element of economic growth and poverty reduction," says Derebew. The centerpiece of this growth is the government's five-year Growth and Transformation Plan, which aligns with broader Comprehensive Africa Agriculture Development Programme (CAADP) goals. The plan is improving production at the farm level and strengthening market linkages to curb poverty and food insecurity.

Since its introduction in 2010, the plan has paved the way for real progress in the sector. Ethiopian farmers apply an average of 18 kilograms of fertilizer per hectare of land, more than double the sub-continental average of 8 kilograms. This is due to increased access to fertilizer and seeds through a national network of rural extension centers. Nearly 8,500 farmer training centers span Ethiopia's nine regions, staffed with 63,000 extension agents. They are the nation's technical specialists and the rural farmer's primary support.

Mr. Bekele grows carrots on his family farm. Half of his crop is for home use. The remainder is sold to the market. Photo courtesy of FAO/IFAD/WFP/Petterik Wiggers.

The surge in productivity has made the country ripe for private sector investment. In 2013, Canada's Allana Potash announced its Danakhil mining project to be built in the Dallol region of northeast Ethiopia. Allana estimates that the mine will produce about 1 million tons of potash annually within five years. The company has partnered with Israel's ICL to build the African fertilizer market.

"The Danakhil mine will provide potash for Ethiopia and Africa, and…will enable local farmers to increase agricultural output and food for the region," notes ICL Chief Executive Stefan Borgas.

The government is also investing its own resources. Officials recently announced a $2.8 billion investment in new fertilizer factories 200 miles west of Addis Ababa. The plants are expected to be operational in three years, with capacity to produce 300,000 tons annually. Four blending (fertilizer mixing) plants are also being constructed to produce site-specific fertilizers. IFDC, the Ethiopian Agricultural Transformation Agency and the Ministry of Agriculture are working together to achieve this goal. The special fertilizer blends have increased maize and wheat yields by 20-30 percent. The first of these plants will be operational in June 2014.

Ethiopia's national development initiative calls for the nation to become a middle-income country by 2025. It is an aggressive goal. Though 85 percent of the labor force (39 million people) is dedicated to agriculture, challenges remain. Climate change, land degradation, pests and plant diseases are factors that require sustainable solutions. And both public and private sector participation in the market is pivotal. "We must have a dialog and commitments to align, scale up and improve the quality of long-term public [and private] investment," says Derebew.

A transformational approach to agricultural development should be high on the agenda of every African nation. The links between increased farmer productivity, well-functioning markets and a successful agriculture-based economy are irrefutable. It is a system that benefits everyone involved in the sector. It feeds entire populations sustainably and creates wealth for nations. ■

Ethiopia by the Numbers

Agriculture Sector:
85%
of total workforce

Agriculture as Portion of GDP:
47%

Major Crop: Maize
6.2
million tons annually

Population Living in Rural Areas:
83%

This year, IFDC commemorated Earth Day by publishing several articles on our new IFDC Perspectives *blog. Below is Part 1 of our three-part blog series.*

Sustainable Farming – Good for Smallholders, Good for the Earth

A Development-Minded View of Earth Day 2014: Part 1

As this year's Earth Day celebrations continue throughout the month, I'm reminded of the gap between those with #FirstWorldProblems and those who go to bed wondering about tomorrow's meals. Earth Day has raised awareness of previously overlooked issues and is changing the way first-world populations live. However, we must remember that those living in constant need can have the greatest positive environmental impact. These are the smallholder farmers around the world.

Smallholders do not have to be the victims of our environmental failures – they can be the heroes. When smallholders adopt sustainable farming techniques, they change the world. Not only do they help preserve natural resources, these decisions are environmentally sound, so we thrive, not simply survive.

For example, Bangladeshi farmers using fertilizer deep placement, an environmentally sustainable fertilizer technology, have experienced a 284 percent gross margin increase over those farmers using traditional fertilizer techniques. Where once they only made $71 per hectare of land, many are making $273 per hectare.

Increasing local prosperity helps fuel national economies and encourages an entrepreneurial spirit. So many times, smallholders are treated as the victims. Instead we should emulate their resilience, their leadership and their headstrong determination. Farmers are changing their traditional techniques, bettering themselves and the world around them. They're certainly not simply victims of climate change – they're our teachers and our heroes. ■

To read more from our blog, go to http://www.ifdc.org/Media_Center/IFDC-Perspectives.

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Alleviating Climate Change – One Farmer at a Time:
5 Ways Smallholder Farmers Can Reduce and React to Climate Change Impact

IFDC International Trainings – Why Should I Go?
This blog explains how IFDC's international training programs can be right for you.

Read the full blogs at http://www.ifdc.org/Media_Center/IFDC-Perspectives.

Latest VFRC Publications

Recently, the Virtual Fertilizer Research Center, IFDC's fertilizer research initiative, partnered with Wageningen University and Research Centre and the Nutrient Management Institute to add two reports to its growing list of baseline studies. These reports serve to compile and analyze known knowledge on plant nutrients and will help the VFRC determine appropriate research paths. They are available for download at www.vfrc.org/Research/VFRC_Reports.

VFRC Report 2014/2: Eliminating Zinc Deficiencies in Rice-Based Systems

Zinc (Zn) deficiency in crop production and in human populations is a widespread and serious problem, especially in rice-based systems. This report presents an overview of Zn, how it works in the soil, its uptake by plants and its mobility within a plant. The report discusses everything from the behavior of Zn as a fertilizer to Zn as a human nutrient, providing leads as to how Zn nutrients can be best applied to rice – involving biofortification and other strategies.

The report was written in co-operation with Wageningen University and Research Centre.

Citation: A. Duffner, E. Hoffland, T.J. Stomph, A. Melse-Boonstra and P.S. Bindraban, 2014. Eliminating Zinc Deficiency in Rice-Based Systems. VFRC Report 2014/2. Virtual Fertilizer Research Center, Washington, D.C. 35 pp.; 1 table; 5 figs.; 1 text box; 200 ref.

VFRC Report 2014/3: Selenium Fertilization: An Agro-Ecosystem Approach

Selenium (Se) is an essential micronutrient with 0.5 to 1 billion people experiencing major health problems due to deficient intake. This report identifies factors for developing a tool to determine effective application of Se fertilizer. Analysis reveals that several factors determine Se uptake, but that basic agronomic practices can enhance uptake efficiency up to 50 percent. Foliar (spray) application of Se appears to be more efficient than soil application, while biofortification is effective for health improvement, but is out of reach for those who are most in need of the nutrient.

The report was written in cooperation with the Nutrient Management Institute.

Citation: G.H. Ros, A.M.D. van Rotterdam, G.D. Doppenberg, D.W. Bussink and P.S. Bindraban, 2014. Se Fertilization: An Agro-Ecosystem Approach. VFRC Report 2014/3. Virtual Fertilizer Research Center, Washington, D.C. 62 pp.; 1 table; 21 figs.; 282 ref. ■

Upcoming Speaking Engagements

Prem Bindraban, executive director of the VFRC, will be speaking at the following engagements:

July 3, 2014

Presentation at the IFS Summer Conference 2014, London: "Developing Game-Changing Fertilizer Technologies"

October 20, 2014

Second Keynote Address at the 16th World Fertilizer Congress of CIEC, Rio de Janeiro, Brazil: "Changing the Fertilizer Game"

IFDC is governed by a board of directors while the VFRC is governed by a board of advisors. Each board has representation from both developed and developing countries.

IFDC

Margaret Catley-Carlson, member of the IFDC board since 2006, delivered plenary addresses linking water re-use and agriculture for the BioVision Alexandria Conference 2014 in Egypt, for Alberta Rural WasteWater in Calgary and for OzWater 2014 in Brisbane. Following an International Food Policy Research Institute (IFPRI) board meeting, she chaired a Ministerial session at the IFPRI 2020 conference in Addis Ababa, Ethiopia, on May 16 on "Building Resilience for Food & Nutrition Security." She also attended a board meeting of the International Centre for Integrated Mountain Development in Nepal on resilience in mountain communities and a meeting of the UN Secretary-General Advisory Board on Water and Sanitation in Singapore on wastewater/agriculture crossovers.

Josué Dioné, Senior Adviser of African Union (AU) Commissioner Rhoda Peace Tumusiime, spoke at a meeting of 15 English-speaking African Least Developed Countries (LDCs) April 14-17 to discuss National Adaptation Plan requirements, which aim to address the long-term climate change challenges for Africa. Within the framework of the AU Year of Agriculture and Food Security, Dioné facilitated the deliberations of the Input Policy Work Stream at the 10th Comprehensive Africa Agriculture Development Programme (CAADP) Partners Platform Meeting during March 18-22. He led the preparation, presentation and discussion of the Market and Trade Subtheme at the AU Joint Conference of Ministers of Agriculture, Rural Development, Fisheries and Aquaculture held April 28 - May 2, 2014.

Participating in a Joint Conference of Ministers responsible for Agriculture, Rural Development, Fisheries and Aquaculture in Addis Ababa, Ethiopia, in May, **Agnes Kalibata**, Rwanda's Minister of Agriculture and Animal Resources, organized a meeting with African Ministers responsible for agriculture from several countries that are already implementing CAADP. Kalibata reflected on Rwanda's plan for CAADP cycle II and shared her country's experiences as an example for other countries adopting CAADP. Kalibata also participated in a discussion on ending extreme poverty with USAID Administrator Rajiv Shah during the Chicago Council Global Food Symposium.

Steven Leath, President of Iowa State University, spoke at the Cultivation Corridor initiative unveiling event on April 21. The initiative is a strategic convergence of world-class agribusiness, agbioscience, biotechnology, biorenewable and related advanced manufacturing thriving on the unique set of lifestyle, labor and environmental conditions found throughout central Iowa, United States.

M. Peter McPherson, Chairman of the board of IFDC for the last decade and President of the Association of Public and Land-Grant Universities, commented in connection with the dedication of the statue for Green Revolution pioneer Dr. Norman E. Borlaug in the U.S. Capitol building in March. The event was held on what would have been Borlaug's 100th birthday. Borlaug received the Nobel Peace Prize in 1970 for his contribution to the world food supply and was appointed to IFDC's board of directors in 1994. McPherson shared memories about working with Borlaug tracing back to when McPherson was the administrator of USAID in the 1980s.

With the official launch of 2014 as the Year of Agriculture and Food Security in Africa by African Heads of State, AU Commissioner **Rhoda Peace Tumusiime** has been actively engaged in a series of activities, starting with the 10th CAADP Partnership Platform Meeting, held in March 2014 in Durban, South Africa. The meeting was organized by the African Union Commission and New Partnership for Africa's Development Planning and Coordinating Agency to review progress and synthesize lessons for the way forward. On April 4, the Commissioner delivered a special address on "ICT for Agriculture: The Digital Springboard for Inclusive Agriculture" at the 4th EU-Africa Partnership Meeting in Brussels. She also organized the Joint AU Conference of Ministers responsible for Agriculture, Fisheries and Aquaculture and Rural Development. Over 50 ministers gathered in Addis Ababa from April 28 to May 2 to deliberate on the theme, "transforming Africa's agriculture for shared prosperity and improved livelihoods through harnessing opportunities for inclusive growth and sustainable development." The ministers committed to doubling the current level of annual growth in agricultural "total factor productivity" by 2025.

VFRC

In April, **Satish Chander**, Director General of the Fertiliser Association of India (FAI) and member of the VFRC board of advisers, stressed the need to change the fertilizer policy situation in India during a meeting of FAI's southern regional committee. Chander said that the government's urea policy results in overuse of the highly subsidized fertilizer.

Juergen Voegele, Director of Agriculture and Environmental Services at the World Bank, participated in the Global Oceans Action Summit for Food Security and Blue Growth. According to Voegele, "With public-private partnerships and shared approaches, we can restore ocean health and provide food and jobs for communities worldwide."

Victoria Antoine, graphic artist, and **Heather Gasaway**, graphic artist/web designer, attended the Photoshop World East conference in Atlanta, Georgia, to learn about the latest advances in digital media and photography.

Prem Bindraban, executive director of the VFRC, participated in the 2014 International Fertilizer Association (IFA) Global Technical Symposium in Amsterdam, the Netherlands. He gave a presentation on "Fundamental Biological Insights for Fertilizer Solutions."

Kofi Debrah, chief of party of the USAID West Africa Fertilizer Program; **Sarah Gavian**, chief economist and program leader – markets and economics; **Joshua Ariga**, scientist – economics; and **Maria Wanzala**, senior policy economist seconded to NEPAD, attended the African Union CAADP Partners Platform Meeting in Durban, South Africa. The meeting focused on progress toward accelerating economic growth through agriculture-led development.

Edo Lin, chief of party of the Feed the Future USAID Agriculture Technology Transfer project, attended a workshop organized by the World Initiative for Soy in Human Health (WISHH) in Ghana. WISHH's mission is to create commercially sustainable solutions and opportunities for U.S. soy protein by improving the health and nutrition of people in developing countries by addressing protein deficiencies.

Job Fugice, coordinator – analytical services, attended a training program on the Decision Support System for Agrotechnology Transfer (DSSAT) at the University of Georgia. DSSAT is a software application program that comprises crop simulation models for over 28 crops.

Yam Gaihre, post-doctoral soil scientist, participated in two workshops on agricultural greenhouse gas (GHG) emissions in Paris, France. The workshops analyzed models that simulate GHG emissions, particularly nitrous oxide, from arable crops and from grasslands. Gaihre gave a presentation on "Quantifying N-Emissions Losses With Water and Nitrogen Management From Rice Paddy Fields." His presentation highlighted the effects of alternate wetting and drying and urea deep placement on emissions and their mitigation potential. The events were organized by the Global Research Alliance on Agricultural Greenhouse Gases and the Joint Research Programming Initiative on Agriculture, Food Security and Climate Change. The French National Institute for Agricultural Research hosted the workshops.

Olivia Gist, geographic information systems (GIS) specialist, and **Emily Wright**, specialist – market information and program support, attended The Fertilizer Institute's Economics Council Spring 2014 meeting in Clearwater, Florida.

Peter Heffernan, director of the Office of Programs, attended the IFA Annual Conference in Sydney, Australia. The conference focused on nutrient stewardship and nutrient use efficiency.

Ishrat Jahan, resident representative in Bangladesh and AAPI chief of party, attended a workshop on "Addressing Gender and Assets in Agricultural Development Projects," organized by the International Food Policy Research Institute (IFPRI) in New Delhi, India. The workshop served as a forum for IFPRI to receive feedback in the design and implementation of development projects that work to reduce the gender gap in men's and women's use, control and ownership of assets.

Arno Maatman, 2SCALE chief of party, participated in a national cluster/corridor conference organized by Synergos and the Ethiopia Agricultural Transformation Agency in April. Maatman gave a presentation on "Agri-business Clusters and Inclusive Economic Growth." **Addis Teshome**, 2SCALE cluster adviser, also attended the event.

Amit Roy, IFDC president and CEO, participated in a steering committee meeting for the Global Partnership for Nutrient Management in Bhubaneswar, India. He also made a presentation on fertilizer deep placement during the Norman Borlaug Birth Centenary Dialogue "Take It To the Farmer" at the M.S. Swaminathan Research Foundation in Chennai, India.

Willem Selen, IT and M&E consultant; **Medinah Zubairu**, data logistics and GIS officer; and **Janet Nabwani**, researcher, attended a World Soil Information (ISRIC) training course for soil mappers and soil scientists. The program covered world soils, soil databases, software for soil data analysis and visualization, digital soil mapping and soil-web services.

Working at IFDC

Due to the Center's growing number of projects and activities around the globe, IFDC regularly seeks experts to fill new positions. Below are selected positions that are available at the time of this issue's printing.

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United States

Managing Librarian
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United States

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Director, Eurasia Division
Dhaka, Bangladesh

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Abuja, Nigeria

Chief of Party, West Africa Cotton Partnership Program
Ouagadougou, Burkina Faso

Deputy Chief of Party, Bangladesh
Dhaka, Bangladesh

Project Development Officer
Washington, D.C.
United States

Team Leader/Input Supply Specialist – FED
Monrovia, Liberia

To see all available positions, visit https://ifdc.silkroad.com/.

Parting Shot

Elijah Muremi is a member of the Majembeni Young Fathers Group in Majembeni, Kenya. The men grow maize on communal land for local markets and large-scale granaries. Their profits have enabled them to expand into vegetable farming and other enterprises. With the additional income, the young fathers now support all of their families' needs. Photo by Joanne Lewa, USAID Kenya.

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ISSN 0149-3434

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2014 International Training Calendar

Training Program/Workshop/Study Tour	Dates	Location	Program Fee
Linking Farmers to Markets in Africa (French Edition)	July 7-11	Bamako, Mali	$1,500
Technology Advances in Agricultural Production, Water and Nutrient Management	August 18-29	Alabama, Tennessee, Missouri, Arkansas, Iowa and Washington, D.C. (United States)	$2,200
Fertilizer Blending Opportunities and Constraints	October 6-10	Nairobi, Kenya	$1,500
Granular Fertilizers Production	November 3-7	Bangkok, Thailand	$1,900
Promoting Innovative Composting Alternatives of Agricultural and Municipal Waste	November 24-28	Accra, Ghana	$1,500
Agricultural Market Information Systems and ICT Platforms for Business Management Across the Value Chain	December 8-12	Nairobi, Kenya	$1,500