IFDC Corporate Report, 2005/06

"Let us generate a uniquely African Green Revolution..."

Kofi Annan, UN Secretary General

"Nourish the Soil, Feed the Continent"

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Theme: Nourish the Soil...Feed the Continent

President Olusegun Obasanjo of Nigeria said in his opening remarks at the Africa Fertilizer Summit, "To feed our people, we must first feed the soil."

Acronyms

ABMC—Association and Business Management Center (Albania)
AFA—Arab Fertilizer Association
AFAMIN—African Agricultural Market Information Network
AfDB—African Development Bank
AFDI—French Farmers and International Development
AIDTDP—Agricultural Input Dealer Training and Development Project
AIMS—Agricultural Input Markets
AISSA—Agricultural Intensification in Sub-Saharan Africa
AMPS—Agricultural Marketing and Production Support
ANMAT—Adapting Nutrient Management Technologies
APCAM—Permanent Assembly of Chambers of Agriculture (Mali)
APEP—Agricultural Productivity Enhancement Program (Uganda)
BARC—Bangladesh Agricultural Research Council
BKFSH—Albanian National Farmers Union
BSAIDD—Batken and Sughd Agri-Input Dairy Development
CAADP—Comprehensive Africa Agriculture Development Program
CAM—Committee of Horticultural Activities
CARE—Cooperative for Assistance and Relief Everywhere
CASE—competitive agricultural systems and enterprises
CGIAR—Consultative Group on International Agricultural Research
CIAT—International Center for Tropical Agriculture
CIMMYT—International Maize and Wheat Improvement Center
CLUSA—Cooperative League of the United States of America
CNFA—Citizens Network for Foreign Affairs
CPIDS—Cereal Production Information and Decision Support System
CPPs—crop protection products
CPS—commodity production sites
CSD—Combating Soil Fertility Decline to Implement Smallholder Agricultural Intensification in Sub-Saharan Africa
CSM—crop simulation model
DAIMINA—Developing Agricultural Input Markets in Nigeria
DAP—diammonium phosphate
DFID—Department for International Development
DGIS—Directorate General for Development Cooperation
DSS—decision support system
EAC—East African Community
ECA—Economic Commission for Africa
ECOWAP—Economic Community of West African Agricultural Policy
ECOWAS—Economic Community of West African States
EDP—Enterprise Development Project
EU—European Union
FACIA—Federation of African Agricultural Input Trade Associations
FAO—Food and Agriculture Organization of the United Nations
FARA—Forum for Agricultural Research in Africa
FARMS—Food for Agricultural Revitalization and Market Systems
FASEPE—Favorable Socioeconomic and Policy Environments for Soil Fertility Improvement
FDP—Fertilizer Deep Placement
FfF—Farmers for the Future Project
FFP—Food for Progress
FSAD—Syngenta Foundation for Sustainable Agriculture
GAIDA—Ghana Agricultural Input Dealers' Association
GAIMS—Ghana Agricultural Input Market Strengthening
GAPTO—Ghana Agricultural Producers' and Traders' Organization
GEF—Global Environment Facility
GIS—Geographic Information System
IAEA—International Atomic Energy Agency
IAR—Institute for Agricultural Research (Nigeria)
IARC—International Agricultural Research Center
ICARDA—International Center for Agricultural Research in the Dry Areas
ICRA—International Center for Development-Oriented Research in Agriculture
ICRISAT—International Crops Research Institute for the Semi-Arid Tropics
ICS—Industries Chimiques du Senegal
IDE—International Development Enterprises
IDSS—information decision support system
IFA—International Fertilizer Industry Association
IFAD—International Fund for Agricultural Development

Note: Mention of sub-Saharan Africa in this report does not include South Africa.

Acronyms (continued)

IFPRI—International Food Policy Research Institute
IITA—International Institute for Tropical Agriculture
INERA—Institute for the Environment and Agricultural Research
ISFM—integrated soil fertility management
JAC—Joint Action Committee
KAED—Kyrgyz Agro-Input Enterprise Development Project
LEAA—Livestock Entrepreneurs Association of Albania
MAAHF—Ministry of Agriculture, Animal Health, and Food (Afghanistan)
MAPI—Mali Agricultural Production Initiative
MARKETS—Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites
MIR—Marketing Inputs Regionally
MIS—market information system
MISTOWA—Market Information Systems and Traders' Organizations in West Africa
MMIS—Market and Management Information Systems
MoCN—Ministry of Counter Narcotics (Afghanistan)
MRRD—Ministry of Reconstruction and Rural Development (Afghanistan)
NAFCON—National Fertilizer Company of Nigeria, Ltd.
NARES—national agricultural research and extension systems
NARS—national agricultural research systems
NCST—national capacity strengthening teams
NEPAD—New Partnership for Africa's Development
NGOs—nongovernmental organizations
NPK—nitrogen, phosphorus, potassium
NRM—natural resource management
PDES—Livestock Development Program of the Soum Province, Burkina Faso
PDRSO—Southwest Burkina Faso Development Project
PR—phosphate rock
PRDSS—phosphate rock decision support system
PRODEPAM—Program for the Development of Agricultural Production in Mali
PTM—Policy, Trade, and Markets Program
RAFIA—Research, Support, and Training for the Initiatives of Self Development
RAMP—Rebuilding Agricultural Markets in Afghanistan Program
RESIMAO—Network of West African Market Information Systems
ROESAO—West African Network of Economic Operators in the Food Industry
ROPPA—Network of Farmer Organizations and Agricultural Producers of West Africa
SAADA—Strategic Alliance for Agricultural Development in Africa
SADC—Southern African Development Community
SCOSA—Sustainable Commercialization of Seed in Africa
SIMFIS—Simulation Mixed Farming in the Sahel
SNDP—Soil and Nutrient Dynamics Program
SPFS—Special Program on Food Security
TSBF—Tropical Soil Biology and Fertility Institute
UDP—urea deep placement
UEMOA—West African Economic and Monetary Union
UN—United Nations
UPA/DI—Union of Agriculture Producers/Development International
USAID—U.S. Agency for International Development
USDA—U.S. Department of Agriculture
USG—urea supergranules
WOTHRO—Foundation for the Advancement of Tropical Research (Netherlands)
WSP—water-soluble phosphate
WTO—World Trade Organization

Message From the Board Chairman and the President and Chief Executive Officer

Nourish the Soil...
Feed the Continent

Partnerships: The Key to Making Things Happen

No single institution can resolve the complex issues of agricultural development. Partnerships with other organizations that have experience and expertise are essential for the transfer of technology, and for market development. Our partners include national and regional agricultural institutions, the private sector, other international research agencies, and donors. All are partnering to serve one ultimate partner: the smallholder farmer.

Four examples of such alliances over the past year include:

- *Implementing the Africa Fertilizer Summit in Abuja, Nigeria, in June 2006. To make that happen, IFDC worked with the New Partnership for Africa's Development (NEPAD), the African Union, African farmer and input dealer organizations, the Government of Nigeria and 40 other African nations, The Rockefeller Foundation, and many other sponsors.*
- *Initiating the Strategic Alliance for Agricultural Development in Africa with the Dutch Government in 2006. Through the alliance, and in partnership with a host of local organizations, the Competitive Agricultural Systems and Enterprises (CASE) approach will be scaled up in West Africa, and extended to other critical regions of Africa.*
- *Designing and implementing a national agricultural input support program in Afghanistan by partnering with the U.S. Agency for International Development, the U.K.'s Department for International Development, the Government of Afghanistan, and private sector suppliers of agricultural inputs. The synergy provided a market-friendly approach, using vouchers, to supply agri-inputs to help about 700,000 Afghan farmers earn a living from licit crops.*
- *Conducting leading-edge research in the IFDC pilot plant and labs to help develop products that increase the demand for, and efficient use of, plant nutrients. For this IFDC works with a range of firms, from start-ups to multinationals.*

The Africa Fertilizer Summit was one of the largest meetings in history to focus on Africa's food problem. Heads of state and governments called for elimination of all taxes and tariffs on fertilizer in the historic Abuja Declaration on Fertilizer for an African Green Revolution. Summit participants also agreed on 12 resolutions designed to increase fertilizer use by five times in 10 years in the Abuja Declaration.

The Summit has opened new windows of opportunity for agencies to address the complex issues of removing yield constraints and improving soil fertility and food security in Africa. All stakeholders realize that urgent, comprehensive, and long-term actions are needed if Africa is to restore soil health and feed its burgeoning population.

The obstacles to agricultural development in Africa are enormous and long-standing. Human, institutional, and research capacity, as well as physical infrastructure, must be built to enable Africa to compete effectively. Policies should be changed to encourage business and investment. Furthermore, as history has demonstrated, countries must take charge of their own futures if they are to build better futures for their children.

IFDC wants to help partner agencies achieve key development objectives, including the promotion of integrated soil fertility management, and improved farmer access to agricultural inputs—and the technologies they embody. IFDC will work with partners at all levels to:

- *Build human and institutional capacity by training private sector input dealers and establishing trade associations.*
- *Help countries take charge of their futures by providing advice and demonstrating best practices such as smart subsidies, and increasing competition and transparency through market information systems.*
- *Encourage regional economic communities to improve harmonization of policies and regulations and thus, increase intraregional trade.*

IFDC can draw on experience in Albania, Afghanistan, Bangladesh, the Central Asian Republics, and elsewhere that can be shared with partners in Africa. Examples include the voucher system for inputs introduced in Afghanistan; reforms in fertilizer distribution and deep placement urea technology for rice in Bangladesh; the pioneering development of trade associations and commodity chains in Albania; the commodity auction and credit systems used in Albania, Kosovo, and now Afghanistan; and the decision support systems and crop modeling being designed for farmer use in North Africa and the Near East.

The coming year promises to be an exciting period for expanding IFDC partnerships to serve smallholder farmers.

M. Peter McPherson
Chairman, IFDC Board of Directors

Amit H. Roy
IFDC President and CEO

Highlights of the Africa Fertilizer Summit

Africa Fertilizer Summit
9–13 June 2006 ▲ Abuja, Nigeria
Nourish the soil, feed the continent.

The Call for an African Green Revolution

UN Secretary General Kofi Annan, at a July 5, 2004, meeting of food security specialists in Addis Ababa, Ethiopia, pointed out that the Green Revolution had tripled food productivity in Asia, but…

> *Africa has not yet had a Green Revolution of its own.*

The Secretary General then called for a strategy to bring food security to Africa:

> *Let us generate a uniquely African Green Revolution—a revolution that is long overdue, a revolution that will help the continent in its quest for dignity and peace…Given the right kind of national and international support, Africa can achieve the 21st century Green Revolution that it needs…And let us never again allow hunger—needless hunger—to ravage lives and the future of the continent.*

President Olusegun Obasanjo of Nigeria later repeated the call and pointed out *why* per capita food production in sub-Saharan Africa has decreased over the past three decades:

> *The main reason for Africa's food shortages is soil nutrient depletion. Africa loses about $4 billion worth of plant nutrients from its soils each year due to continuous cultivation without nutrient replenishment…We must feed the soil, that feeds the people...If Africa is to rapidly enhance its ability to feed itself, we need what the UN Secretary General Kofi Annan has called for—a uniquely African Green Revolution. This will require an increase in the use of fertilizer…Therefore, African governments have decided to take action to catalyze large-scale adoption of fertilizer.*

Subsequent calls for an African Green Revolution were from Nobel Peace Prize Laureate Dr. Norman Borlaug, President of the Sasakawa Africa Association; and former U.S. President and Nobel Peace Prize Laureate Jimmy Carter of The Carter Center in Atlanta, Georgia, U.S.A.

Collective voices such as these led to the Africa Fertilizer Summit, to plan the African Green Revolution.

Global Leaders Call for an *African Green Revolution* at Africa Fertilizer Summit

The *Abuja Declaration* calls for lifting all taxes and tariffs on fertilizer

"Nourish the soil, feed the continent"

Heads of state and governments of more than 40 African nations called for an *African Green Revolution* and declared both mineral and organic fertilizers a "strategic commodity without borders"—meaning that all cross-border taxes and tariffs should be lifted—in the *Abuja Declaration on Fertilizer for an African Green Revolution*.

The historic document was written at the conclusion of the Africa Fertilizer Summit, an African-led initiative held June 9-13, 2006, in Abuja, Nigeria. The Summit's theme was "Nourish the soil, feed the continent."

The Summit's 1,100 participants included 5 African heads of state, 15 ministers of agriculture, 17 members of the Summit's Eminent Persons Advisory Committee, and hundreds of leaders of international organizations, agricultural research centers, and private sector companies.

The Second Technical Advisory Committee meeting was held in Abuja, February 8-10, 2006. Left to right are: Dr. Akin Adesina, Rockefeller Foundation; Dr. Amit Roy, President, IFDC; Hon. Mallam Adamu Bello, Minister of Agriculture and Rural Development, Nigeria; and Prof. Richard Mkandawire of NEPAD.

"Due to decades of soil nutrient mining, Africa's soils have become the poorest in the world," the *Abuja Declaration* states. "A move toward reducing hunger in Africa must begin by addressing its severely depleted soils. It is estimated that the continent loses the equivalent of over $4 billion worth of soil nutrients per year…Yet farmers have neither access to nor can they afford the fertilizers needed to add life to their soils. And no country in the world has been able to expand agricultural growth rates, and thus tackle hunger, without increasing fertilizer use."

The *Abuja Declaration* also calls for the African Development Bank (AfDB) to establish an "African Fertilizer Development Financing Mechanism" to support regional fertilizer procurement and distribution facilities, provide credit for fertilizer importers and distributors, and develop local fertilizer manufacture in Africa.

To catalyze startup, Nigerian President Olusegun Obasanjo committed $10 million to the fund. The African Union Member States agreed to pledge additional funding.

"It's Africa's time"

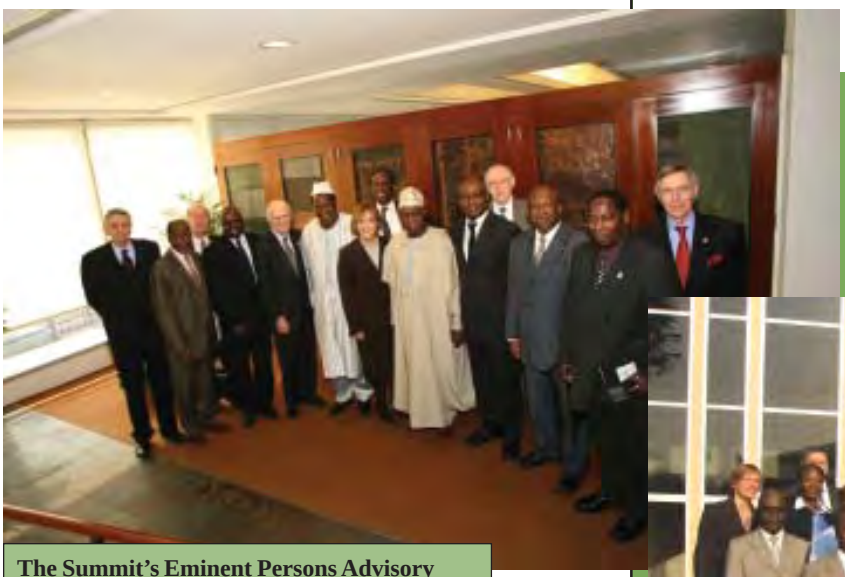
"It's Africa's time. The African Union strongly commits itself to these concrete action plans to end Africa's soil fertility crisis."
—Alpha Konare, President of the African Union Commission

"Africa's leaders are ready and we will solve this crisis."
—Denis Sassou-Nguessou, Former President of the Republic of Congo and Chairman of the African Union

"This august gathering…heralds a crucial milestone in our quest to rapidly reverse our low agricultural productivity and accelerate food productivity for our people."
—Olusegun Obasanjo, President, Federal Republic of Nigeria

"We believe in the tremendous potential of an African Green Revolution. But to make it a reality will require the collaboration of national governments, the private sector, and the donor community. The need is great, and the time is right. We at the Rockefeller Foundation stand ready to offer our best help."
—Judith Rodin, President, The Rockefeller Foundation

"The Africa Fertilizer Summit deserves the fullest support of leaders of Africa."
—Adamu Bello, Minister of Agriculture and Rural Development, Nigeria



The Summit's Eminent Persons Advisory Committee met at the Rockefeller Foundation headquarters in New York City on March 30, 2006.

Participants at the Second Technical Advisory Committee meeting.

The Rockefeller Foundation and the Green Revolution

The Rockefeller Foundation's foresight, energy, and financial support made possible this strategic Summit, which is catalyzing the African Green Revolution that the continent so desperately needs, and deserves. This is fitting; the Foundation provided the vision and support that triggered the Asian Green Revolution, which may feed 1 billion people today. Once again, the Rockefeller Foundation is helping make history—and IFDC is proud to be its partner in this pioneer initiative.

—Amit Roy
IFDC President and CEO

The Technical Committee meeting included a press briefing. Holding the microphone is Hon. Adamu Bello, Minister of Agriculture and Rural Development, Nigeria. To his right is Ms. Ama Pepple, Permanent Secretary of Agriculture, Nigeria.

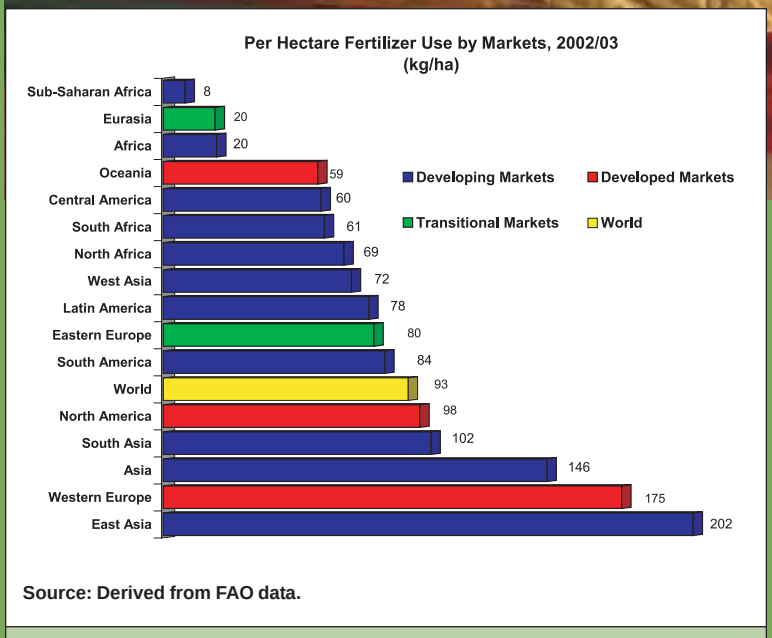


Figure 1. Farmers in sub-Saharan Africa use only about 8 kg/ha of fertilizer yearly. The world average is 93 kg/ha and Green Revolution countries of Asia use 100 to 200 kg/ha.

Fertilizer use in sub-Saharan Africa is the world's lowest, averaging only 8 kg/ha yearly (Figure 1). The African Union states resolved to increase fertilizer use to at least 50 kg/ha by 2015 in the Abuja Declaration. That would increase production by no less than 25%.

"Cereal yields in Africa have stagnated at about 1 ton per hectare for the past three decades, and per capita food production has decreased," said Dr. Amit Roy, IFDC President and CEO (Figure 2). "In contrast, food production has increased dramatically in the 'Green Revolution' countries of Asia, where farmers use from 80 to more than 150 kg of fertilizer per hectare."

The dramatic increases in agricultural production in Asia were mostly through higher yields, but Africa's far lower increase has been mainly through expansion of land area (Figure 3).

The Summit was the largest and most comprehensive effort ever to address Africa's agricultural crisis. It was convened by the African Union's New Partnership for Africa's Development (NEPAD), with strong backing from the Government of Nigeria, the Rockefeller Foundation, and other donors. The Federal Republic of Nigeria hosted the Summit, which was chaired by President Obasanjo, who also chairs NEPAD's Implementation Committee. IFDC implemented the Summit.

Action! Not talk

Fertilizers are crucial to any strategy to improve farm production in Africa. With 65% of its labor force in agriculture, Africa's low productivity means endless poverty, reliance on food imports, few financial investments, and finally, political instability…

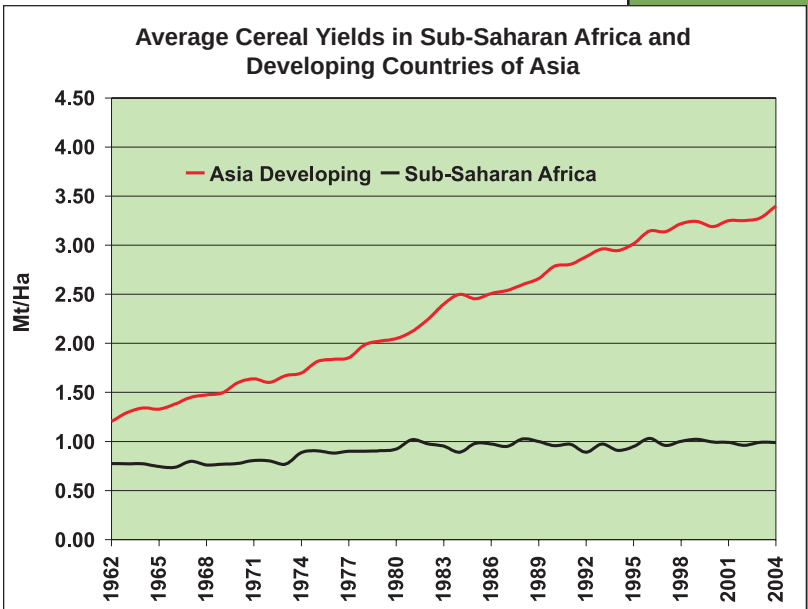


Figure 2. Cereal yields in sub-Saharan Africa have stagnated for 40 years, while yields in Asia have tripled.

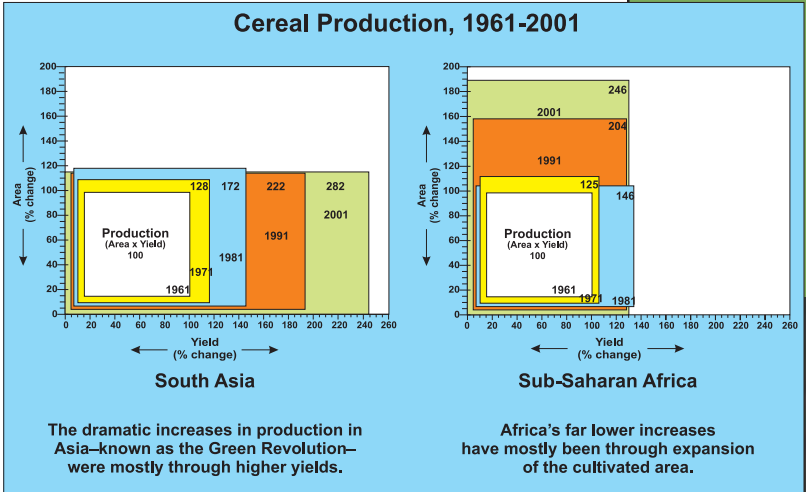


Figure 3. Asia's production increases were mostly through higher yields. Africa's increases have been by bringing more land into production.

The Africa Fertilizer Summit emerges from new dynamism in the continent, with greater emphasis on agriculture, policies that foster the private sector, and a need to utilize the continent's fertilizer resources. It will strongly contribute to the goals of the Comprehensive Africa Agriculture Program of the African Union's NEPAD. NEPAD has set an ambitious goal of raising agricultural production by 6% annually as a necessary step toward halving poverty by 2015—the first UN Millennium Development Goal.

Achieving this and a prosperous and peaceful Africa is not only in our interest—it is also our responsibility.

—Marjatta Eilittä, IFDC Senior Agronomist,
Achieving an African Green Revolution

The Summit was held in Abuja's modern International Conference Centre.

Soil Nutrient Mining

Traditionally, African farmers have practiced "slash-and-burn" farming. Farmers cleared new land, planted and harvested crops for about 3 years, then left the land fallow and moved on to clear more land. About 10 years later, farmers returned to clear and farm the fallow land again. By then, the basic soil fertility had been restored. The system was low-yielding but fairly sustainable…30 or 40 years ago, when Africa had fewer people.

But population pressure now forces farmers to grow crop after crop on the same land. The soils are being "mined"—nutrients are removed as low-yielding crops, with almost no nutrients returned. Little organic matter is returned to the soil; farm families use maize and cotton stalks, and rice stems, as fuel or fodder.

"What happens if you continuously remove nutrients from the soil?" Amit Roy said. "It's the same as if you continuously take money out of your checking account without putting money back in. Ultimately, you'll have no money. The same thing is happening in the soils of sub-Saharan Africa, where the farmers continuously mine the soil without replenishing with external inputs."

Agricultural leaders from across Africa and worldwide met in Abuja, Nigeria's new and modern capital, for the Africa Fertilizer Summit.

The precipitous decline in Africa's soil health from 1980 to 2004 was documented in the IFDC technical report *Agricultural Production and Soil Nutrient Mining in Africa,* by Dr. Julio Henao, IFDC Biometrician, and Dr. Carlos Baanante, IFDC Economist. The report was a key background paper for Summit participants.

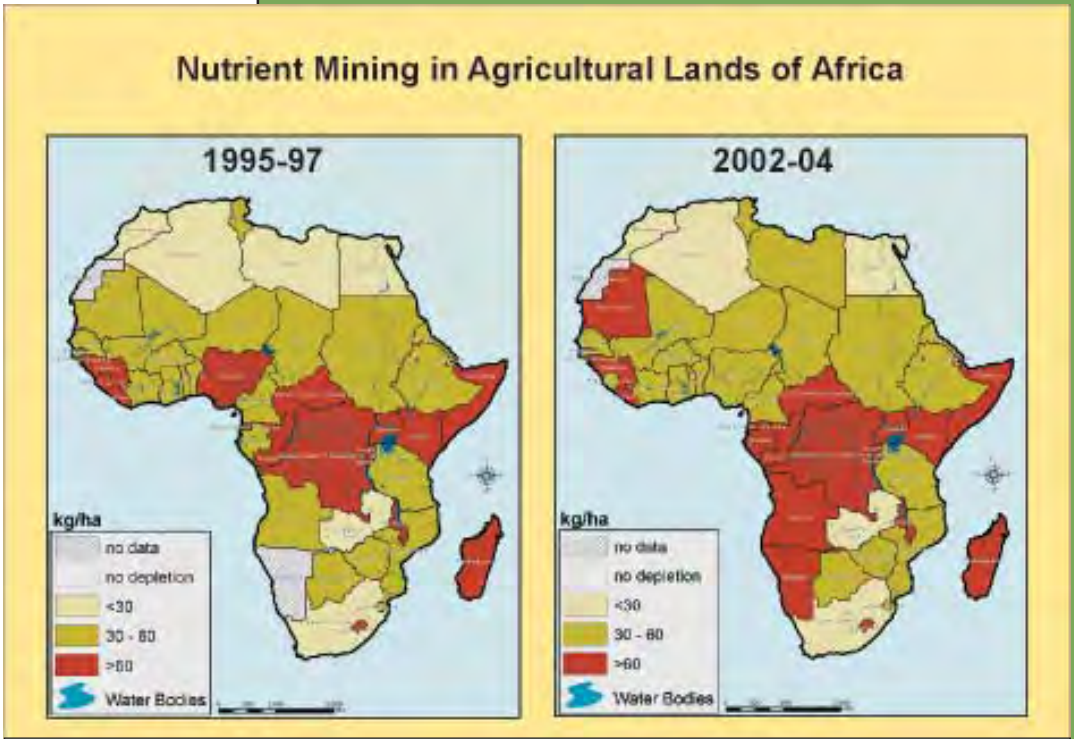


Figure 4. About 75% of the farmland in sub-Saharan Africa is severely degraded by soil nutrient mining. Africa loses $4 billion worth of soil nutrients every year.

The new research shows a substantial decline in soil health across sub-Saharan Africa, with the highest rates of nutrient depletion—more than 60 kg/ha yearly—in Guinea, Congo, Angola, Rwanda, Burundi, and Uganda. Those countries comprise 40% of the region's farmland (Figure 4).

About 33% of sub-Saharan Africa's population is undernourished, and most of the undernourished live in East Africa, where nutrient mining rates are high.

"The evidence leaves no doubt that the very resources on which African farmers and their families depend for welfare and survival are being undermined by soil degradation caused by nutrient mining and associated factors such as deforestation, use of marginal lands, and poor agricultural practices," Henao and Baanante wrote.

Even Modest Fertilizer Use Increases Farm Yields Dramatically

Using fertilizer, improved seed, and other practices, 1,000 farmers in Sauri, Kenya, more than tripled their last maize harvest, reported Dr. Pedro Sanchez, Director of Tropical Agriculture at the Earth Institute at Columbia University, U.S.A. Sanchez presented evidence on farm productivity in "millennium villages" in Kenya, Ethiopia, and Malawi. The villages, which are part of the United Nations Millennium Project, combine community participation and the best of science to end poverty and hunger.

In Sauri, the average yield rose from 1.5 tons/ha to 4.9 tons, and farmers returned 10% of their surplus to school feeding programs. Grain production of maize, teff, sorghum, and barley increased nine times in Koraro, Ethiopia. As yields increase, farmers diversify to new crops, Sanchez reported.

"Fertilizer is as important to combating hunger as insecticide-treated mosquito bed nets are in controlling malaria," Sanchez said. "Beginning with getting these basic tools of agriculture into farmers' hands, we are working on the transformation of subsistence farmers into small-scale entrepreneurs."

Food Imports Soaring

Africa now imports about 19 million tons of cereal grains per year, at a cost of $3.5 billion, Henao points out. If soil erosion and nutrient loss continue at the current rate, crop yields in Africa will decline by as much as 30% by 2020. This will lower total cereal, root and tuber, and legume production by about 26 million tons yearly. Meanwhile, Africa's population is projected to increase from today's 750 million to 1.1 billion people. Imports will be 34 million tons, costing $8.4 billion…in a region where half the population today lives, somehow, on about 65 cents a day.

One kilogram of nitrogen fertilizer will not only help replenish Africa's depleted soils, it will produce 10 to 15 kg of grain. About 3.5 million tons of fertilizer, at a cost of $1 billion, would produce that 34 million tons, and save $7.5 billion.

NEPAD CEO Concerned About Infrastructure

Professor Firmino Mucavele, CEO of NEPAD, said that agriculture accounts for 60% of Africa's labor force, but 28% of Africa's population is chronically undernourished. He called for improvement of rural infrastructure.

"Because roads are few and poor, transport costs account for at least 30% to 40% of the farmgate fertilizer price in Africa," Mucavele said. A ton of fertilizer that costs $150 in the United States can cost as much as $600 in landlocked African countries.

"Worsening the situation are weak input and output marketing systems that reduce economic incentives to use fertilizer," Mucavele said. "Thus, building rural input markets to give farmers access to affordable fertilizers is important. The environmental dimension of fertilizer use in Africa is not one of *over use* but of *under use."* He called for a rapid increase in fertilizer use not only "for higher food production" but also to "improve the health of our soils."

Crops Don't Grow on Air

The Rockefeller Foundation was one of the Summit's major sponsors. Dr. Akin Adesina, Rockefeller's Associate Director for Food Security, said, "I've been in international work for 20 years…and have never seen any region of the world that is suffering as much as Africa. Why is that? The crop varieties that can make the difference for rice, for maize—they are becoming available here in Africa. But none of these varieties grow on air. All need nutrients, they need fertilizers to grow. The average yield in Africa for maize is half a ton per hectare. In Latin America, we can get 10 tons/ha. American farmers get well over that. The reason is: African soils are dead. Just plain dead."

Mineral fertilizers are essential to restore soil fertility, Adesina said, but also needed are improvements in:

- *Access:* Measures are needed to improve the quantity and quality of agri-inputs available to the rural poor via the private sector.
- *Affordability:* The cost of agri-inputs must be lowered, so the rural poor can afford them.
- *Incentives:* Output markets must be improved to give farmers incentives to invest in inputs to restore soil health and raise production.

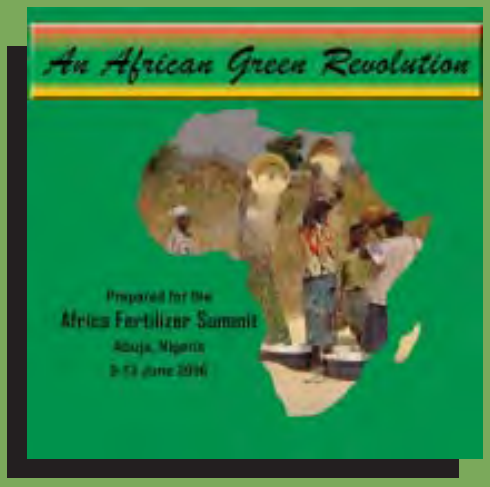
New DVD: *An African Green Revolution*

An African Green Revolution, a new IFDC DVD, was released at the Africa Fertilizer Summit.

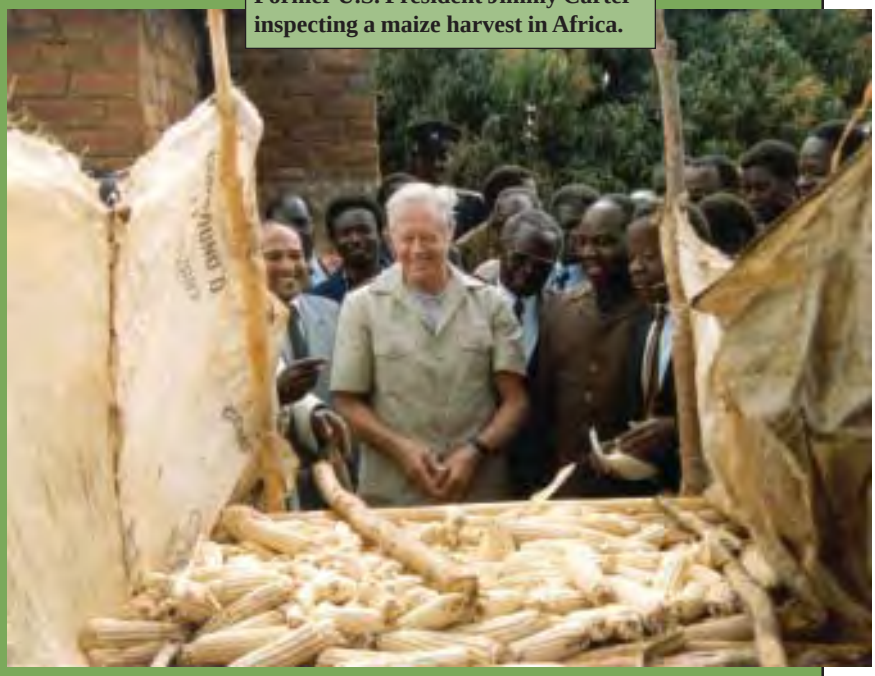
The 12-minute video addresses the same problems and potentials as the Summit: soil nutrient mining in sub-Saharan Africa; the need for both mineral and organic fertilizers to restore soil health; how the Green Revolution, which brought food self-sufficiency to Asia, bypassed Africa; the potential for an African Green Revolution; problems of getting affordable fertilizers to African farmers; and the potential for domestic fertilizer production.

The video includes UN Secretary General Kofi Annan's historic call for "a uniquely African Green Revolution." Also featured are Nigerian President Olusegun Obasanjo, Nobel Laureate Dr. Norman Borlaug, African farmers, and scientists concerned with soil fertility in Africa.

The video can be ordered, at reproduction and postage cost, at www.africafertilizersummit.org or www.ifdc.org.



Former President Jimmy Carter on Fertilizer and the Environment



Former U.S. President Jimmy Carter inspecting a maize harvest in Africa.

Former U.S. President Jimmy Carter addressed both Summit participants and heads of state, via a pre-recorded video.

"Nutrient-depleted soils are the greatest limitation to African agriculture," Carter said. "But efforts to improve soil health have been hampered by insufficient local capacity to produce fertilizer and the resources to import it.

"We now have the improved seeds to catalyze an African Green Revolution. But those seeds must have nutrients to produce the grain that Africa so desperately needs."

"Some worry about environmental consequences of fertilizer use in Africa," Carter continued. "But with sound management practices, the hungry soils of Africa will make almost all nutrients available to crops. In fact, the alarming mining of soil nutrients in Africa makes the use of mineral fertilizer environmentally friendly. The nutrients will...increase vegetative cover and reduce soil erosion."

In a field of maize in Africa are Nobel Peace Prize Laureates Dr. Norman Borlaug (left) and former U.S. President Jimmy Carter, and Rosalynn Carter. Borlaug is President of the Sasakawa Africa Association, and Carter was a founder of Sasakawa-Global 2000. Both organizations are deeply committed to ending hunger in Africa.

Nobel Laureate Norman Borlaug: "You can't eat potential!"

Dr. Norman Borlaug, Nobel Peace Prize Laureate and former IFDC Board member, addressed the Summit at its opening. Borlaug is best known for saving millions of people in Asia and Latin America from hunger through the initial Green Revolution. He has called improved seeds the "catalysts that ignited the Green Revolution," and mineral fertilizer the "fuel" that powers it.

Borlaug urged African agriculture ministers, politicians, and others to find

the political will to start an African Green Revolution by replenishing the continent's severely depleted soils.

The knowledge currently exists to set an African Green Revolution in motion, Borlaug said. What's missing is the "appropriate political will and economic policies."

Borlaug urged African leaders to implement economic policies that will facilitate fertilizer use by increasing the supply of fertilizer, strengthening markets, and making access more affordable.

"The potential is there—but you can't eat potential! You've got to convert it to grain and food!" Borlaug, 92, said.

Destruction of Forests and Wildlife

Borlaug also warned that, without healthy soils, Africa's agriculture will continue to stagnate, forcing mass migration to Africa's already teeming cities or the clearing of new land in fragile environments…the habitat of wild animals and plants.

About 110,000 additional hectares of Africa's forests and grasslands are cleared for farming yearly, according to the IFDC nutrient mining report.

"There will be environmental costs," Borlaug said in a separate video address, pointing out that nothing symbolizes our environment more than Africa's wildlife and forests.

The bison has virtually disappeared from North America, Borlaug said, adding, "And this will happen in the Serengeti Plains and other game parks in Africa, unless we learn to use the land suitable for agriculture to its full potential."

An agricultural input shop in Ghana.

Dr. Eric Smaling of Wageningen University, Netherlands, reported that African countries with higher fertilizer use have more abundant wildlife, using elephants as an example.

Food Aid Should be Limited

"Food aid should be strictly limited to cases where it is really needed, and then it must be organized in such a way that it neither spoils the market nor discourages local production," said Dr. Jan Vlaar of the Netherlands' Minister for Development Cooperation (DGIS).

"As for subsidies, care must be taken that they are organized in a 'smart' way, which means using existing market channels and partnering with the private sector, instead of replacing private agro-input dealer networks."

Biggest Disaster on Earth

Dr. Jeffrey Sachs, a global advocate and economist on international poverty issues, urged participants to launch, in Africa, a Green Revolution like that of Asia. He said, "there is a hunger crisis in Africa" that is a "disaster, perhaps the biggest on earth." Sachs called for rapid action to get fertilizers and high-yielding seeds to African farmers to stop the hunger crisis and halt destruction of the environment.

Sachs is Director of the Earth Institute at Columbia University, U.S.A; Director of the UN Millennium Project; and Special Advisor to UN Secretary General Kofi Annan.

Sachs advocated providing improved seeds, fertilizer, small-scale water management, and agricultural extension to farming households in Africa through a variety of ways such as vouchers, "smart cards," or local retailers.

"Better inputs will triple or quadruple yields. Over the long term, once the cash crops come along, you can take away the subsidies," he said.

"Food aid is a completely unsustainable, 'bandaid' approach being used as people are dying. Africa can feed itself—if the farmers get the inputs they need. Food aid to Africa costs ten times the cost of fertilizer and improved seeds."

Complex Problems Demand Comprehensive Solutions

Peter McPherson and Rudy Rabbinge, two members of the Summit's Eminent Persons Advisory Group, strongly supported an African-led approach to solving the continent's food and agricultural crisis permanently. McPherson is the founding co-chair of the Partnership to Cut Hunger and Poverty in Africa, former Administrator of the U.S. Agency for International Development (USAID), and current Chair of the IFDC Board. Rabbinge is Chairman of the UN Panel on Food Security and Agricultural Productivity in Africa, a member of the Dutch Parliament, and Deputy Chair of the IFDC Board.

Global fertilizer production is about 147 million tons of nutrients. But less than 200,000 tons are produced annually in sub-Saharan Africa, outside of South Africa, even though some areas have oil and gas—resources that are needed to produce nitrogen fertilizer. Other regions have vast deposits of phosphate rock.

McPherson cautioned against simplistic solutions, such as subsidized fertilizer, to the African food crisis. "Complex problems demand comprehensive solutions," he said. "Africa today is more complex than Asia was in the Sixties and Seventies. The Green Revolution in Asia was mainly with wheat and rice, but in Africa we have a mosaic of crops, climates, and soils."

"It is easier to find Coca-Cola than seed or fertilizer in an African village," wrote Dr. Balu Bumb and Ian Gregory of IFDC in a Summit background paper.

McPherson and Rabbinge agreed that fertilizer subsidies played a role in the Asian Green Revolution, but noted sharp contrasts between Asia of the 1960s and 1970s and Africa today, including:

–Asia had an extensive transport network that connected agricultural lands to markets, whereas Africa has the world's lowest road density.

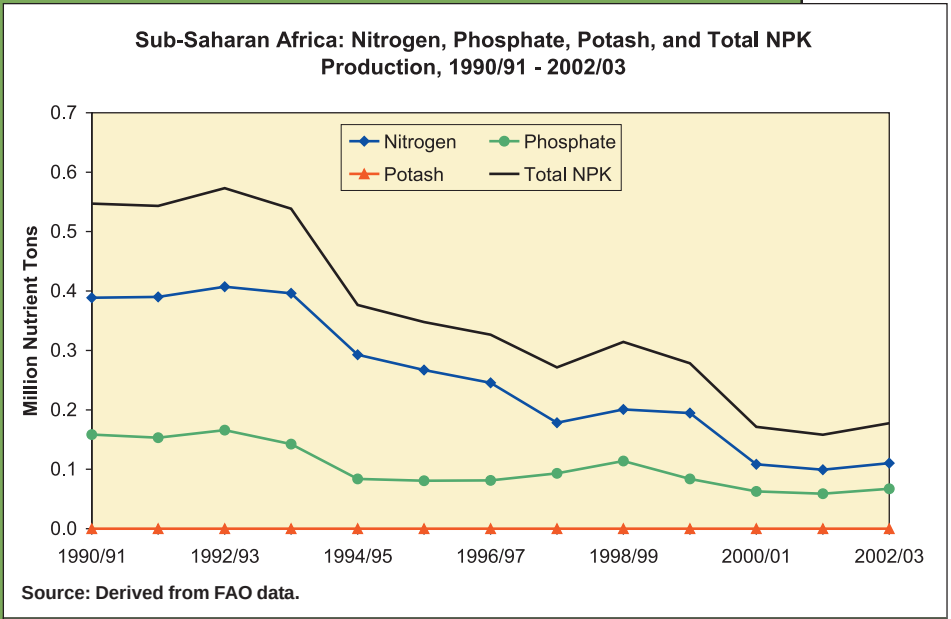


Figure 5. Fertilizer production in sub-Saharan Africa peaked at about 573,000 tons in 1992/93. That was only enough fertilizer to meet a fraction of the region's needs. But production today is only a third that of a decade ago.

–India and Pakistan had a significant pool of scientists and engineers that could develop and deploy new technologies, but investments in education have been too few in Africa.

–The Asian Green Revolution was triggered mainly by improved varieties of rice and wheat. African farmers grow a wide range of crops.

McPherson said that, given finite development resources, "Unlimited fertilizer subsidies without substantial resources for the basics of infrastructure, technology, and training will leave Africa just one season away from the next food crisis."

Fertilizer Production in Africa

Ironically, little fertilizer is manufactured in Africa, even though both the desperate need and many of the natural resources are there (Figures 5 and 6).

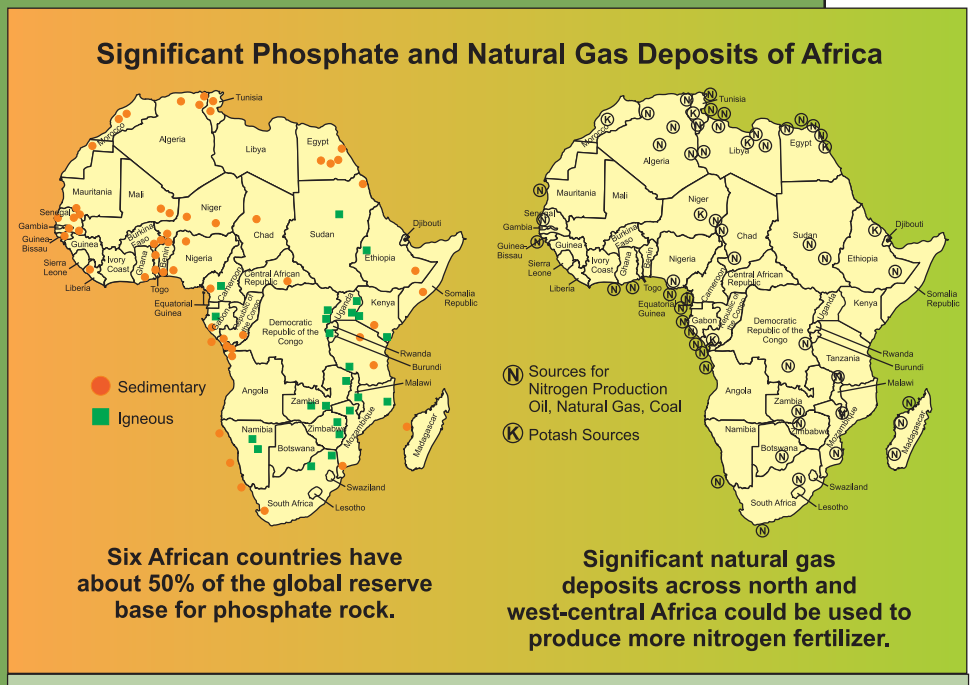
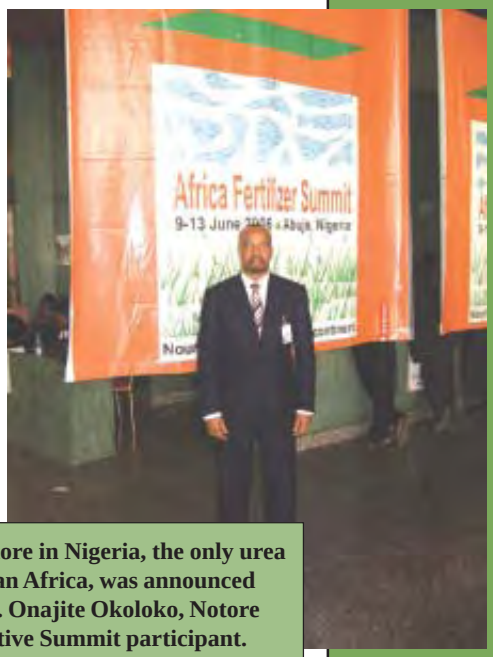


Figure 6. The need for fertilizer is desperate in sub-Saharan Africa, and many of the necessary natural resources for local manufacture are there.

Global fertilizer production is about 155 million tons of nutrients, according to 2003/04 data from the International Fertilizer Industry Association (IFA). Only about 5.9 million tons are produced in Africa; North Africa accounts for about 5.1 million tons of that production and South Africa, 0.7 million tons. Less than 170,000 tons of fertilizer are produced in the remainder of sub-Saharan Africa. That is only 2.9% of Africa's production and 0.1% of global production.

Fertilizer production in sub-Saharan Africa peaked in 1992/93 at about 573,000 tons, wrote D. I. Gregory, IFDC Market Development Specialist, and Dr. B. L. Bumb, IFDC Economist, in a Summit background paper on "Factors Affecting Supply of Fertilizer in Sub-Saharan Africa."

"The steady decline in production since then has been due to the closure of the National Fertilizer Company of Nigeria, Ltd. (NAFCON) ammonia/urea plant in Nigeria in 1996 and the declining production in Tanzania, Zambia, and Zimbabwe," Gregory and Bumb wrote. Figure 5 illustrates the decline in production. The side bar tells of the reopening of NAFCON as Notore.



The opening of Notore in Nigeria, the only urea plant in sub-Saharan Africa, was announced during the Summit. Onajite Okoloko, Notore Director, was an active Summit participant.

Nigeria: The Only Urea Plant in Sub-Saharan Africa Reopens as *Notore* (Genesis)

Notore Chemical Industries announced at the Summit that it will reopen the only urea plant in sub-Saharan Africa, outside of South Africa. Notore is renovating the huge, but defunct, National Fertilizer Company of Nigeria, or NAFCON, in the Niger Delta town of Onne, on Nigeria's southern coast. Notore will manufacture both urea, the world's most common form of nitrogen fertilizer, and anhydrous ammonia, another form of nitrogen fertilizer.

"The Delta has an abundant supply of natural gas, but about 60% is 'flared,' or burned off and wasted," Onajite Okoloko, Notore Director, said. Natural gas, a byproduct of Nigeria's oil drilling industry, is essential for manufacturing nitrogen fertilizer. Onne is also near the Atlantic Ocean, which facilitates the import of raw materials and fertilizer export to other African regions.

Notore began with the 2005 purchase, for $152 million, of the government-owned NAFCON plant. NAFCON was one of the world's largest urea plants when it was built in 1988, but it closed in 1996. Notore means "Genesis" in dialects of the Niger Delta.

In 2004, IFDC participated in a USAID/Nigeria study of how Nigeria could better meet its need for nitrogen fertilizer.

"We considered three possibilities: restarting the NAFCON facility, building a new plant, or relocating a used plant to Nigeria," said Jorge Polo, IFDC Senior Technical Specialist, who was on the study mission. "We concluded that the most efficient way to re-establish urea production in Nigeria was to privatize, rehabilitate, and restart NAFCON, and then consider building new units to meet future needs."

Notore's acquisition of NAFCON resulted from Nigerian President Olusegun Obasanjo's initiative to privatize government-owned businesses and focus on developing the nation's agricultural sector, Okoloko said. More than 40% of Nigeria's gross domestic product is from agriculture.

Okoloko said, "We'll spend $100 million on the plant's refurbishment." The cost of building a new plant with somewhat higher capacity would be about $600 million.

Notore has entered into a 20-year contract with the Nigerian National Petroleum Corporation to supply natural gas to run the new plant.

Notore is owned by a consortium of Nigerian private investors and both local and foreign institutional investors.

The Notore plant will initially produce about 1,700 tons of urea per day or about 600,000 tons per year, Okoloko said. Within 5 years Notore plans to build two more plants and produce about 6,500 tons of urea daily, or 2.4 million tons per year.

Africa Fertilizer Summit Sponsors

Summit sponsors included: the Federal Republic of Nigeria, The Rockefeller Foundation, the African Development Bank (AfDB), Agriterra, the Arab Fertilizer Association (AFA), the Commonwealth Secretariat, the Department for International Development (DFID, UK), the Economic Commission for Africa (ECA), Fidelity Bank (Nigeria), the Food and Agriculture Organization of the United Nations (FAO), the William and Flora Hewlett Foundation, the International Fertilizer Industry Association (IFA), the International Fund for Agricultural Development (IFAD), the Notore Chemical Industries (Nigeria), the Partnership to Cut Hunger and Poverty in Africa, Sasakawa-Global 2000, Shell Canada Limited, the United Bank for Africa PLC, the U.S. Agency for International Development (USAID), and The World Bank. It was implemented by IFDC, an International Center for Soil Fertility and Agricultural Development, in collaboration with NEPAD.

Potential for Local Production of Phosphate Fertilizer

Most African soils are severely deficient in phosphorus, which is essential for energy metabolism in plants.

Six African countries control about 41.5% of the world's currently exploitable phosphate rock reserves and 50.2% of the total global phosphate rock reserve base that may be exploitable in the future (Figure 6), reported Steven J. Van Kauwenbergh, IFDC Senior Geologist, in *Fertilizer Raw Material Resources of Africa*. A draft of the new book was distributed at the Summit as background material.

Ironically, millions of tons of phosphate rock are shipped abroad to be further processed into phosphate fertilizer.

"Development of indigenous fertilizer raw material resources and local or regional fertilizer production facilities are alternatives to supply the nutrients that African farmers must have to feed growing populations," Van Kauwenbergh wrote.

But investors must decide if it's more economical to manufacture fertilizer locally, or to import it.

"It would be too expensive for some countries to produce their own fertilizer," said Dr. Kofi Debrah, IFDC Chief of Party for Market Information Systems and Traders' Organizations in West Africa (MISTOWA). The MISTOWA program puts new information tools, along with training in their use, into the hands of farmers and traders.

"We're trying to get governments to revise policies on imports, because if we import cereals into a country and sell it cheaper than production from domestic resources, farmers will not have the incentive to produce more…and will not be willing to invest in the fertility of the soil," said Debrah.

The Challenge Ahead

"Our challenge now is to work together to maintain the momentum set at Abuja, and revitalize African agriculture," Dr. Amit Roy said after the Summit.

To help reach that goal, IFDC will publish a Summit proceedings in both print and electronic form. IFDC has posted key Summit background papers and PowerPoint presentations, as PDF documents, on the Summit website (www.africafertilizersummit.org).

Work was long, intense, and hectic. Eating a sandwich with one hand—while typing with the other—is Manon Dohmen, Economist/ Association Specialist, IFDC Africa Division, IFDC/Togo. On the far left is Jeff Haskins of Burness Communications, U.S.A. On the right is Andre Oliver, Rockefeller Foundation.

Preparing for the Summit are (left to right) Evelyn Okwudolor, Secretary, Africa Fertilizer Summit; Dan Waterman, IFDC Director of Training and Workshop Coordination; Dr. Amit Roy, IFDC President; and Manon Dohmen.

Behind the Scenes

Preparing conference bags is Richard Kachikwu of IFDC/Nigeria.

Some of the Summit organizers even carried laptop computers to dinner.

Participants were entertained with traditional African danccs at Gala Night.

Working into the night, preparing for the Summit opening.

…and further into the night, collating papers for distribution.

at the Summit

Overview of IFDC booth.

Running the IFDC exhibit is Regine ("Gigi") Dupuy, Communication Officer for MISTOWA, based in Ghana.

Africa Fertilizer Summit

African Union Special Summit
of the Heads of State and Government

Abuja, Nigeria, 13 June 2006

Abuja Declaration on Fertilizer for an African Green Revolution

The New Partnership for Africa's Development has declared that the vision of economic development in Africa must be based on raising and sustaining higher rates of economic growth (7 percent per year). To realize this vision, the African Heads of State and Government adopted the Comprehensive Africa Agricultural Development Programme, which calls for a 6% annual growth in agricultural production, as a framework for the restoration of agricultural growth, food security and rural development in Africa.

Africa's farmers face a variety of constraints including low productivity, limited access to new agricultural technologies and weak markets. Without adequate inputs, farmers often cannot meet the food needs of their own families, much less those of a rapidly growing population. To feed themselves and their countries, farmers will need to shift from low-yielding, extensive land practices to more intensive, higher-yielding practices, with increased use of improved seeds, fertilizers and irrigation.

A move toward reducing hunger on the continent must begin by addressing its severely depleted soils. Due to decades of soil nutrient mining, Africa's soils have become the poorest in the world. It is estimated that the continent loses the equivalent of over $4 billion worth of soil nutrients per year, severely eroding its ability to feed itself. Yet farmers have neither access to nor can they afford the fertilizers needed to add life to their soils. And no region of the world has been able to expand agricultural growth rates, and thus tackle hunger, without increasing fertilizer use.

In Africa, use of fertilizer averages only eight kilograms per hectare. In short, Africa is trapped in a fertilizer crisis; this is only 10% of the world average. Addressing Africa's fertilizer crisis therefore requires urgent and bold actions. Africa is ready for the Green Revolution. Today, African leaders have convened to show their strong and unanimous commitment to achieving the African Green Revolution by taking immediate actions to solve Africa's fertilizer crisis.

The African Union Ministers of Agriculture convened in Abuja on 12 June 2006 for the Africa Fertilizer Summit:

Recognizing that Africa needs a Green Revolution which is long overdue and yet constitutes the way of getting African farmers out of the poverty trap by achieving food security and other relevant the Millennium Development Goals;

Recognizing that fertilizer is crucial for achieving an African Green Revolution in the face of rapidly rising population and declining soil fertility;

Realizing that most farmers in Africa are poor, have virtually no access to fertilizer and that the poorest of them urgently need special attention;

Recognizing the urgent need for a strategic investment program to increase the availability and use of fertilizer alongside with other inputs to usher in the Green Revolution on the African continent;

Declare fertilizer, from both inorganic and organic sources, a strategic commodity without borders; and

Resolve that the African Union Member States will accelerate the timely access of farmers to fertilizers:

1. Given the strategic importance of fertilizer in achieving the African Green Revolution to end hunger, the African Union Member States resolve to increase the level of use of fertilizer from the current average of 8 kilograms per hectare to an average of at least 50 kilograms per hectare by 2015.
2. By mid-2007, the African Union Member States and the Regional Economic Communities should take appropriate 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.
3. By mid-2007, the African Governments must take concrete measures to improve farmers' access to fertilizers, by developing and scaling up input dealers' and community-based networks across rural areas. The Private Sector and Development Partners are hereby requested to support such actions.
4. By 2007, the African Union Member States must take concrete measures to specially address the fertilizer needs of farmers, especially women, and to develop and strengthen the capacity of youth, farmers' associations, civil society organizations, and the private sector.
5. With immediate effect, the African Union Member States must improve farmers' access to fertilizer, by granting, with the support of Africa's Development Partners, targeted subsidies in favor of the fertilizer sector, with special attention to poor farmers.
6. The African Union Member States should take immediate steps to accelerate investment in infrastructure, particularly transport, fiscal incentives, strengthening farmers' organizations, and other measures to improve output market incentives.
7. The African Union Member States should establish national financing facilities for input suppliers to accelerate access to credit at the local and national levels, with specific attention to women.
8. The African Union Member States, hereby request the establishment of Regional Fertilizer Procurement and Distribution Facilities with the support of the African Development Bank, the Economic Commission for Africa, the Regional Economic Communities, and the Regional Development Banks, through strategic public-private partnerships by the end of 2007.
9. Given the extensive fertilizer raw material resources in Africa and the fact that they are underutilized in many parts of the continent, the African Union Member States undertake to promote national/regional fertilizer production and intra-regional fertilizer trade to capture a bigger market and take advantage of economies of scale through appropriate measures such as tax incentives and infrastructure development. This should be supported by the African Development Bank, the Economic Commission for Africa, the Regional Development Banks, the Regional Economic Communities, other Development Partners, and the Private Sector.
10. The African Union Member States should take specific action to improve farmer access to quality seeds, irrigation facilities, extension services, market information, and soil nutrient testing and mapping to facilitate effective and efficient use of inorganic and organic fertilizers, while paying attention to the environment.
11. The African Development Bank, with the support of the Economic Commission for Africa and the African Union Commission, is called to establish, by 2007, an Africa Fertilizer Development Financing Mechanism that will meet the financing requirements of the various actions agreed upon by the Summit. We, the African Union Member States, undertake to support the establishment of this facility and will pledge resources for its immediate operation.
12. The African Union Member States request the African Union Commission and the New Partnership for Africa's Development to set up a mechanism to monitor and evaluate the implementation of this resolution. This should be done in collaboration with the Economic Commission for Africa and the African Development Bank. The African Union Commission should give progress report to the African Heads of State at every sixth-monthly African Union Summit, starting in January 2007.

Project Highlights of 2005/06

Soil Nutrient Mining in Africa: Implications for Resource Conservation and Policy Development

Poverty is forcing farmers in sub-Saharan Africa to "mine" plant nutrients from their soils. About 95 million of Africa's 220 million ha of farmland are losing at least 30 kg of nutrients per hectare yearly—food for the plants that is not replaced.

Farmers have traditionally cleared land, grown a few crops, and then moved on to clear more land, leaving the land fallow to regain its fertility. But a 3% annual growth in population now forces farmers to grow crop after crop on the same land, mining the soil while giving no nutrients back, and to bring marginal land into production.

Contributing to soil mining are poor inherent soil fertility and low use of inputs such as improved seeds and mineral fertilizers," says Dr. Julio Henao, IFDC Senior Scientist, Biometrics. Mineral fertilizer use in Africa is less than 10 kg of NPK per hectare yearly.

"Nutrient depletion rates are greater than 60 kg of nitrogen, phosphorus, and potassium, or NPK, per hectare on about 45% of Africa's farmland, and more than 70 kg on about 18%," Henao says.

Henao explains nutrient requirements: "To produce 1 ton of wheat on 1 ha, the plants need from 15 to 20 kg of N, 3 to 5 kg of P, 4 to 6 kg of K, and less than 1 kg of other minerals. Thus, to produce a ton of wheat, the soil should make available at least 20 to 30 kg of NPK per hectare.

"Nutrient depletion is highest in the sub-humid and humid areas of Central and East Africa. We have found sites with nutrient depletion rates of more than 100 kg of NPK in Rwanda, Burundi, Somalia, Malawi, and Angola." Nutrient mining has particularly increased in cereals such as rice and maize, and in tuber crops such as potatoes, cassava, and yams.

Soils in these areas are shallow and highly weathered, and cultivation of food crops is intensive. Only 0 to 6 kg of NPK per hectare is applied yearly.

Rates of nutrient mining have decreased by 5% to 10% from those observed during 1993–95 in some key cereal crops such as maize, millet, sorghum, and rice in West African countries such as Burkina Faso, Senegal, Benin, Ghana, and the semiarid areas of Mali.

Most depletion of N and P is through soil erosion by wind and water. N and some K are also lost through leaching.

"All soils sooner or later become exhausted if nutrients that are removed or lost are not replaced," Henao says.

"If erosion continues unabated, African crop production will decrease by 17% to 30% by 2020," Henao says. "Cereal production would decrease by about 10 million tons, roots and tubers by 15 million tons, and pulses, 1 million tons."

Sub-Saharan Africa (excluding South Africa) imported almost 20 million tons of cereals, at a cost of $4.4 billion, in 1994, according to FAO. By 2020 the region is projected to buy more than 34 million tons yearly, paying $8.5 billion.

"That's a staggering sum for the poorest region on earth, where almost half the population—300 million of 750 million people—survives, somehow, on about 65 cents a day," Henao says.

The number of malnourished Africans has grown from about 88 million in 1970 to more than 200 million during 1999–2001. If the current trend continues, 340 million people will live in abject poverty by 2015.

Africa's minimal production increases have been achieved by bringing less fertile soils on marginal land into production.

"That's another threat to Africa's endangered wildlife," Henao says.

"Soil nutrient mining is also disrupting the social order—it forces the youth to flock to the congested cities."

Nutrient depletion is low—from 0 kg to 30 kg of NPK per hectare—in most North African countries, and parts of South Africa.

Agriculture in the coastal areas of Libya, Egypt, Tunisia, and Algeria is characterized by high use of mineral fertilizers and appropriate crop management. Cereal productivity in Egypt, for example, is among the world's highest.

Soil depletion data that IFDC gathers are used to identify policies and investment strategies to restore soil fertility and increase land productivity.

Long-term management practices to restore soil fertility include cultivation practices that control soil erosion, recycling of crop residues and farmyard manure, and improved livestock management. Policy strategies include making both organic and mineral fertilizers more readily available, and at a lower cost.

Tools for nutrient monitoring include geographic information systems (GIS), simulation models, and weather forecasting.

IFDC in Africa: Linking Farmers and Markets

Technologies have been developed that can increase productivity dramatically—but farmers haven't adopted them widely because they haven't had access to inputs such as improved seeds, fertilizer, and crop protection products (CPPs).

"That's why the emphasis of IFDC work in Africa has shifted from primarily production research to a stronger focus on the development of input markets," says Robert Groot, Director, Africa Division.

Robert Groot of the IFDC Africa Division in a field in Togo.

"Traditionally, input dealers have sold their products like they were selling fish or canned tomatoes—and often, they *were* selling fish and tomatoes in the same shop," Groot says. "The farmer's choice of fertilizer was simple: 'black' fertilizer, which is mostly NPK or ammonium phosphate, or 'white' fertilizer, which is urea. Purchasing inputs was a gamble, because neither the dealer nor the farmer knew much about the product, or its quality."

Ghana has about 1,000 dealers. About half are "stationary," working from stores and shops. The others are mobile, traveling by motorbike or bicycle, peddling small quantities of inputs in remote villages.

IFDC has trained almost all of the stationary dealers in Ghana in 4- to 5-day courses that cover product knowledge (knowing what they sell), product safety, shop management and bookkeeping, and some basic crop management so they can advise farmers on how to use their products properly.

Input Dealer Training in Ghana

About 85 agricultural input dealers from the private sector were trained in 2003 through the Ghana Agricultural Input Market Strengthening (GAIMS) program, funded by USAID.

Another 400 dealers and extension agents were trained in 2004.

Upon completion of training, dealers receive a diploma and both a T-shirt and a certificate stating, "**We sell quality products**" to display in their shops.

"This is the dealer's pledge to farmers that they will be ethical," Groot says.

"The training resulted in the establishment of 390 new input dealerships in rural areas and increased service to 1,260 subdealers," Groot says. "That gave better access to inputs, and lower transaction costs, for at least 260,000 farmers."

Dealers also opened 1,260 satellite shops in remote areas.

Fertilizer imports almost doubled, from 31,000 tons in 2002 to 61,000 tons in 2004. The trained dealers increased sales of agricultural inputs by 84%.

In 2004, farmers served by the trained dealers increased input purchases for maize by 11%, and

The Ghana Agricultural Input Dealers' Association and a Ghanaian Dealer

Within months after graduating, the 85 dealers trained through GAIMS in 2004 had formed the Ghana Agricultural Input Dealers' Association (GAIDA). Graduates from 2004 soon joined, and GAIDA now numbers 600. GAIDA is now pushing for legislation to ensure quality control and "truth-in-labeling" for agricultural inputs.

"I learned to keep proper records through the training," says Doris Delali Doe, co-owner of Agric Shop, an input shop in the teeming New Plantation area of Accra. "I also learned more about the chemicals themselves. Passing that information on to farmers helps my business." When asked about current needs, Doe replied, "More credit, with better terms."

Doris Delali Doe, an agri-input dealer in Accra, Ghana, proudly shows a farmer her certificate of completion of the GAIMS program.

maize production by 176%, according to a survey by Ghana's Ministry of Agriculture. Input purchases for rice rose by 15%, with a production increase of 155%; and increased inputs for cowpeas rose 26%, with a 69% increased output.

Almost 90% of the farmers interviewed said they now have better access to inputs.

"The budget for the GAIMS program was only $885,000," Groot says. "But look at the payoff!"

"Perhaps the most important payoff of the training was to build confidence and trust between the dealers and the farmers," Groot says. "After the training, the dealers knew what they were selling, and could advise farmers in its use."

Legislation and Standardization Are Needed

Another problem of the input markets in Africa is the absence of legislation. In some countries, there is no legislation at all.

"A dealer in some countries can sell a bag of sand as fertilizer," Groot says. "We are assisting governments of Ghana, Mali, Nigeria, and Burkina Faso to develop regional laws on fertilizer use. For example, urea must be 46% nitrogen—but it's often diluted. The farmer should get the quality he pays for. The nutrient content should be labeled on each bag of fertilizer. The same is true for seeds and crop protection products."

A lack of standardized terminologies, measurements, and language also hampers regional trade.

When seeds of a maize variety are sold by different names in different countries, for example, dealers don't know what they're selling, according to Groot.

IFDC is helping develop regional seed legislation, including a seed catalog to standardize names of varieties across West Africa.

Having contents and instructions only in English or French further complicates interregional trade. Product descriptions should be in both languages.

Farmer Linkages to Markets

"Unless markets are available, farmers have no incentive to increase productivity," Groot says. "No farmer will invest in better seeds or fertilizer if there's a risk he can't sell his/her product."

Over the past 6 years, IFDC has worked with more than 100,000 farmers to link with markets in 16 "pilot" villages in 7 West African countries. Average crop yields have doubled, and family incomes have increased 30% to 50% in those villages.

"That proves that improved technology can work, when both inputs and markets are available," Groot says.

The markets are often there, but farmers have problems accessing them.

"We're helping link maize farmers in southern Togo to the city markets of Lomé," Groot says.

"We're also helping farmers around Lomé grow basil to sell to a French spice company that supplies the U.S. and European markets," Groot says. "That's linking small African farmers to a global market. Accelerating agricultural development involves more than just helping farmers," Groot says. "It requires a consistent approach that targets the entire agricultural sector. That means improvement of farmers' technical skills, and access to improved seeds, credit, fertilizer, and other agricultural inputs. Policies and laws should encourage trade. Last, trade will really take off only if market information is available throughout the agricultural sector. IFDC works in each of these areas."

"A farmer in northern Ghana can grow and sell a limited amount of maize or sorghum in the local markets—but he'll have a hard time linking to Guinness!" Groot explains.

Improving the Fertilizer Link in the Agriculture Value Chain

The harvests of Ames Gounhossou, a maize farmer in Togo, increased by eight times when she began mixing NPK, urea, and organic matter after a cover crop of mucuna. Gounhossou was previously unable to save her produce, but her farmer group now maintains a storage facility that holds 10 tons of grain. Stored grain serves as collateral for microcredit, because a bag of maize that brings $7.50 at harvest can be sold later for about $26.

"There are problems in moving from subsistence farming to commercial farming with higher production and added value," says Robert Groot, Director of IFDC's Africa Division. Inputs like fertilizer are expensive and often not available at the right moment, while farm product prices at harvest are often low.

IFDC has learned that combining the following five interlinked elements in a market-oriented program can improve farmers' livelihoods:

- **Demonstrate that fertilizer use is profitable.**
- **Develop the ability of fertilizer dealers to increase business and services.**
- **Strengthen commodity chains through linking farmers to input and product markets, thus adding value to agricultural products.**
- **Improve access to market information.**
- **Strengthen national and regional policies to encourage trade and investment.**

IFDC has obtained funding from a variety of donors, including IFA, to promote integrated soil fertility management (ISFM) to improve both the efficiency and profitability of fertilizer use. As a result of pilot efforts in 16 regions of West Africa, more than 100,000 farm families in 2005 were using ISFM techniques that enhance soil fertility, fertilizer use efficiency, productivity, and income. The Dutch government recently agreed to provide funding to scale up to reach a million farm families, numbering about 10 million people.

Soil and Nutrient Dynamics Program

The Soil and Nutrient Dynamics Program (SNDP) develops and promotes technologies, information, decision support tools, and management practices that improve the efficiencies of cropping systems and soil and water resources.

"Such innovations must be profitable, improve farmers' lives, and be sustainable, both ecologically and economically," says Dr. Thomas W. Crawford, Jr., Director, IFDC Research and Market Development Division. "We focus on technologies that enhance the efficiency and profitability of crop nutrient use and nutrient recycling, and that improve soil fertility. SNDP also supports market development and policy activities associated with fertilizer efficiency. SNDP scientists also do research with innovative fertilizers to determine the agronomic effectiveness of these new materials."

SNDP research previously focused on eight core activities, Crawford says, but now refocuses on five key activities.

Activity 1. *Improving Efficiency of Water and Plant Nutrient Management*

"The integrated management of mineral and organic fertilizers and water has helped save millions of hectares of marginal lands and wildlife reserves by making their cultivation unnecessary," says Dr. Upendra Singh, Senior Scientist, Systems Modeling (Soil Fertility).

SNDP seeks to improve the efficiency of nutrient and water use, and of

cropping systems, through innovative modifications of fertilizer products and testing of efficient plant types. Examples of this are slow- and controlled-release fertilizers, integration of inorganic and organic sources of essential plant nutrients, and plant types with improved uptake efficiencies for use and uptake of water and other essential plant nutrients.

"Development is strongly emphasized," Singh says. "Technologies developed in laboratories and greenhouses go to the field to remove bottlenecks and for further development, like the manufacture of urea supergranules and NPK briquettes at the village level to promote deep placement technology where it is needed**.**"

Activity 2. *Understanding the Behavior and Roles of Mineral Nutrients in Food Chains, Nutrition, and Health*

Technologies that affect nutritional quality, especially in cereals such as rice, wheat, maize, and sorghum, have huge impacts on the livelihoods and health of farmers and consumers. Nutrient deficiencies are becoming more common with higher yields, intensified cropping, low fertilizer use, and imbalanced fertilization.

"Micronutrient intake has not kept pace with increased food production in much of the world," Singh says. "Consumption of micronutrients is inadequate for more than a third of the earth's people. Micronutrient deficiencies, particularly of zinc and iron, impair growth, intellectual development, physical activity, and survival, especially among women and children in developing countries."

The SNDP research focus is to enrich micronutrients in staple crops that feed the developing world. The research is in partnership with CGIAR centers and private institutions that develop crops with high nutrient densities. One example is adding to the nutritional benefits attained from plant breeding advances in high grain nutrient content with efficient fertilizer management (types of fertilizer, timing, and placement). Such efforts will ensure long-term sustainability both in terms of human nutrition and soil fertility improvement.

Other research focuses on cropping systems that include alternative crops with high nutrient value. An example of this is adding mineral- and vitamin-rich vegetables and legumes to the existing cropping systems to ensure nutritional food, diversity, and to avoid the buildup of pests and diseases.

Activity 3. *Understanding Environmental Aspects of Plant Nutrient Management and Developing Management Techniques to Conserve Soils and to Remediate Degraded or Contaminated Soils and Water*

"Low levels of fertilizer use, particularly in sub-Saharan Africa, contribute to soil degradation and the cropping of marginal lands," Singh says. Both marginal and fertile agro-ecosystems are being degraded through nutrient depletion, soil acidification, soil and wind erosion, soil compaction and degradation, disappearance of perennial grasses and crops, deforestation, loss of biodiversity, reduction of soil water retention, and declining water sources. Combating soil nutrient depletion is essential to achieve sustainable increases in crop production.

Agriculture also causes emission of great volumes of gaseous materials into the atmosphere. Some of the gases—especially carbon dioxide, nitrous oxide, methane, and chlorofluorocarbons—absorb the earth's radiation and contribute to global warming. Global climate change, including higher temperatures and increased carbon dioxide levels, tends to result in increased agricultural production at higher latitudes and lower production in the tropics. The high variability in rainfall, both in quantity and distribution, and higher temperatures, may have a negative impact on the nutrient cycle in the tropics through increased leaching and denitrification, poor efficiency of fertilizer use, and more pests and diseases.

Agriculture is negatively affected by both the underutilization and overuse of water and nutrients. Integrated and balanced fertilization will result in a win-win situation with intensive and sustainable agriculture that feeds the world without harming the environment. The research focus is on integrated nutrient management, fertilizer products and amendments, indigenous resources, crop species, and cropping systems that remediate or improve infertile and contaminated soils. Research on contaminated soils and water focuses on agronomic practices to minimize heavy metal contamination of the food chain, control nitrate pollution in ground water, and limit eutrophication from surface runoff of P by modifying management practices and products (e.g., deep placement of urea-diammonium phosphate [DAP] briquettes).

Activity 4. *Development and Application of Decision Support Systems to Manage Agricultural Development*

Decision-making for agricultural production is becoming more complex because of increased competition caused by globalization and the need to adopt more sustainable management practices. Policymakers, managers, and producers need user-friendly and effective tools to most effectively assess the biophysical and socioeconomic appropriateness and viability of management interventions on agricultural production, soil fertility, and environmental changes. Activities under Decision Support Systems (DSS) include the development, testing, and implementation of methodologies and tools to support decisions in managing agricultural production based on biophysical and socioeconomic data. DSS applications are targeted to reduce soil nutrient depletion, improve soil and water use efficiency, and quantify and reduce risks. The DSS component has linkages with other SNDP activities as well as with the Fertilizer Materials and Policy, Trade and Markets programs, and the Africa Division (Figure 1).

DSS research focuses on the development of best management practices that are site-specific and dynamic. “Fertilizer recommendations developed 50 years ago are still being used in many countries, despite changes in varieties and soil

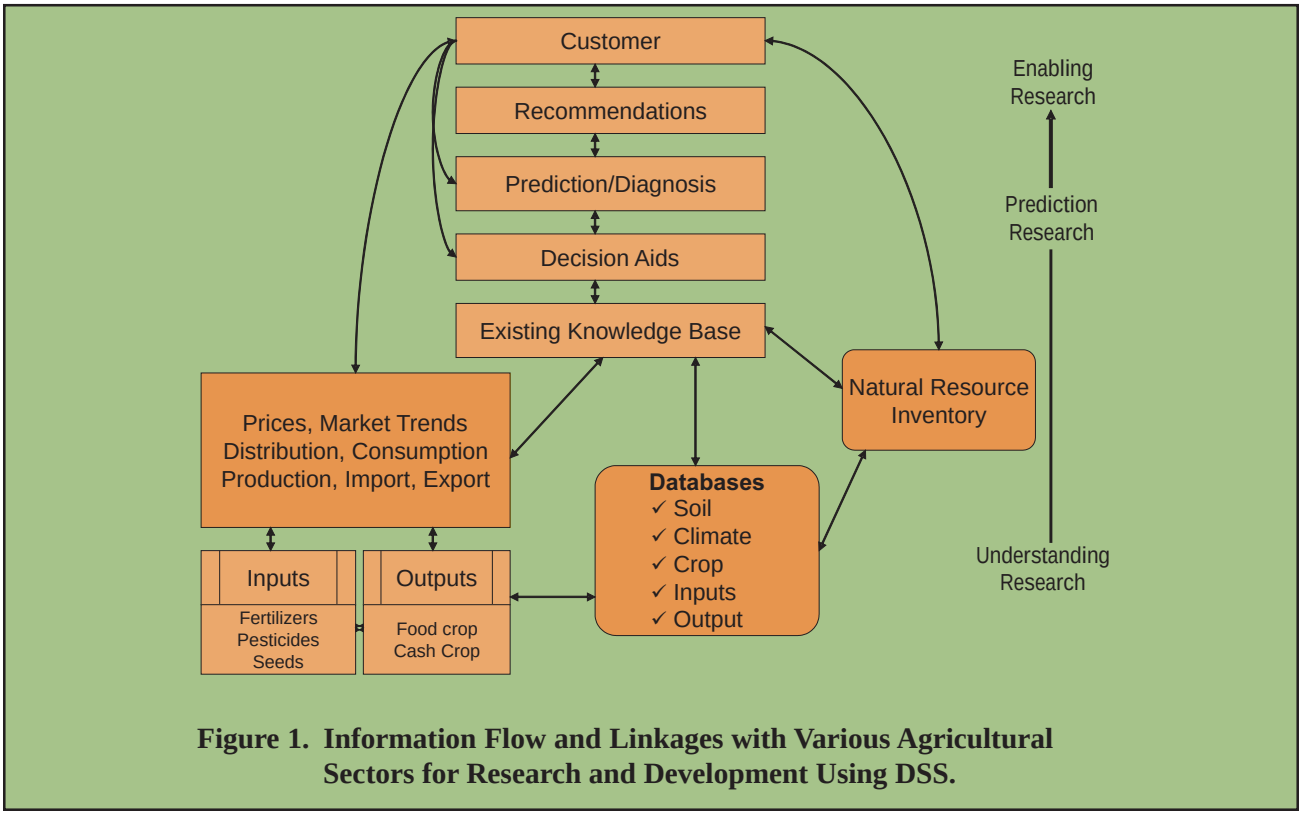


Figure 1. Information Flow and Linkages with Various Agricultural Sectors for Research and Development Using DSS.

fertility," Singh points out. The potential of improved varieties and genetically modified crops cannot be realized unless recommendations are revised continually. An important future DSS activity is to evaluate potential changes in response to global climate change and seasonal weather fluctuations such as through El Niño. The increased linkages between market information systems (MIS) and DSS (Figure 1) will help national economies by predicting the impacts of changing agricultural production. For example, the flexibility and gains associated with switching from one crop to another can be shown for different regions of a country.

Activity 5. *Understanding and Predicting Global Aspects of Plant Nutrients and Fertilizers*

The use of essential plant nutrients as fertilizers is derived from the demand for food commodities. Changes in crop production also affect the global flow of plant nutrients. Research is being conducted by IFDC to analyze nutrient balance at local, regional, and international levels. The influence of soil nutrient trends at the local level is evaluated in terms of global trade and virtual flow of plant nutrients (nutrients moving with food, feed, fiber, and fuel sources). This research aims to demonstrate the effects of key factors and policies on the virtual global flow of nutrients; the production, demand, trade, and use of fertilizers; nutrient recycling; and the environment. Through modeling it will be possible to understand relationships among nutrient use, the productivity and conservation of land and water, and the energy sector.

Integrated Soil Fertility Management

Smallholder Farmers on Marginal Land Contribute to Fertilizer Access

Nutrient depletion threatens the sustainability of land use in most of Africa. Limited access to credit and high fertilizer costs with low efficiency of use are worsening the problem. The cumulative effect is an unfavorable cost:benefit ratio for fertilizer use.

"Integrated soil fertility management, or ISFM, is a tool to improve the efficiency—and thus, the profitability—of fertilizer use for smallholder farmers," says Dr. Henk Breman, IFDC Resident Representative and Principal Scientist based in Belgium. "Lower nutrient losses are an added benefit. That decreases environmental risks."

"ISFM differs from approaches that use locally available soil amendments to limit the use of inorganic fertilizers," Breman explains.

ISFM involves the integrated use of inorganic fertilizer and soil amendments such as organic matter, lime, and phosphate rock. Such soil amendments interact with mineral fertilizers to improve the soil quality, including organic matter status, pH, and available P.

"ISFM, as developed and promoted by IFDC, also differs from simple technology transfer," Breman says. "It's a participatory process, where all stakeholders play a role. The stakeholders must ensure that the right technology is promoted in the right place, with conditions that encourage and enable adoption. This means involvement of not only farmers and farmer organizations, but also nongovernmental organizations (NGOs), extension services, input dealers, rural banks, and credit systems. The main roles of IFDC are scientific backstopping, organizing and facilitating stakeholder platforms, and helping strengthen stakeholder groups."

Overpopulation at Low Population Density

"Much of Africa is overpopulated—even in areas where population density is relatively low," Breman says. There are too many farmers, and thus too much pressure on already-depleted soil, to sustain subsistence farming. "The use of organic fertilizers, with limited or no mineral fertilizers, maintains at best, the status quo of soil quality," Breman explains. "The farmer's economic benefit from low investments in inorganic fertilizer is counter-balanced by low competitiveness of its use. Also, African farmers do not have the

economic benefit of large-scale import or production of fertilizers."

Poor Soils Worse Than Drought in the Sahel

Surprisingly, soil nutrient deficiencies limit crop and animal production even more than drought in the arid Sahel, scientists from the Netherlands found through research in Mali in the 1970s. Fertilizers could alleviate the soil nutrient problem, but their economic use was limited to a few high-value crops such as cotton and sugar cane grown under favorable conditions. Nevertheless, the efficiency and economics of fertilizer use improved when integrated with indigenous production systems, giving smallholders on marginal land a comparative advantage. Meanwhile, IFDC confirmed those findings in dry Niger, showing that crops use rainwater more efficiently when soil fertility is improved through fertilizer use.

IFDC then used results of the Mali research to develop practical systems for smallholder African farmers. A range of ISFM options was developed, with specific but often overlapping recommendation domains. The development, testing, and introduction of technologies was in close partnership with farmers, NGOs, extension services, and the Tropical Soil Biology and Fertility Institute (TSBF) of the International Center for Tropical Agriculture (CIAT), with financial support from IFAD, IFA, USAID, and DGIS.

From 2000 to 2003, IFDC and partners worked with 3,000 farmers in 7 countries, and reached many more through demonstrations, field days, and farmer-to-farmer exchanges. Sources of organic matter included straw, manure, composts, household wastes, leguminous cover crops, perennial grasses, and agroforestry products. Technologies were developed that were effective in the West African Sahel, through the Soudanian and Guinea savannas, to the coastal savannahs of Ghana, Togo, and Benin, and in East Africa. ISFM technologies were effective in diverse crops: millet, sorghum, maize, cowpeas, groundnuts, cotton, irrigated rice, and cassava. The efficiency of fertilizer use increased by 50% over the 4-year period.

"ISFM has particularly strong effects on soils with low organic matter, and in dry years," Breman says. "For example, consider on-farm fertilizer use in millet production on compound fields, directly around the farmhouse, and on bush fields in Karabedji, a Sahelian village in Niger where rainfall averages 500 mm/year. The soil organic matter status on compound fields is maintained by applying manure and household wastes. A typical ISFM technology is to combine these amendments with inorganic fertilizer."

Without fertilizer, millet yields on bush fields ranged from 150 to 180 kg/ha. On compound fields, yields ranged from 490 to 570 kg/ha. Both N and P appeared limiting. Using inorganic fertilizers, N efficiencies were maximum with doses of 30 kg/ha of both N and P. In the first year of the trial, the average yield was 1,220 kg/ha for bush fields, which did not receive manure and household wastes besides the inorganic fertilizers, and 1,940 kg/ha for compound fields that did.

1 kg of N = 25-42 kg of millet

"Every kilogram of nitrogen produced 25 kg of millet grain on the outlying fields, and 42 kg on the compound fields," Breman says.

During the 3-year trial, rainfall decreased from 640 to 470 to 370 mm/year. Despite the decreased rainfall and the extreme dry third year, thanks to ISFM, fertilizer use efficiency and yields increased every year. For the highest N doses (60 kg/ha) on the compound fields, the successive yields were 1.9, 2.7, and 2.9 tons/ha. The average millet yield in Niger is only 0.4 tons/ha.

ISFM Manual

An ISFM Manual that describes ISFM and its technical options is being prepared.

Farmer Education

Soil fertility varies greatly in Africa, both naturally and because of human intervention. That makes programs to improve nutrient availability and soil health difficult.

"Farmers who do not own the land they cultivate are reluctant to invest precious savings to improve soil fertility,"says Dr. Abdoulaye Mando, Program Leader, IFDC Natural Resources Management Program, based in Lomé, Togo.

"Furthermore, payoffs for investments in soil health aren't always immediate, and are sometimes hard to see. Access to resources—not only to land, but also to agri-inputs like fertilizers and credit—often differs, even among family members."

Women can't inherit land from their husbands in many societies, for example. Yet ironically, small agricultural loans are often available only to women.

Farmers evaluate research during the growing season to understand the principles of ISFM technology.

Farmer-Led Research

"An African farmer's life is harsh—and that makes farmer-led research an absolute necessity," Mando says. "We make *farmers themselves* the research leaders, so they 'own' the research results and can help train other farmers."

The IFDC approach in Africa is to develop farmers' analytical skills so they can explore possibilities and solve their own problems.

IFDC trained 3,500 farmers, in 16 pilot sites and 150 learning groups in 2004 and 2005. Farmers learned to:

- Diagnose their farm environments.
- Identify key problems.
- Analyze those problems, along with their causes and possible solutions.
- Learn about major principles of ISFM and how to implement ISFM techniques.
- Study and test the performance of ISFM techniques.

Thirty farmers in southern Togo initiated 22 small "nutrient-omission" plots—omitting the application of N, P, or K, but applying the two other major nutrients—on *terre de barre*, or highly leached soil, during the main rainy seasons in 2003 and 2004. Some fields were planted with mucuna, a nitrogen-fixing legume that is often used as a cover crop, during a fallow in the preceding short rainy season; others were not.

Yields on plots grown after mucuna, but without added N, were 2.5 tons/ha; without P, 2.4 tons/ha; and without K, 1.4 tons/ha. That shows that K is the element most critical for maize yield in the infertile soils of the area. Mucuna also has a strong beneficial effect on the soil's capacity to supply N and P to the plants.

"Unfortunately, potassium alone is seldom available in the market," Mando says. "For a

Tomato Producers in Northern Togo

With the support of IFDC, the Tomato Project was initiated by Research, Support, and Training for the Initiatives of Self Development (RAFIA), an NGO in northern Togo. RAFIA is an active member of Agricultural Intensification in sub-Saharan Africa (AISSA) and began the project with the specific aim of encouraging young farmers to stay in the northern region after the agricultural season. The idea behind the project was quite simple and was based on the relatively abundant availability of lowlands in this region and the recognition that most of the tomatoes consumed in Lomé came from Burkina Faso (i.e., Kompienga, 70 km from Dapaong), Ghana, and Benin. Truckloads of tomatoes passed through the region on their way to Lomé. RAFIA first organized a series of study tours to Burkina Faso and Benin, with representatives from farmer organizations and village groups, to see how farmers were exploiting the lowlands. After these visits, and joint cost-benefit analyses, a specific program was developed to assist farmers with the development of horticultural production. Thirty-five wells have been constructed with financial assistance from Vredeseilanden (VeCO), a Belgium NGO. RAFIA provided technical advice to farmers, from simple measures to harvest and retain water to the digging and maintenance of irrigation canals; advice on agricultural techniques was also provided. Though diagnostic studies indicated a large potential for several other horticultural crops, i.e., onions and cabbage; most farmers have chosen tomatoes as their principal crop.

RAFIA quickly succeeded in diverting some large traders from their usual collection sites in Burkina Faso to the producers in the northern region. Of course the anticipated decrease in transportation costs and avoidance of customs duties was attractive to them. Nevertheless, the farmers generally received very low prices because of a lack of coordination between the farmer groups and insufficient knowledge of prices and market outlets. With assistance from RAFIA, farmer-based committees organized the marketing of the vegetables produced. The role of these committees was to collect information on prices and market outlets, contact traders, and negotiate on behalf of (specific) farmer groups with these traders. Though the negotiation process took place in the town of Dapaong, many farmers felt that they had lost control and they were often also dissatisfied with the final result. Because there were many committees, i.e., one committee for every farmer group, traders could easily play farmer groups against one another. To improve both bargaining power and control in the negotiation process, a new institution was created—the Committee of Horticultural Activities (CAM). Traders now first discuss prices (i.e., bottom and ceiling prices) with the interlocutors of CAM. Results of these negotiations are communicated to all the members before the traders go into the field and make the final deal with the farmer groups (and the local committees who are still there). Today the farmers all seem to be quite satisfied with the interlocutors, although some of them feel that CAM could be more pro-active in identifying alternative marketing channels.

RAFIA and IFDC now focus, together with the farmers and other stakeholders in the region, on capacity building and strategic issues like the improvement of the credit structure, coordination of new initiatives in horticulture, and opportunities to add value to agricultural products. Most importantly, there is a growing recognition within the region that improvement (i.e., competitiveness) is not something that projects bring (and take) with them; it is something to work for together.

farmer to get potassium, he must buy a more expensive formula of N-P-K as 15-15-15.

"Growing these plots allowed farmers to 'see for themselves' the role of N, P or K, and of mucuna, in crop performance, and to rank the nutrients from the most to the least limiting.

"We hope the results will also help input dealers and farmers advocate policy changes that allow farmers access to cheaper potassium."

Fertilizers and Sustainable Agricultural Development and Farmers for the Future Projects

With support from IFA and USAID, IFDC is undertaking two closely linked pilot projects to promote sustainable agricultural intensification by smallholder farmers. The project, under the direction of Dr. Arno Maatman of the Africa Division, is active in 7 West African countries, collaborates with more than 30 public and private facilitating organizations, and has reached out to at least 125,000 smallholder farmers and 500 local entrepreneurs, including farmer cooperatives involved in pooling and distribution of inputs and/or marketing of agricultural products. The project enabled the development of the competitive agricultural systems and enterprises (CASE) approach (see under the Thousands to Millions project), a holistic action-oriented approach that fosters both technological and institutional change, through bottom-up learning processes.

Adequate capacity strengthening, facilitating and networking services have enabled farmers, local entrepreneurs, local business development services, and credit institutions to strengthen the competitive advantages of pilot regions, for specific commodities (e.g., rice, maize, cassava, cowpeas, horticultural crops, and products). These services involve both social and individual learning through training, experimentation (also with alternative institutional arrangements), study visits, networking, and platform-building activities. It also includes occasional support to well-targeted catalytic events such as trade fairs and mass media campaigns. Some results from the two pilot projects include:

1. Adoption of ISFM options is expanding. An estimated total of 125,000 farmers have adopted ISFM technologies on a significant part of their farms. The value:cost ratios of ISFM options adopted are well above 2, and returns to family labor are 2-6 times higher than the average salary in the area. Farm-level incomes of ISFM farmers have increased by 20%-50%.
2. ISFM farmer learning groups established in 300 pilot villages are taking the lead in the development and validation of ISFM options for a focused set of marketable products and experimenting with alternative institutional arrangements to improve access to factor (including information) and product markets.
3. Organizational capacities of farmer groups in the pilot areas improved. Farmer groups at the village and regional levels have assumed new roles, e.g., input provisioning, diffusion of information, linkages to credit and savings systems and local and regional traders, including retailers and fertilizer companies.
4. About 500 local entrepreneurs—inputs dealers, traders, managers of warehouses and processing units, including farmer cooperatives—have received training, participated in round table meetings, and worked with ISFM farmer groups.
5. Gender awareness increased in the pilot villages and within the facilitating institutions. Women play an important role in the ISFM project activities and related decision-making. They are on average equally represented in the ISFM farmer groups and often have leading roles.
6. Land tenure security improved for ISFM farmers, including female farmers. In some cases, contracts between landowners and ISFM farmers were established for a sequence of years.

7. Capacities of facilitating organizations were strengthened. The quality of services provided to farmers and local entrepreneurs has improved considerably.

To improve the exchange of experiences between the various facilitating organizations—involving both public research and extension systems, private business development services, NGOs, farmer and trader organizations, and credit institutions—the Agricultural Intensification in Sub-Saharan Africa (AISSA) network was established. This network is intended to become an important platform to exchange information on agricultural intensification processes, to develop and disseminate facilitation tools, and to stimulate more effective collaboration.

The ISFM projects have been instrumental in developing the CASE approach, which is receiving much attention in West Africa. As a balanced approach, CASE focused on clusters and highly specific commodity value chains but is holistic because it deals with all the major actors involved in cluster and commodity chain development. It is inclusive because it specifically targets small-scale farmers, including young farmers and women, but exclusive as a process, stimulating innovation among farmers and local entrepreneurs. The Syngenta Foundation for Sustainable Agriculture (FSAD) and Farmers for the Future (FfF) projects will be integrated in the 1000s+ project in 2006, and contribute to specific elements in the 1000s+ activities. The IFA-funded FSAD project will concentrate even more on the input distribution aspects, and in particular timely access of farmers to fertilizers of good quality. Training of farmer cooperatives and of input dealers, and establishment of inventory credit systems to strengthen access to credit, and increase efficiency in input delivery will be the key areas of intervention financed through the FSAD project. The FfF project will focus more exclusively on the Niger sites, and further develop the successful ISFM project in the Gaya and Maradi pilot areas. The FfF sites in Niger will constitute a first ensemble of "learning centers," and will have a pivotal role in the dissemination of experiences and lessons across the various 1000s+ pilot regions and clusters in West Africa.

Agricultural Production Program in Mali

The International Program of the Cooperative League of the United States of America (CLUSA) is the prime contractor for a project called PRODEPAM—Program for the Development of Agricultural Production in Mali. IFDC is a member of a consortium led by CLUSA, which manages the project and focuses on farmer organization. Other consortium members and their areas of focus include: Sheladia (irrigation); Land O'Lakes (animal feed); and Approtec (irrigation equipment—pumps). IFDC is responsible for natural resource management (NRM), production technology (irrigated crops), extension (ISFM strategies) and input marketing issues.

The goal of PRODEPAM, which began in 2004, is to increase producer incomes and foster sustainable, environmentally sound economic growth. PRODEPAM is funded by USAID and is one of its primary projects in Mali. The project aims to stimulate agricultural productivity in Mali in two sectors: (1) irrigated crops (rice and horticultural crops) and (2) animal feed. The project covers a large part of Mali: the Mopti, Ségou, Sikasso, Bamako, Tombouctou, and Gao regions.

IFDC has brought in a highly skilled and balanced team to PRODEPAM. With two women on the team, it is gender balanced. The team members have experience in the private sector, in NGOs, and with the CASE approach. The team brings in new perspectives through staff from Benin and Burkina Faso. Activities in 2005/06 have concentrated on (1) the capacity strengthening of farmer organizations in community-based seed production, pooling, and purchasing of seeds and fertilizers; (2) training of NGOs in participatory development of ISFM technologies, in particular for the production of rice, potatoes, and wheat; (3) training of farmer groups and cooperatives (among others women groups producing and marketing horticultural

Providing Management Options to Moroccan Farmers for Improved Production

The purpose of the TAG 656-IFDC program is to help farmers alleviate poverty through increased income, food availability, and reduced risks. This is achieved by improving agricultural planning and decision-making through the development and use of an Information and Decision Support System (IDSS).

The IDSS prototype developed with our collaborators in Morocco uses an applied systems research approach that is based on Crop Simulation Models (CSM) including the Decision Support System for Agrotechnology Transfer (DSSAT) and spatial data handling and display capabilities of GIS.

IDSS links together the soil and weather databases as polygon layers with a simulation model designed to mimic crop growth. The IDSS provides an interactive evaluation simulator with dynamic graphics that allows for assessing the feasibility of land units for cereal production and for exploratory analysis with farmers, extensionists, and policymakers by providing rapid feedback on crop management.

When IDSS application is combined with real time, historical, and forecast weather data, then time-dependent strategic decisions can be made. Such decisions include the determination of: (1) crops/varieties to grow, (2) planting date, (3) row spacing, (4) timing and rate of N application, and (5) crop rotation alternatives. Analysis of alternatives offers opportunities to benefit from rainy seasons and reduces risks and associated economic losses during poor rainfall years to farmers, and planning and tactical resources to policymakers.

The IDSS built for the Settat province in Morocco will help users save time because of its ability to rapidly assess management alternatives, generate maps, and optimize management scenarios. One of the outputs of the IDSS is a characterization of optimal zones for production, given a set of management inputs and economic data (costs of inputs and value of the outputs). The IDSS generates maps that delineate areas of highest productivity and maximum economic return.

The second component to the analysis is an economic evaluation. Since a uniform set of management inputs is used for this simulation, the economic evaluation will largely reflect the yields. The IDSS allows the user to specify costs and prices. The map produced by intersecting the biophysical inputs and outputs to the system with the input price/cost structure generates a map showing potential profit per hectare for the area, given the constraints of the simulation. In some areas it is shown to be unprofitable given this set of management and costs; in this case, production inputs would need to be optimized for those areas to identify sustainable inputs.

The value of the IDSS developed in Morocco is in its portability, site specificity, and flexibility. The same system can be utilized (and improved) at other locations as long as critical inputs such as weather and soil data are available. Yet, the IDSS should not be considered a substitute for farmer knowledge, but rather as an additional tool that offers farmers options to help minimize risk and optimize the profit for the farmer.

products, including onions, potatoes and rice) in farmer-to-farmer extension, formation of cooperatives and marketing of agricultural produce; (4) organization of platforms and consultative meetings between farmers, input-dealers, and credit institutions, to discuss and improve efficiency of seed multiplication and distribution (in particular for potatoes, and rice – e.g., NERICA varieties). IFDC's contribution to PRODEPAM is highly appreciated, as has been firmly expressed in an external review carried out in 2006.

Adopting Nutrient Management Technologies

IFDC is conducting the Adopting Nutrient Management Technologies (ANMAT) project that promotes the adoption of balanced fertilizer use and improved efficiency of fertilization in Bangladesh, Cambodia, and Vietnam. The project works with NGOs and extension services to demonstrate the benefits of deep-placed urea supergranules (USG) and NPK fertilizer granules for rice production. "In addition to increasing incomes of poor farmers, the improved practices are more protective of the environment," says Dr. Walter T. Bowen, Resident Project Coordinator—ANMAT II. The project uses baseline and impact surveys to determine social and economic benefits of urea and fertilizer deep placement (FDP). The IFDC methodology for participatory evaluation and monitoring was characterized as "innovative" by an IFAD review team, because it departed from traditional baseline surveys by collecting data on farmers' "standard of living" and "life wishes." The baseline and impact surveys are designed to follow investment flows and document improvements in standards of living that result from improved rice production and household income.

Results:

- Over 550,000 farmers are practicing urea deep placement (UDP) in Bangladesh.
- Over 1,800 urea briquette-making machines have been sold in Bangladesh since 1999 by 11 different manufacturers.
- On-farm demonstrations managed by farmers showed that the UDP technology increased paddy yields by 900-1,100 kg/ha, decreased urea fertilizer use by 78-150 kg urea per hectare, and subsequently increased profits by US $116-137 per hectare.
- The latest version of the Fertilization Recommendation Guide published in 2005 by the Bangladesh Agricultural Research Council (BARC) contains a section on the deep placement of urea briquettes; the material included in the guide was prepared by IFDC and partners.
- The Department of Agricultural Extension in Bangladesh requested late June 2006 that IFDC assist in the development of a national campaign to promote UDP.
- About 6,700 farmers are now practicing FDP in Vietnam.
- The supply chain for fertilizer briquettes in Vietnam now consists of 4 machine manufacturers, 12 briquette producers, and 59 retailers.
- ANMAT partners in Vietnam participated in a national conference on agricultural technology during October 2005 in Hanoi, and provided a presentation that highlighted FDP. Also, prior to

the meeting, FDP was officially approved for national dissemination by the Vietnam Ministry of Agriculture and Rural Development.

- Only recently introduced to Cambodia, over 200 farmers have purchased urea and fertilizer briquettes for deep placement in rice.
- The ANMAT training programs during 2005 were 1-day farmer training sessions on the deep placement of urea or fertilizer briquettes in wetland rice. During the year, the total number of training sessions and farmers were as follows:
  - Bangladesh: 16 training sessions, 312 farmers, 8 women
  - Cambodia: 12 training sessions, 208 farmers, 34 women
  - Vietnam: 17 training sessions, 536 farmers, 85 women

Fertilizer Production

Training of Technicians, Engineers, and Managers in Fertilizer Production

IFDC's expertise in the design and operation of many fertilizer production units of different technologies has provided the background for transmitting information on these subjects to technicians, operators, engineers, and technical managers around the world dedicated to the design, construction, and operation of fertilizer production facilities. Through the years of activities, IFDC has satisfactorily trained thousands of industry personnel, which in many cases has resulted in improvement of the operation and product quality of fertilizer-producing companies around the world.

In 2005, three major technical training programs were carried out; one was conducted for a private fertilizer production facility in South America, and two were presented for engineers working in fertilizer companies throughout the world.

In the program conducted for a private company in South America, all the production, technical, maintenance, laboratory, and administrative personnel of the company participated at the plant site for 2 weeks. Two engineers from IFDC presented a very complete program that was very well received and complimented by the company's personnel. During the visit to the facility, the IFDC engineers also devoted some time to assessing the operation of the plant and making recommendations for improvements.

The other two programs were workshops carried out for IFA, following on the success of previous workshops. One of the workshops was devoted to nitrogen fertilizers and the other one to phosphate and NPK fertilizers. Both workshops

were held in Europe and were devoted to improving the technical knowledge of engineers involved in fertilizer production. Speakers were brought in from many different engineering companies and production facilities around the world.

Robert Bosheers, Supervisor (right) and David Gooch, technician, taking technical data during research work at the IFDC Pilot Plant.

The IFA Technical Committee provided assistance in the development of the program content of the workshops and made some of the initial contacts for speakers and plant visits. IFDC worked with the speakers, organized the presentations and programs, handled the administrative arrangements, marketed the program, and assisted participants with visas and logistical matters. Three IFDC engineers conducted the two programs, which attracted 26 participants from 14 countries for the nitrogen workshop and 32 participants from 18 countries for the phosphate and NPK workshop. An exam was given to the participants at the start of each of the workshops and then at the end, to provide a measure of the technical knowledge gained. The average knowledge gain increase in the nitrogen workshop was 30% and in the phosphorus and NPK workshop 28%, which shows a great improvement in their understanding of fertilizer production technology.

Market and Management Information Systems

Supporting Agricultural Input Markets in Developing Countries

The development of effective agricultural sectors requires the interlinking of elements to sustain productivity, preserve natural resources, and provide quality food and welfare for growing populations.

"Input and output markets are essential—and reliable agricultural information networks are critical—to increased trade and business and thus, to poverty alleviation and food security," says Dr. Julio Henao, IFDC Senior Scientist, Biometrics.

IFDC activities in Market and Management Information Systems (MMIS) increase the use of regional agricultural information by improving and linking efforts to generate, disseminate, and commercially use input market information. MMIS helps regional input markets and trade associations address both needs and constraints, to build strong and dynamic commodity chains that use the information to enhance input use and to monitor prices, production, and trade.

"Good information enhances value-added services such as processing, packaging, and product quality," Henao explains.

The ultimate objective is to improve information flows among public and private sectors associated with policy making, agricultural production, input markets, and trade.

Associated MMIS activities are to:

- Identify the information, methodologies, and procedures that public and private institutions use to collect and disseminate data. Determine the strengths and weaknesses of those institutions, and their roles in market development.
- Assess key users and beneficiaries of agricultural information.
- Evaluate and improve the process of adding value to input market information, including resources involved and technology used.
- Improve management systems, implement analytical methods, and evaluate reporting systems.
- Identify and describe communication products prepared, and media used for their dissemination. Evaluate strategies for information exchange among institutions that provide information services. Analyze standards, consistency, timeliness, coverage, and reliability of the information.
- Assess network systems and platforms for internet services and web site strategies for data transfer and reporting. Assess GIS and other systems that facilitate and support input markets and trade.

Despite progress, many problems keep agricultural information underutilized and relatively inefficient: stifling agricultural policies, excessive regulations, lack of resources and training, and deficient management services. The result is economic and financial costs; lack of continuity, especially in the public sector; low reliability; lack of stimuli for investment; and inefficient market services.

IFDC has collaborated with the public and private sectors in Albania to design strategies to organize agricultural statistics for market support. Albania subsequently established a system that helps the public sector organize and monitor agricultural statistics and maintain national accounts. This provides data and methodologies to the private sector for establishing MIS. Other

market information activities have been in Eastern Europe, Africa, and Latin America. IFDC has also provided information management support to Afghanistan.

Strengthening Networks of Regional Market Information Systems and Traders' Organizations in West Africa

USAID awarded IFDC the 4-year MISTOWA project in September 2004; this project aims to increase regional agricultural trade and food security through the improvement and linkage of the existing regional efforts to generate, disseminate, and commercially use market information. MISTOWA, under the guidance of Dr. S. Kofi Debrah, Chief of Party, is helping regional MIS and trade partners to address other constraints so that strong and dynamic commodity chains emerge that will use the information to enhance production, handling, credit, trade, and value-added services such as post-harvest processing, packaging, and quality control. Effective MIS and trader organizations will also heighten farmer awareness of opportunities and technologies to increase production and will facilitate the demand-pull for higher value and quality agricultural products.

The MISTOWA project has accomplished the following:

- Organized training, conferences, trade fairs and study tours in which approximately 9,000 participants from West Africa benefited.
- Awarded equipment grants totaling $800,000 to partners in 10 countries for the purchase of computers and internet connectivity and associated training to access market opportunities.
- Awarded $78,000 in competitive grants to five partners in support of trade fair participation.
- Provided more information and opportunities through face-to-face events and training in Information and Communication Technology (ICT) skills, including Internet search and Short Message Service (SMS) inquiries for producers and traders, thus making the market more transparent and efficient. As a consequence, producer and trader associations reported making over $20.847 million trade deals involving a variety of commodities.
- Trained 120 leaders of producer and trader organizations from 10 West African countries in advocacy, which led to the development of a regional advocacy plan to address road harassment, elimination of fake products and private-public sector partnership to generate and disseminate agricultural market information.
- Assisted with Network of West African Market Information Systems (RESIMAO) to develop a common platform <www.resimao.org> to link their database information and databases for regional usage.
- Developed the project trade portal <www.wa-agritrade.net> and trained producers and traders to access market opportunities through the portal, email, cellular phones, broadcast, and print media.

MISTOWA: Making Market Information Available to Stimulate Trade in Africa

Good market information is essential for the development of trade in commodities and inputs among, and within, countries in West Africa.

"Farmers and traders have limited access to information on prices, markets, and supply and demand," says Dr. Kofi Debrah, Chief of Party of the MISTOWA project.

"Yet new information technology—email, the Internet, even text messaging on cellular phones—makes delivery of timely and accurate information far more practical than before.

"Traders and farmers learn to use the new technologies quickly—if they need the information. That's proven by their reports of successful business deals that the technology makes possible."

The MISTOWA project was designed to put new information tools, along with training in their use, into the hands of farmers and traders in West Africa.

"Information is needed to promote agricultural development in West Africa," Debrah says. Intra-regional trade is only about 10% of trade with non-African countries. And within countries, inadequate market information means that farmers often receive only about a third or less of the final consumer price of their products.

One reason that farmers are inadequately compensated for their products is the numerous hidden costs—including middlemen, fees, extortion, bribes, and taxes—a commodity goes through from the field to the consumer (see box on page 48).

"A commodity typically changes hands four or five times, with added costs with each transaction, before reaching the final consumer," Debrah points out.

"The high transaction costs mean that locally produced food is too expensive to compete with imports," Debrah says. "The problem is the same with the fertilizer and other inputs that farmers need to produce that food."

MISTOWA seeks to develop stronger markets by reducing the costs of doing business at each part of the supply chain. In some cases, transactions may be eliminated.

MISTOWA also works to encourage trade among West African countries through collaboration with the 14-country Economic Community of West African States (ECOWAS) and West African Trade Hub.

MISTOWA is also training leaders of farmer and trader associations in advocacy so they can demand changes to enable people, food, and agricultural inputs to cross borders more freely.

"Whenever traders cross a national border, they encounter harassment through extortion and bribes," Debrah explains. "We're making trader and farmer leaders aware of how this problem stifles trade—and how they can pressure decision-makers to implement changes that encourage free movement."

The MISTOWA program is funded for 2004-2008 through the West African Regional Program of USAID.

From Debé, Burkina Faso to Accra, Ghana: 45 days in the life of a sack of onions…

Situation without MISTOWA Intervention	**Situation with MISTOWA Intervention**
- *Product changes hands four or five times before reaching the final consumer resulting in higher cost for consumer.* - *Long time lag of up to 50 days before product reaches final consumer.* - *Large transaction costs and harassments along the trading corridor.* - *Lack of current market prices and weak negotiating power results in producer receiving small share of the final consumer price.* - *High prices for consumers.*	- *Some intermediaries and steps between producer and consumer eliminated.* - *Time lag between production and final consumption reduced.* - *Transaction costs reduced.* - *Producers and traders are knowledgeable of price levels, able to seek transporters and buyers, are aware of his rights at the border and have better negotiating skills.* - *Larger share of the consumer price accruing to producer.* - *Lower prices for consumers.*
• Fatou, a female onion producer of SOCAMAD (Farmers' Cooperative) in Debé, Burkina Faso, wants to sell a 120-kilogram sack of onions. • Fatou waits by the roadside for transport to the "assembly" market at Tougan, 61 km away. There, she will seek a trader to buy her onions who will resell them in a larger market in Ouagadougou, 237 km away. *Fatou sells to Amadou, a local Tougan trader, at $5.60 after a 3-day search.*	• Fatou, a female onion producer of SOCAMAD (Farmers' Cooperative) in Debé, Burkina Faso, wants to sell a 120-kilogram sack of onions. • A SOCAMAD member trained by MISTOWA to surf the West African Trade portal site www.wa - agritrade.net to seek buyers and compare prices "discovered" GAPTO (Ghana Agricultural Producers and Traders Organization) and arranged a two-way visit to conclude a trade deal.
Days 4 to 10 • Amadou, spends a day locating a truck to charter. Pays a fee to the laborers to load the truck and also pays the district tariff and market exit toll. Pays transportation to Ouagadougou 237 km away, official and unofficial fees en route, and labor to unload. *Amadou sells the sack of onions to Dramane a broker for $18.50, 10 days from the time it left Debé.*	Days 1 to 10 • A SOCAMAD delegation visited GAPTO in Accra to ascertain interest. A GAPTO delegation visited Debé to ascertain quality and discuss terms of payment. SOCAMAD agreed to supply 455 (120-kilogram) sacks of maize delivered to Accra. Days 11 to 12 • SOCAMAD hire Birba, an intermediary to arrange transport and finalize export formalities. *Fatou does not have to travel to Tougan to look for a buyer but simply includes her sack at $4.75 among the 455 sacks.*
Days 11 to 20 • Dramane buys onions from other traders and stores them until a buyer comes. A week later Aliu Mahama, a Ghanaian trader, arrives. *Dramane sells the sack of onions to Aliu for $26.54 after taking his commission for storage and handling.* Dramane keeps buying from other brokers until his 30-ton truck is full. *20 days since the sack left Debé, Dramane is ready to take the onions for sale in Accra.* He pays for his truck and labor to load. His driver pays an exit toll and Aliu travels nearly a day to reach the Burkina Faso/Ghana border post at Paga.	Days 13 to 16 • SOCAMAD loads 455 sacks of onions to embark on the 1265-km journey from Debé to Accra. Birba and the driver spent 2 hours at the Burkina Faso/Ghana border at Paga because they had the proper import/export documentation. Due to policy changes from pressure by associations who attended the MISTOWA advocacy training, Birba is stopped by fewer unofficial checkpoints. When he is stopped, he explains to the police his knowledge of his rights and the illegality of the stop. Intimidated by Birba's awareness and negotiation skills, the officer decides to let him pass without paying any extra fees. • After a 3-days trip, Birba arrives in Accra and is met by GAPTO to escort him to the Agbogbloshie market. No illegal fees were paid and GAPTO members provided unloading labor. *After only 16 days since the negotiations started between SOCAMAD and GAPTO, onions are delivered to GAPTO in Accra at a cost of $29.88.*
Days 21 to 30 • They spend 2 days at the border to complete import formalities. At the border, Aliu pays custom's duties and to ensure a quick passage he pays an "unofficial fee." Aliu travels from Paga to Accra where they were made to stop 27 times, 15 of which were check points. Each official cites a new violation or demands that a tariff be paid. Not knowing if the violations are true, he pays "unofficial" fees to speed up his trip. • After an 8-day trip including breakdowns, Aliu finally arrives in Accra. After paying the "market queen" to enter the market, pays labor to unload and *sells the sack of onions to Araba, a wholesale trader at the Makola market, for $56.09, 30 days since the sack left Debé.*	Days 17 to 19 • *GAPTO sold the 16-day old onions to retailers at $33.87* within 2 days of arrival. Days 20 to 25 At the Agbogloshie market, Maame Yaa, a retailer, purchases the onions from GAPTO and begins to sell the 20-day-old onions to consumers *until the last kilogram was sold 25 days since departure from Debé at a retail price of $38.95 ($0.32/kg).*
Days 31 to 45 At the Makola market, Afua, a retailer, purchases the onions from Araba and begins to sell the month-old onions to consumers *until the last kilogram was sold 45 days since departure from Debé at a retail price of $65.65 ($0.48/kg).*	

Onion marketing cost structure with and without MISTOWA intervention: The case of the Debé, Burkina Faso– Accra, Ghana marketing channel
(Exchange rates: US $1 = 9100 Ghana Cedis; US $1 = 545 CFA; 1 CFA = 16.7 Ghana Cedis; 1 Ghana Cedi = 0.060 CFA)

Duration of Transaction		Situation without MISTOWA	US $	
		SOCAMAD farmers sell a sack (120kg) of onions		
Days 1 to 3		**at the Tougan Assembly market**		
	1	Cost of producing a sack (120 kg) of onions at Debé		**3.60**
	2	Cost of loading truck at Debé farm		0.20
	3	Transport to assembly market at Tougan (61 km)		0.67
	4	Cost of unloading at Tougan assembly market		0.20
	5	Landed cost at Tougan assembly market	**4.67**	
	6	Producer's margin (10% of landed cost)	0.93	
	7	Producer price at Tougan	**5.60**	
Days 4 to 10		**Local trader buys from Tougan assembly market**		
		for sale in Ouagadougou wholesale market		
	8	Cost of a sack of onions (120 kg) at Tougan		**5.60**
	9	Cost of loading into truck		0.30
	10	Transportation cost from Tougan to Ouagadougou (237 km)		2.60
	11	Unofficial payments Tougan to Ouagadougou (2 check points)		4.00
	12	Market toll (official payment) on Ougadougou wholesale market		2.00
	13	Cost of unloading at Ouagadougou wholesale market		0.30
	14	Landed cost at Ouagadougou wholesale market	**14.80**	
	15	Trader's margin (15% of landed cost)	3.70	
	16	Wholesale price at Ouagadougou	**18.50**	
Days 11 to 20		**A broker buys, takes commission for handling and**		
		resells to Trader No. 2 in the Ouagadougou market		
	17	Cost price		**18.50**
	18	Storage and handling costs		3.62
	19	Total cost at broker's warehouse	**22.12**	
	20	Broker's margin (20% of cost)	4.42	
	21	Final Price of maize in Ouaga market	**26.54**	
Days 21 to 30		**Trader No. 2 sells to Trader 3 for resale in Accra, Ghana**		
	22	Cost price		**26.54**
	23	Official payments to complete export formalities		3.00
	24	Cost of loading into truck		0.20
	25	Transportation cost from Ouagadougou to Accra (1000 km)		9.17
	26	Official payments for border formalities at Paga (exit from Burkina Faso)		1.20
	27	Official payments for border formalities at Paga (entry into Ghana)		1.65
	28	Unofficial payments Accra to Ouagadougou (12 stops & 15 check points)		3.20
	29	Unofficial payments to "Market Queen" to unload in wholesale market		1.60
	30	Cost of unloading at Accra wholesale market		0.18
	31	Landed cost in Accra wholesale market	**46.74**	
	32	Trader's margin (20% of landed cost)	9.35	
	33	Wholesale price at Accra wholesale market (120 kg)	**56.09**	
		Wholesale price at Accra wholesale market (1 kg)	*0.43*	
Days 11 to 45		**Retailer buys from the wholesale market, sells**		
		to final consumer		
	34	Wholesale price		**56.09**
	35	Storage and handling costs		1.00
	36	Landed cost in retail market	**57.09**	
	37	Retailer's margin (15% of landed cost)	8.56	
	38	Consumer price	**65.65**	
		Retail price at Accra retail market (1 kg)	*0.48*	
		Producer's share of the final consumer price		**8.50%**

Duration of Transaction		Situation with MISTOWA	US $	
		SOCAMAD farmers sell a sack (120 kg) of onions		
		on-farm in Debe, Burkina Faso		
	1	Cost of producing a sack (120 kg) of onions at Debé		**3.60**
	2	Cost of loading truck at Debé farm		0.20
	3	Farm-gate price	**3.80**	
	4	Producer's margin (25% of farm-gate price)	0.95	
	5	Producer's price at Debé	**4.75**	
		SOCAMAD farmers contacted GAPTO through		
Days 1 to16		**MISTOWA Trade Portal. Sent delegation to Accra and**		
		proposed the supply of 455 sacks of onions		
		GAPTO delegation went to Debé to conclude deal		
	6	Purchase price at Debé/sack of 120 kg		**4.75**
	7	Cost of loading into truck		0.30
	8	Official payments to complete export formalities		3.00
	9	Transportation (Debé to Accra, 1265 km)		8.50
	10	Official payments for border formalities at Paga (exit from Burkina Faso)		1.20
	11	Official payments for border formalities at Paga (entry into Ghana)		1.65
	12	Unofficial payments Debé to Accra (23 stops & 15 check points)		5.00
	13	Cost of unloading in Accra		0.5
	14	Landed cost to GAPTO in Accra	**24.90**	
	15	SOCAMAD intermediary's margin (20% of landed cost)	4.98	
	16	Total cost delivered to GAPTO	**29.88**	
	17	GAPTO margin (10%)	2.99	
	18	GAPTO Wholesale price (120 kg)	**32.87**	
		GAPTO Wholesale price (120 kg)	*0.27*	
Days 17 to 19		**Retailer buys from GAPTO & sells to final consumer**		
Days 20 to 25	19	Wholesale price		**32.87**
	20	Storage and handling costs		1.00
	21	Landed cost in retail market	**33.87**	
	22	Retailer's margin (15% of landed cost)	5.08	
	23	Consumer price	**38.95**	
		Retail price at Accra retail market (1 kg)	*0.32*	
		Producer's share of the final consumer price		**12.20%**

From Thousands to Millions—Linking Farmers to Markets Through Scale-Up of the CASE Approach

From Thousands to Millions: Accelerating Sustainable Agricultural Intensification and Economic Growth in West Africa, or 1000s+, will strengthen the capacities of 1 million farming families—involving 10 million people—to innovate and profit from market opportunities in selected target areas of five West African countries, says Dr. Arnoldus J. Maatman, Chief of Party – SAADA. 1000s+ will also reinforce the capacities of 2,000 local enterprises, including farmer cooperatives and business development services, in Benin, Burkina Faso, Ghana, Mali, and Nigeria to engage in input distribution, processing, storage, and marketing of agricultural products, and to facilitate agricultural intensification. 1000s+ is Part A of a Strategic Alliance for Agricultural Development between DGIS of the Netherlands and IFDC (see box below).

Expected results of the project are:

- A 50% average increase in agricultural productivity and a 30% average income growth for 1 million rural farm households.
- A measurable increase in environmentally sustainable production on an additional 2 million ha of farmland.
- Improved food security through an increase in aggregated agricultural productivity of 500,000 tons of cereal equivalents.

Strategic Alliance for Agricultural Development in Africa (SAADA)

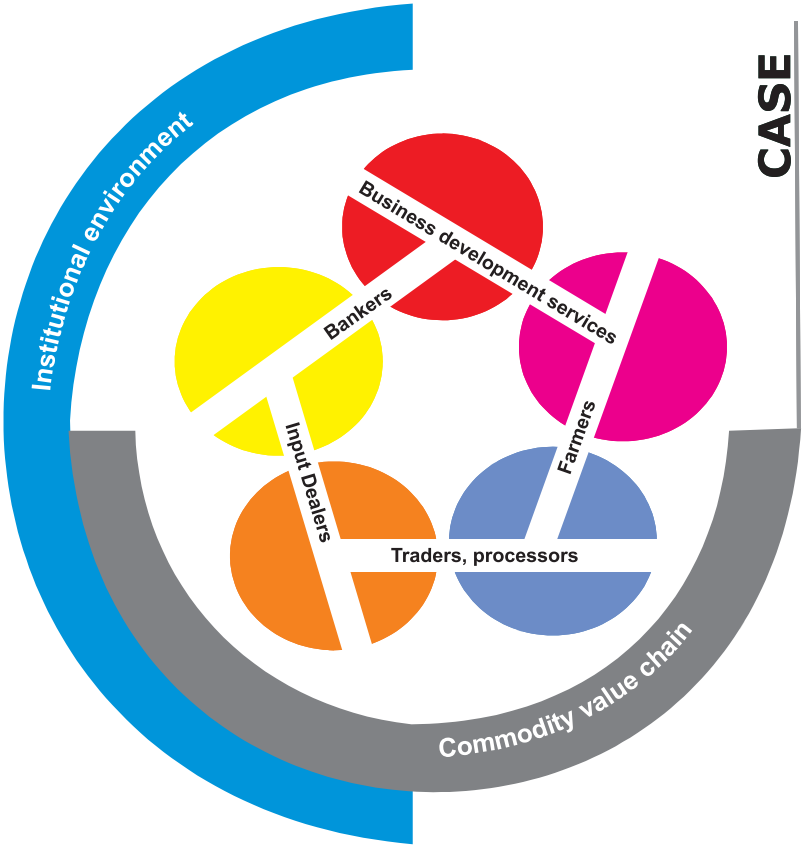
Building an effective agricultural sector requires simultaneous efforts on many interlinked elements. The SAADA grant will enable IFDC to use proven techniques to develop competitive agricultural systems and viable agri-enterprises based on sustainable intensification of agricultural production and commodity chain development. IFDC proposes a three-pronged program to maximize SAADA's impact.

- **First, IFDC has designed a project to scale up the successful CASE approach in West Africa to take advantage of the solid foundation and opportunity to transform rural livelihoods in Benin, Burkina Faso, Ghana, Mali, and Nigeria. The project, *From Thousands to Millions*, will increase economic growth and agricultural productivity, thus improving food security and rural welfare.**
- **Second, IFDC will expand and replicate the CASE approach in other critical areas of Africa, such as the Horn of Africa and the Great Lakes region. Groundwork has been done; proven systems are available that make such an expansion feasible.**
- **Third, IFDC will extend its experience and add new thematic elements to provide special focus on women and trade capacity building, and to meet the declining conditions that reduce or inhibit the capacity of African rural populations to improve agricultural productivity: increasing environmental degradation, the spread of HIV/AIDS, conflict, and poor governance.**

The program will accelerate implementation of the Comprehensive Africa Agriculture Development Program (CAADP) of NEPAD. It will contribute to the target of 6% annual growth in agricultural productivity and provide measurable results toward meeting the Millennium Development Goals 1 (eradication of extreme poverty and hunger), 3 (promotion of gender equity and empowerment of women), 6 (combat HIV/AIDS), and 7 (ensure environmental sustainability). The project will also indirectly contribute to achieving Goal 4 (reduce child mortality).

- More effective private sector capacity to serve farmers. The 2,000 project beneficiary dealers, traders, processors, and others are expected to increase their business by an estimated 50% and to expand the number of retail and other enterprises, and of employees, by another 50%.

"*1000s+* uses a proven method for agricultural development for resource-poor farmers in Africa," Maatman says. Four well-known concepts are at the basis of the CASE approach: (1) *ISFM*, or the judicious use of mineral fertilizers combined with locally available organic amendments to increase land productivity and to maintain or enhance soil fertility and improve environmental quality; (2) *agri-business cluster formation*, which aims to strengthen the competencies of and linkages among the principal actors at the grassroots (for example, farmers; entrepreneurs involved in the production and distribution of inputs and processing, storage and marketing of agricultural products; business development services; and bankers); (3) *development and strengthening of commodity chains* by improving efficiency of markets and coordination between the agribusiness clusters and national and international markets; and (4) facilitation of a constructive dialogue between public and private sectors to build *favorable market environments*, particularly the selected clusters and commodity value chains. While ISFM is an "entry-point" methodology to start working with farmers and farmer groups and to build confidence, the three other concepts jointly constitute what we call the "pillars" of sustainable agricultural intensification. The figure above gives a schematic presentation of the CASE approach.



Cluster building: strengthening of capacities and of coordination among the principal actors (farmers, input suppliers, processors and traders of agricultural produce, business development services, and bankers). The term "entrepreneurs" may be somewhat misleading, because farmers, bankers, and business development services are also entrepreneurs. Also in the "entrepreneurs" (inputs) or (outputs) circles are farmer cooperatives that supply inputs or market agricultural products.

The CASE approach evolved partly from ISFM projects such as FSAD and FfF and partly from recognition that technology-push strategies to promote risky agricultural intensification processes rarely work. Profound changes at the grassroots level are often needed to enable farmers to invest in external inputs such as improved seeds, fertilizers, CPPs, and adequate equipment. Such changes include: (1) improved access to inputs, credit, and adequate information; (2) stronger management competencies of farmers, local entrepreneurs, and grassroots organizations; and (3) better coordination among farmers, local

entrepreneurs (including farmer cooperatives) involved in processing, storage, and/or trade; and the principal actors and facilitating organizations, including credit institutions and NGOs. The CASE approach strengthens innovative competencies, including those needed to improve coordination among the various actors at both local and regional levels and within specific commodity chains without substituting for market agents. CASE facilitates; the responsibility for development stays with the primary actors at the grassroots level.

"More than 125,000 farmers in West Africa have adopted ISFM technologies," Maatman says. Their average agricultural productivity has more than doubled, value:cost ratios of adopted ISFM options are well above 2, and farm-level incomes of ISFM farmers have increased by 20% to 50%. IFDC has helped establish farmer "learning groups" in 300 pilot villages, which are taking the lead in development and validation of ISFM options for a focused set of marketable products. Organizational capacities of the farmers in the pilot areas have improved markedly. Women in the pilot villages and the facilitating institutions play an important role in the ISFM project activities and related decision-making. As CASE evolved, IFDC trained more than 250 local entrepreneurs—input dealers, traders, and managers of warehouses and processing units.

The costs of the CASE approach have been estimated at about $50 per target farmer in our previous projects. When scaling up, the anticipated costs per farmer are estimated to decrease considerably. To this end the 1000s+ project will, among other things, leverage ongoing projects that already partially apply the CASE approach and incorporate the best practices of successful IFDC projects to develop agri-input markets and trade associations. The existing AISSA network of partner institutions, trained to provide capacity building on our already proven approaches for technical and institutional innovation, will allow us to accelerate the scaling up process at lower cost. Besides working with regional organizations and projects, IFDC plans to collaborate closely with AgriCord (a consortium of agri-agencies that includes Agriterra in the Netherlands, French Farmers and International Development (AFDI) in France, and the Union of Agriculture Producers/ Development International (UPA/DI) in Canada) and national and regional farmer organizations in West Africa, to ensure effective participation and control of farmer organizations within the 1000s+ project. The International Center for Development-Oriented Research in Agriculture (ICRA) will train national-level teams, to strengthen national capacity in facilitating the CASE approach.

Although agreement with DGIS was reached by late 2005, the contract and implementation letters were signed in April 2006. In anticipation of the contract, IFDC started discussing work plans and project management together with the AISSA network, AgriCord and national-level farmer organizations, and ICRA. The project should accomplish two critical operational objectives early after its start, and with the implementing partners, should simultaneously pursue a three-pronged programmatic approach for 2006. The goal has been to set the stage for a bottom up, participatory planning process while generating momentum, models, methodology, and motivation among staff and partners. The two major operational objectives are to:

- Establish the project office and have a fully functioning team and method of monitoring and evaluation in place by late June.
- Reach an agreement with AgriCord that will put a producer organization expert on the team in Bamako, and pair producer organization advisors with national cluster advisors, to integrate farmer capacity to organize, plan, and manage from the beginning.

Staffing for 2006 is almost complete and includes a project coordinator, an agribusiness specialist, cluster advisors in Benin, Burkina Faso, and Ghana (cluster advisors in Mali and Nigeria will be hired in 2007), and rural financing, gender, and participatory monitoring and evaluation

specialists. Staffing is kept low to maximize opportunities for subcontracting at the grassroots level, through business development services and farmer organizations, and to maintain flexibility in project cycle management. The latter is crucial as farmer organizations and farmer-led national committees are foreseen to play a major role in decision-making on the selection of clusters to add to the project portfolio, and the monitoring of services provided by AISSA and other facilitating institutions. The discussions with AgriCord continue; the dialogue also involves discussion and negotiations with farmer organizations at national and regional levels (for example, the Network of Farmer Organizations and Agricultural Producers [ROPPA]) in West Africa. Awaiting agreement with AgriCord and affiliated farmer organizations, only existing ISFM sites will be used to scale-up case approaches as learning opportunities; strategic choices of new cluster activities will be left in the hands of the farmer-led committees.

IFDC has an agreement with AgriCord, ICRA, and partner institutions in the AISSA network on the following three simultaneous programmatic themes for 2006:

1. Build on the existing CASE agribusiness clusters and use them as multipliers to scale up in neighboring areas.

   Activities in about 30 clusters in the five target countries, including a few in existing sites in Togo and Niger, have been discussed in stakeholder meetings in Benin, Niger, and Mali. Activities concentrate on the one hand on the "deepening" and capitalization of the CASE approach, as advised by the July 2006 external review of the ISFM project; and the scaling-up of results already achieved (extension of ISFM technologies, wider application of inventory credit systems, strengthening of farmer organizations in processing and marketing of agricultural products, training and support to input dealers and farmer cooperatives to increase efficiency of input delivery). Local project officers are actively involved in the planning of scaling-up activities of the CASE approach in existing clusters.

2. Facilitate and work with farmer-led national committees of stakeholders and "core" capacity strengthening teams to refine the implementation plan and to select strategic sites and commodities as the basis of the work and activity plan for year two (2007).

   ICRA will train and strengthen national capacity strengthening teams (NCSTs) in Mali and Benin. The team members will develop specific cluster business and national capacity strengthening plans. A memorandum of understanding with ICRA is being drafted that will ensure training of NCSTs from all five target countries over the next 3 years.

3. Take advantage of IFDC and other training programs and best practices in the region to train trainers and develop cadres of CASE/cluster experts who can champion the approach at the national level.

   Two international CASE training programs were conducted. One was in November 2005 in Bamako, Mali, for Francophone participants; the other was in April 2006 in Sogakope, Ghana, for Anglophones. The 40 participants included representatives of national farmer organizations, NGOs, and trader associations. A team from Kenya also participated in the Ghana CASE training. Participants are preparing business plans for CASE approaches in their countries.

Favorable Socioeconomic and Policy Environments for Soil Fertility Improvement

The Favorable Socioeconomic and Policy Environments for Soil Fertility Improvement (FASEPE) project has promoted sustainable agricultural production and market development by improving socioeconomic and policy conditions in Burkina Faso, Ghana, and Mali since 1999. The 6-year project, funded by the Government of the Netherlands, ended in 2005. The FASEPE approach was to guide farmers and the private sector, and their organizations, in adopting practices that improve soil fertility, agricultural production, farm incomes, and rural development, says Robert Groot, Director, IFDC Africa Division.

FASEPE accomplishments follow:

- Completed a study of, and provided technical assistance to, associations of private sector input dealers in Mali, Burkina Faso, and Ghana.
- Partnered with existing and new networks of MIS in Ghana, Mali, Burkina Faso, Togo, and Nigeria to form the African Agricultural Market Information Network (AFAMIN), and developed a web-based MIS for agricultural inputs.
- Organized workshops on soil fertility improvement for policymakers, and finalized a national action plan for soil fertility improvement in Mali.
- Helped develop regulatory systems for fertilizer and seed quality control that are compatible with open markets in Burkina Faso, Ghana, and Mali.
- Developed training materials for demand-driven capacity building, and conducted technical and advocacy training workshops for producer groups and trade associations.
- Helped establish federations of farmer organizations in Ghana, Mali, and Burkina Faso.
- Formed strategic alliances with farmer and dealer organizations in West Africa and other African countries.
- Continued promotion of soil fertility programs despite disappointments with national action plans.

The donor's evaluation at the end of the project concluded that FASEPE contributed to the sustainability of the agricultural input supply, and improved the socioeconomic and political environment for soil fertility management in West Africa. The FASEPE project improved awareness of soil fertility issues and increased both knowledge and organizational capacity of farmers, agri-input dealers and other public and private institutions. It helped IFDC work with NEPAD on the CAADP objectives and the Millennium Development Goals related to increasing agricultural production in Africa.

Policy, Trade, and Markets Program

Policy Dialogue and Reforms

Creating an enabling policy environment for market development and private sector participation remains a key objective of the Policy, Trade, and Markets (PTM) Program. IFDC staff traveled to several countries to help design and implement sound policies.

Nigeria

With DGIS funding, IFDC helped the Government of Nigeria draft and validate the National Fertilizer Policy Document. The IFDC team helped coordinate preparation of a national policy document concerning fertilizer import and production, research, extension, soil testing and fertilizer recommendations, and regulatory systems. The document also identified appropriate roles for public and private sector stakeholders in a partnership mode. More significantly, the national policy strongly emphasizes a private sector-based fertilizer distribution system, with a provision for market friendly safety nets. The draft policy document was validated at a national stakeholder workshop in April 2006 and was presented at the Africa Fertilizer Summit in June 2006 in Abuja.

Malawi

In August 2005, the Government of Malawi changed its policy on fertilizer distribution to a system that was not market friendly. It decided to distribute 147,000 tons of fertilizer products to 2 million farmers at a subsidized price and through government-owned parastatals. Private sector input dealers were excluded from the marketing of subsidized inputs. IFDC prepared several policy briefs and visited Malawi to have policy dialogue with the government and development partners to allow the private sector an appropriate role in fertilizer marketing. B. L. Bumb from IFDC also participated in the Malawi Fertilizer Sector Workshop in May 2006 in Lilongwe and gave a presentation on "Improving the Fertilizer Supply in Africa," proposing several options to help poor farmers in a market friendly manner while strengthening the functioning and performance of input markets.

Action Plan Development Work

Seed Sector Development in Mozambique

In collaboration with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), IFDC assessed seed and other input markets in Mozambique. An IFDC team visited Mozambique in September 2005 and interacted with several stakeholders in both the public and private sectors. Several constraints to input market development were identified, especially in the seed sector. Constraints were identified in the production of foundation seed and certified seed, quality control, and dealer networks. A limited number of private seed companies and their concentration in a few locations added to the cost of seed supply and use. The quality control system and limited number of dealers in rural areas also constrained the development of the seed market.

This assessment led to the launching of the Agricultural Input Markets Strengthening (AIMS) Project in 2006. The 30-month project is being implemented in collaboration with ICRISAT, International Institute for Tropical Agriculture (IITA), and Citizens Network for Foreign Affairs (CNFA). The project will focus on input market development, dealer training, seed production and marketing, and soil fertility restoration through cereal-legumes rotation. The project is headquartered at Beira. AIMS will also conduct feasibility studies on public-private partnership in seed production, and regional integration of fertilizer markets in Zambia, Malawi, Mozambique, and Zimbabwe through holding warehouse development and fertilizer production facilities at or near the Beira port.

Seed Sector Development in Tanzania

In collaboration with ICRISAT and Iowa State University, U.S.A., IFDC assessed the seed market in Tanzania. The assessment was sponsored by the Ministry of Agriculture and Food Security. The assessment team, which included stakeholders from both the public and private sectorS, visited Tanzania in January and February 2006, and traveled to several regions including Morogoro, Iringa, Mbeya, Makumbako, Arusha, and Kilimanjaro. Discussions were held with stakeholders from both public and private sectors and the donor community. The assessment team also interacted with a World Bank team visiting Tanzania to develop a follow-up agricultural sector development program.

Several constraints affecting the performance of seed production and marketing were identified. The existing system for foundation seed production lacked autonomy, authority, and accountability. The quality control and seed production systems were poorly developed. A lack of dealer networks in rural areas was the missing link between seed production and seed use. The assessment team made several suggestions for improving the seed supply system related to an enabling policy environment, public and private partnerships in seed production, an accreditation system for quality control, and seed production for sorghum and millet.

Seed Policy Harmonization Workshop, Lomé, Togo, December 2005

Under partial support from Sustainable Commercialization of Seed in Africa (SCOSA), IFDC organized a regional workshop for the West African Economic and Monetary Union (UEMOA) and ECOWAS. Attended by more than 100 stakeholders, draft documents on seed policy regulation and certification procedures were discussed. Due to technical problems, draft documents in French were validated at the workshop, but it was decided that after proper technical and legal translations, English documents should be validated at a future workshop.

Angola

The Ministry of Agriculture and Rural Development organized a workshop, attended by policymakers, donors, and other stakeholders, on Market-Oriented Family Production Agriculture n July 2006. Dr. Maria Wanzala, IFDC/NEPAD Coordinator, gave a presentation on "Developing Agricultural Input Markets: Challenges and Options for Angola." The presentation focused on issues in market development and market-friendly safety nets based on the voucher system. IFDC's experiences in implementing voucher systems in Malawi, Nigeria, and Afghanistan were discussed in detail. The World Bank, European Union (EU), and the Ministry expressed a desire to implement an IFDC-type market development project, using a voucher system, in Angola. IFDC will continue to work with the Government of Angola and development partners to develop and implement such a project.

Project Implementation Experiences

- Malawi AIMs Project
- MIR Project
- MISTOWA Project
- Afghanistan Projects
- Uganda Project
- Kyrgyzstan Project

Marketing Inputs Regionally

IFDC is implementing a 5-year project that will strengthen the private sector and facilitate dialogue among stakeholders with the aim of developing the regional agri-input market in West Africa. The project is setting the stage for improved market efficiency and increased competition. Key activities are the reform and harmonization of policies, regulations, and practices related to seeds, fertilizers, and CPPs for the region. The project is supporting the creation and the strengthening of national and regional agri-input trade associations. It is training and supporting the emerging input businesses while reinforcing the MIS, at both the national and regional levels. Special attention is given to the cotton sector inputs for increased competitiveness in the global market. The project coordination is based in Burkina Faso with offices in Benin, Ghana, Mali, Nigeria, and Togo.

Since June 2004, the Marketing Inputs Regionally (MIR) project has accomplished the following:

- Facilitated the development of a regional seed legislation, in collaboration with UEMOA and ECOWAS. This legislation includes a "Common Catalog of Plant Species and Varieties Cultivated" in the Member State and "Proposed Norms for the Harmonization of Seed Quality Control and Certification." It is expected to be adopted by UEMOA and ECOWAS in 2006.
- Supported the drafting of the Economic Community of West African Agricultural Policy (ECOWAP). Because of the active participation of MIR as a task force member involved in the drafting of the policy, a specific paragraph on agri-inputs and soil fertility has been added to the final ECOWAS agricultural policy document adopted in January 2005.
- Assisted ECOWAS in the development of its regional strategy of fertilizer promotion for the African Fertilizer Summit in Abuja in June 2006.

- Co-organized a regional workshop to develop a road map for regional regulations for CPPs. This workshop aimed at developing a roadmap for harmonizing the regulatory framework for plant protection products in West Africa. The 34 participants from the public sector, private sector, and regional and international organizations adopted the roadmap. MIR is also facilitating the implementation of this road map.
- Launched a campaign to revise the tariffs on agri-inputs imported from countries outside the UEMOA zone. MIR undertook an awareness campaign on customs exemption rights on fertilizers imported from countries that are not in the UEMOA zone, in particular, urea. The report of this study will be used by farmer-based organizations for lobbying actions.
- Realized and displayed a 27-minute documentary film titled "Hope for West Africa Agro-Input Markets" in Burkina Faso, Benin, Togo and Ghana. The display was followed by a debate on input procurement in the region, with a panel of stakeholders of the input market and all participants. Further to this activity, other IFDC projects as well as outside partners used the documentary film as a basis of training and sensitization activities.
- Facilitated six district-level workshops with the Malian Permanent Assembly of Agriculture Chambers (APCAM) in order to identify the constraints of input purchase and to make recommendations. This analysis and the recommendations were synthesized during a national workshop in July 2006. MIR has already started some follow-up activities to improve the input procurement process.
- Supported the creation of the National Seed Association of Benin in May 2006 and supported the institutional and organizational development of national agri-input trade associations in Ghana, Burkina Faso, Togo and Nigeria. MIR also facilitated a regional workshop for these associations, to help them share their experiences and discuss the issue of professionalization of their members.
- Helped create the Federation of African Agricultural Input Trade Associations (FACIA), which was launched in October 2004. The Federation comprises 33 country agri-input trade associations from 14 West and Central African countries, giving a single advocacy voice to more than 4,900 agri-input traders in the region. MIR supported the Executive Secretary of FACIA in his first activities.
- Facilitated in September 2005 a federal strengthening workshop for four State level Nigerian agri-input dealers' associations, which led to the set up of a Joint Action Committee (JAC). Since September 2005, the JAC lobbied the Federal Government to adopt a regulation on fertilizers.
- Facilitated Trainings of Trainers on safe use of CPPs in Mali, Senegal, Ghana and Côte d'Ivoire, in collaboration with CropLife Africa Middle-East (representing the plant science industry). The trained participants represent the private and the public sectors and will, on their turn, train input dealers and farmers on the safe and responsible use of agri-inputs.
- Organized in February 2006 a study tour of farmers and researchers to the International Agriculture Trade of Paris. After the tour, trials to improve and adapt to the current needs of the cotton fertilizer formula were launched in four West African countries with support of private fertilizer suppliers.
- Launched in collaboration with the West and Central African Council for Agricultural Research and Development a series of trials of trap plants associated with cotton (Benin, Togo, Burkina Faso and Mali). The aim is to develop new strategies to protect cotton from its main pests.
- Co-organized a workshop on bio-security and biotechnology in West Africa. This workshop, which attracted about 30 participants from different countries of West and Central Africa, helped to introduce new seed technologies and to strengthen the research capabilities in their decisions on biotechnology and bio-safety issues. It also reopened the dialogue between the MIR cotton partners and the seed profession on biotechnology issues. In 2006, MIR co-organized a regional workshop on Intellectual

Property Protection to sensitize and inform researchers on the procedure to protect their cotton varieties.
- Published a study report on the statement of the agri-input market of Benin. This report gives a statement of the market, identifies the obstacles related to its development, and suggests some recommendations for its strengthening.

Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites (Nigeria)

The 5-year Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites (MARKETS) project focuses on expanding economic opportunities in the agricultural sector by increasing agricultural productivity, enhancing value-added processing, and increasing commercialization through private sector-led and market-driven growth and development.

The project aims to transform Nigerian agriculture in selected areas from low input/low output, subsistence farming to commercially competitive agriculture. It will identify and address priority food and cash crop/non-crop systems where productivity gains will lead to (1) significant impacts on the economy and (2) improvements in household livelihoods of those involved in the agriculture sector.

"IFDC's role is to help improve the agri-inputs supply system to enhance the sale of improved seeds, fertilizers, and CPPs by working with producers, importers, wholesale/retail agri-input dealers, and project clients that use inputs," says Dan Waterman, Director of the Training and Workshop Coordination Department at Headquarters in Muscle Shoals, Alabama (U.S.A.). He added, "In that way the MARKETS project can build on the success of the 3-year IFDC DAIMINA [Developing Agri-Input Markets in Nigeria] project."

Waterman continues, "Driven by the identified demand for specific yield-enhancing products and their use technologies, MARKETS will formulate an input supply and technology transfer strategy for each target commodity and organize the training and networking of agri-input dealers and the technology transfer for outgrowers and other crop producers."

MARKETS will disseminate and improve skills in product knowledge, marketing, business management and input use technologies/practices as demanded by farmers and agri-input dealers, through a variety of activities. For example, the project will help the dealers to strengthen their business, expand their networks, and improve their extension services and institutional capability. The project will conduct participatory field demonstrations via learning centers and provide technical information.

MARKETS will also establish Commodity Production Sites, which are high potential geographic sites for sorghum, rice, and cowpea that will capitalize on previous efforts and investments.

An IFDC long-term advisor will provide technical advice to the project leadership and to the agri-input coordinators and help ensure that relevant project objectives and targets are met, in particular the total supply of fertilizer and the number of farmers networked.

Advice will also be offered to Nigerian manufacturers, producers, importers, and wholesale/retail agri-input dealers. IFDC staff will organize training on efficient handling and storage methods, logistics planning, and knowledge of inputs, sales promotion, and credit sales.

The IFDC team will oversee on-farm demonstrations of improved technologies/practices and develop training materials and facilitate targeted training in collaboration with business partners, importers of fertilizers and CPPs, producers of seeds in Nigeria, and extension agents. They will also provide advice to the agri-input trade associations.

Waterman says, “The objectives are to maximize the ability of dealers to supply project clients, minimize transaction costs, and expand the adoption of improved inputs needed to increase production and quality.”

Uganda Agricultural Production Enhancement Program

Since 2004 IFDC has been participating in a project to expand the economic opportunities in the Uganda agricultural sector by increasing agricultural productivity and marketing of key food and cash crops. The project seeks to move a substantial number of subsistence farmers to a commercial and profitable orientation. IFDC provides short-term technical expertise to promote improved performance in the agricultural inputs markets. Initial activities focus on improving market transparency, developing the technical capacity and business knowledge of agricultural input dealers, strengthening trade linkages between Kenya agricultural input importers/wholesalers and Ugandan dealers, and updating fertilizer recommendations for key crops—coffee, banana, and cotton.

Results:

- More than 310 agricultural dealers and producer organization trainers were trained during the 7 training workshops conducted throughout Uganda. The topics covered were international fertilizer situation, trading, management of small and medium enterprises, and technical aspects of fertilizers, seed, and CPPs.
- More than 400 copies of the IFDC agri-input retailer guide have been distributed.
- A monthly newsletter containing information on input prices, global trends, and tip of the month has been in publication since January 2005.
- A prototype fertilizer recommendation system has been developed for field validation.

The Role of Input Vouchers in Pro-Poor Growth

Approximately three-quarters of the 230 million ha of farmed land in sub-Saharan Africa is degraded and about 70 million smallholder farm families are caught in a poverty trap of declining agricultural productivity, degrading soils, food insecurity, limited market participation, and off-farm employment opportunities. An estimated 80% of these smallholder families struggle to survive below the poverty line on less than a dollar a day. A major cause is low farm productivity. Soil nutrient depletion is a significant factor in low agricultural productivity. As a result, grain yield in Africa has stagnated at 1 ton/ha for two decades and grain imports will need to be over 60 million tons per year by 2010. Soil nutrient depletion has reached more than 60 kg/ha in 21 countries and between 30 and 60 kg/ha in another 22 countries in sub-Saharan Africa. The declining fertility of

Fertilizer vouchers used in Afghanistan.

African soils because of nutrient mining is one of the main causes of stagnating crop yields and declining per capita food production. In the longer term it is a key source of land degradation and environmental damage.

IFDC has reviewed some of the supply- and demand-side constraints to increased fertilizer use and defined the attributes of pro-poor growth. This is defined as growth that benefits the poor. Current agricultural development programs based on identified markets for value chain development benefit the smallholder participants through new technology adoption and access to remunerative markets. The paucity of evidence that these programs create a trickle-down effect to the millions of non-participatory smallholder families demands a fresh examination of how rural development can be implemented that will create opportunities for these millions to increase productivity, diversify cropping, and fully participate in markets.

Holistic development programs are required that are pro-poor. The use of input vouchers is presented as a flexible development tool for jump-starting this participation for the poor. IFDC's experience with input vouchers in Malawi, Afghanistan, and Nigeria (each program with different objectives) illustrates how both smallholder farmers and small input dealers can benefit. Vouchers, however, are only "smart subsidies" and must be matched by holistic development assistance for the targeted poor. The cost and medium- to long-term horizons to reach sustainability are substantial and require that considerable analysis, objective setting, and implementation planning be performed prior to embracing this useful policy tool.

Rebuilding Agricultural Markets in Afghanistan Program

Since February 2004 IFDC has been participating as a subcontractor in the Rebuilding Agricultural Markets in Afghanistan Program (RAMP) that aims to restore food security in devastated Afghanistan by increasing agricultural productivity and output and by improving linkages among producers, processors, and markets. IFDC is working to develop the agricultural input market system. This project was later expanded to include a divestment study of the Afghan Fertilizer Company. In spite of challenging security since March 2004, the project has achieved significant results to date including:

- Trained more than 2,521 agri-input dealers, importers, retailers, and extension workers.
- Collaborated with the International Center for Agricultural Research in the Dry Areas (ICARDA), FAO, and other NGOs to organize field demonstrations to demonstrate crop production and input use technologies.
- Published and disseminated more than 37,000 wall posters, charts, leaflets, and brochures on 20 different topics and distributed the materials to agri-input dealers, farmers, and extension workers.
- Conducted a market survey to obtain current and reliable information on the status of dealer development and marketing infrastructure.
- Facilitated the formation and registration of seven provincial associations and one national association of agri-input dealers. The executive members of the associations were trained in policy dialogue, business promotion, and networking.
- Facilitated the procurement of inputs from wholesale dealers and importers and trained the dealers in business negotiations.
- Initiated a marketing information system by collecting and disseminating current and reliable information on prices of inputs and crop produce in Afghanistan and regional markets.
- Established a loan program under a job order from RAMP. Eight agri-input companies were given loans for seed production and fertilizer procurement.
- Facilitated business linkages between agri-input dealers, importers, producers, financial institutions, extension agents, and NGOs to promote business confidence and enhance business dealings.
- Supported implementation of the Agricultural Input Supply Program (AISP) and Agricultural

Marketing and Production Support (AMPS) activity.

The activities of the Agricultural Input Dealer Training and Development Project (AIDTDP) have increased the usage of high-quality fertilizers in several provinces. Furthermore, the training programs have enabled the dealers to work directly with the farmers and explain why price is not the only criteria when selecting a fertilizer. The activities of the project have linked remote retailers with importers to improve both the quality and quantity of fertilizer available to the farmers of Afghanistan. Improved business linkages in the marketing system have also resulted in a positive impact on the timeliness of fertilizer supply availability. The project is playing a key role in developing the dealers of Afghanistan to act as a single group and to have a voice in their future.

Food for Agricultural Revitalization and Market Systems

The U.S. Department of Agriculture (USDA), through its Food for Progress Program (FFP), recently awarded IFDC a grant to monetize 5,150 tons of soybean oil in Afghanistan and 10,000 tons of soybeans in Pakistan. IFDC will use all proceeds from the commodity sales to implement the Food for Agricultural Revitalization and Market Systems (FARMS) project in Afghanistan. FARMS provides technical assistance in improved nutrient management for food crops (wheat, maize, vegetables) and higher-value crops such as oilseeds (peanut, soybean), along with technical and market development assistance to the existing milling industry.

"The ultimate goal of FARMS is to replace imports of some staple foods and food products, such as flour and cooking oil, with competitive domestic production," says Dr. Deborah Hellums, Coordinator – Field Projects.

Experience has shown that widespread dissemination to farmers of information on improved nutrient management techniques quickly increases crop production. IFDC will identify up-to-date nutrient management techniques for important crops to disseminate by combining results from site-specific on-farm demonstrations and research trials.

"We'll analyze various nutrient management practices and use DSSs to develop nationwide recommendations that will increase land productivity and reduce risks to farmers," Hellums says. In the spring of 2006, IFDC began partnering with the Afghanistan Ministry of Agriculture and its extension staff to conduct site-specific research and on-farm trials in five important agro-ecological zones. The field data will be combined with DSS tools such as crop simulation models and GIS, and with geo-referenced databases, to identify appropriate nutrient management practices and production capabilities.

"A viable market is needed to absorb the increased crop output, so we'll focus simultaneously on market development," Hellums explains. "We'll link farmers with processors—millers and oilseed crushers—to add value to the produce and give farmers more incentives to increase production."

A significant part of the income generated will be used to support market development by increasing the capacity and efficiency of the domestic milling, or flour, industry. The initial focus will be on training programs and workshops to transfer information on the latest technologies and equipment, to identify credit sources for upgrading or buying equipment, to disseminate market information, and on a media campaign to promote production and consumption.

The FARMS project is a natural complement to IFDC's agricultural development activities because the USDA FFP programs promote development of the private sector in developing countries and emerging democracies, Hellums points out. For example, IFDC's other activities in Afghanistan focus on helping input dealers source quality and competitively priced agri-inputs such

as seeds, fertilizers, and CPPs from international suppliers. These activities address the first link in the value-added commodity chain by providing Afghan farmers with timely and affordable access to agri-inputs. IFDC experience in the Balkans, Central Asia, and West Africa has shown that providing technical support simultaneously to the various stakeholders—input suppliers, farmers, and food processors—helps develop sustainable value-added commodity chains that benefit everyone, including consumers. In Afghanistan, these linkages will be instrumental in reaching the ultimate goal of increased domestic production of staple foods, and will provide a foundation for continued development.

Agricultural Marketing and Production Support

Activity in Afghanistan

The Agricultural Marketing and Production Support (AMPS) activity helps the Afghanistan government combat the cultivation of illicit crops by distributing seed for legal crops, along with fertilizer, throughout the country.

"We want to lessen the economic hardship that farmers face when they quit growing a profitable, but illegal, crop, and to encourage them from reverting to illicit crops in the future," says John Allgood, IFDC Director, Finance and Administration Department.

A steering committee has been formed to assist the provincial and district implementing partners. The committee consists of members from the Ministry of Agriculture, Animal Health, and Food (MAAHF); the Ministry of Reconstruction and Rural Development (MRRD); the Ministry of Counter-Narcotics (MoCN); the British Department for International Development (DFID); USAID's Alternative Livelihoods implementing contractors including Chemonics; and IFDC. The committee provides guidance in beneficiary selection and uses for collected funds, in validating provincial and district implementation plans, in providing ministers with progress status, and overseeing promotional campaigns. MAAHF took the lead in farmer selection, extension and training, and field distribution of vouchers to farmers. The USAID-funded RAMP project oversees the

promotional campaign, and helps the government highlight "alternative livelihood" messages. RAMP also provides vouchers that farmers exchange for seed and fertilizer, and bags that certified private dealers use to divide 50-kg bags of seed and DAP into two 25-kg portions for individual farmers.

As an implementing partner, IFDC distributes seeds, fertilizers, bags, and extension materials to private sector dealers at district locations. All seeds are bought from local suppliers and, along with fertilizers, are distributed to the beneficiary communities through a market friendly voucher program. "Technical packages" are prepared, consisting of enough seeds and fertilizers to plant one *jerib* (1 metric jerib equals 1 ha) of land: 50 kg of urea; 25 kg of DAP; and 25 kg of wheat seeds, 300 kg of potato seeds, or 1 kg of onion seeds. The technical packages have been distributed to more than 675,000 farmers in all 34 provinces. IFDC works with and trains private sector dealers to provide the quality of inputs necessary.

The AMPS timeframe is December 2005 to August 2006.

Albania: Farmers Increase Dairy Production

Shkelqim Hallulli's farm is located in Spitalle in the Durrës district of western Albania. Hallulli bought 10 pregnant Holstein heifers from Germany in December 2004 through the Livestock Entrepreneurs Association of Albania (LEAA). He purchased them through a loan of 2 million leke (or the equivalent of $19,415.21) provided by the FFP warranty fund. All of the cows are now in lactation and he gets 250 liters of milk from them with an average production of 25 liters per cow per day.

LEAA specialists have closely supported Hallulli in farm management, providing recommendations on barn construction, animal feeding, animal health, market information, etc. LEAA believes that Hallulli's good attitude and his willingness to apply recommendations are the key factors for his success. Hallulli accurately applies the feeding ratio provided by the LEAA specialist and has his cows checked periodically by the local and LEAA veterinarians. He has been in negotiations with the area artificial insemination technician to inseminate his cows with imported Holstein semen from World Wide Sires. Hallulli has kept all the calves on the farm and, unlike many farmers, he is applying a fattening program to sell the male calves at an older age for a better price.

In addition to the cows feeding ratio during lactation and dry period and the preparation of the fattening program for calves, LEAA specialists have prepared record books to be used in this farm on: (1) milk and meat production, (2) insemination applied, and (3) offspring (male and female) record.

Due to the use of a recommended feeding ratio, Hallulli improved the general health condition of his cows, increased milk production, and lowered costs. Initially, Hallulli used his own mix of 3 kg of corn, 2 kg of wheat bran, and 2 kg of soy per cow, combined with 10 kg of alfalfa grass and 5 kg of meadow grass. Based on this ratio, Hallulli used 422 leke ($4.17) per cow per day for feeding, getting an average of 20 liters of milk per cow per day, spending 21.1 leke ($0.21) for fodder per liter of milk.

LEAA specialists introduced Hallulli to another feeding ratio obtained from the Aiba Company, which included 7 kg of concentrate, 10 kg of alfalfa grass, and 5 kg of meadow grass. As a result of applying this ratio, average milk production was increased from 20 to 25 liters per cow per day, spending 17.5 leke ($0.17) on fodder per liter of milk.

Considering the progress so far, LEAA believes that Hallulli will continue to be known as a progressive farmer and will expand his farm in the future.

Bari Pepa is a farmer in Sejmenas, Lushnje district, and a member of LEAA since 2001. He is currently managing 30 Holstein cows imported from Germany through the association. All of the cows were purchased with his own capital. Initially, Pepa bought 17 cows in May 2004 and then he bought 5 more cows in December 2004 and another 8 cows in July 2005.

Production on his farm varies from 25 to 35 liters of milk per cow per day. A key factor for such results is related to feeding. Pepa applies all recommendations provided by the LEAA specialists in terms of feeding ratio concentrate mix and use of supplements, health care, reproduction, and hygiene. Working with LEAA specialists, he planned the cropping structure on his farm, considering the number of cows and their feeding needs, based on corn for silage, alfalfa, and lolium (ryegrass). LEAA helped him to calculate the surface for each crop and assisted during corn harvesting time and preparation of silage. This way Pepa managed to feed cows the proper amount (20 kg/herd) of good quality corn silage all year round. He used the corn silage in combination with alfalfa hay, lolium, wheat straw, and forage beet.

He also purchases concentrated animal feed from local companies and uses 6-7 kg/day as part of the feed. Pepa is one of the leading farmers to use vitamins as supplements and also mineral blocks in the feeding ratio. The use of Vita late and Aminovit has increased milk production on his farm. Because of Pepa's success, LEAA has used his farm as a demonstration farm to teach other farmers and transfer technology and good management practices to them.

IFDC Helps Chicken Farmers Increase Production

The Association and Business Management Center (ABMC), and the Albanian National Farmers Union (BKFSH), in collaboration with IFDC, introduced the use of balanced protein animal feed. This was done through the poultry project under the FFP program financed by USDA. The purpose was to help farmers produce more eggs and meat from the new hybrid chickens. The new hybrid was introduced, targeting two goals for smallholders in two directions—200 eggs per chicken per year and 2.0 kg and more meat per chicken. Extensive production and usage of balanced animal feed increases egg and meat production, and this is a major goal of BKFSH. The purpose was to introduce the balanced animal feed, the new hybrid, and the appropriate technology in chicken farm production and to help the Albanian farmers raise the new hybrid birds in the same conditions as traditional ones in rural areas with better results.

Experiment Overview

Usage of yellow maize and soybean meal, which contained 48% protein, was introduced in chicken farm production and yielded positive egg and meat production without biological effect for animals and humans.

The experiment was conducted in 33 farms throughout Albania with different climate and ecological conditions and differing incomes—poor vs. rich. Farmers who were very active members of BKFSH were selected. BKFSH appropriateness is based on its structure, which is dynamic in technology transfer and data collection. The visits to every farm showed the progress of the experiment. Data collection diaries with technology transfer were given to smallholders and data/study was collected from them in each demonstration.

One of the successful farmers who profited from this experiment was **Fatbardha Bejo** from Memaliaj in southeast Albania. She is 42 years old and has a family of seven, four of whom work on the farm. The farm is operated intensively; wheat, maize, and vegetables are all produced on 1.5 ha of arable land.

Bejo was one of the first farmers to introduce balanced feed in poultry farming in her area in May 2004. By using yellow maize and soybean meal—containing 48% protein—in the new hybrid chickens, she was able to get results twice as fast as with traditional chickens. Because of increased quality meat and profits, she decided to diversify her farm operations into chicken farm production for the market, and she became the marketer of chickens for the whole area (market, restaurants, and hotels). Since then she has doubled her profits and is expanding her operation. She plans to increase her production by at least 3,000 chickens by the end of 2006. ABMC assisted this farmer in the startup and identification of new sources for her business.

Because of this activity, the Albanian farmer has a better understanding of small-scale livestock operations. Knowledge of and access to improved feed formulations and improved breed genetics that increase meat quality and quantity in a timely and profitable manner improve the ability to profitably produce and respond to the growing demand for quality meat.

Farmers implemented new technologies, increased interest in the agricultural sector, and generated additional farm income. Thus, the encouragement to shift from subsistence operations based on traditional practices to more intensive regimes that utilize new technologies has been very effective.

Training: It's Integral to All of IFDC's Overseas Projects

Training is a major part of all IFDC activities. In 2005 IFDC's overseas projects conducted 352 training events for 12,372 people, of which 22% were women. IFDC projects in West Africa provided training for 5,700 stakeholders, of which 30% were women.

Most project training is aimed at developing agricultural input markets by upgrading the capabilities of the dealers who supply farmers with improved seeds, fertilizer, and other inputs. "The ultimate objective is to help small farmers increase productivity and income by improving their access to inputs and technology," says Dan Waterman, IFDC Director of Training and Workshop Coordination Department. "Private sector agri-input dealers when provided training in technical, business, and organizational skills serve as very effective vehicles and multipliers for transferring technology to hundreds of farmers each. Independent interviews and evaluations of our training programs confirm this," he added.

The Declaration of Africa Fertilizer Summit held in June in Abuja will inspire IFDC training programs and capacity building efforts for the rest of 2006 and beyond. The programs will focus on ways to implement the resolutions adopted at the Summit, including opening the regional markets for more trade and harmonization.

In addition to the training of dealers and others through its field projects, IFDC conducts international and regional training programs to promote best-practice use and foster interaction among key stakeholders. During the past year these included:

- **Phosphate Fertilizer Production Technology, September 26-30, Brussels, Belgium. This training event for engineers conducted on behalf of IFA was the third in the series. The program attracted 32 participants from 20 companies in 18 countries and involved 16 expert speakers and over 40 presentations and two plant visits. The participants evaluated the program as Very Good, increased their test scores by 28%, and offered valuable comments for the next such training planned for 2007.**
- **Competitive Agricultural Systems and Enterprises (CASE), November 14-18, in Ouagadougou, Burkina Faso (conducted in French). This inaugural program developed training modules based on the successful and innovative CASE approach. The FASEPE, MISTOWA, and other projects in the region sponsored 18 participants. There were 13 resource speakers from IFDC and elsewhere. The program was well received by the participants and will form the basis of another program on CASE.**
- **Fertilizer Marketing Management, December 5-16, Bangkok, Thailand. This "standard" 2-week training event was updated and revised substantially. The 18 participants accorded good marks to the program, which was co-sponsored by the Government of Thailand Department of Agricultural Extension and The Soil and Fertilizer Society of Thailand. In addition to the IFDC team, there were 10 Thai expert presenters. The program included 2 days of field trips.**
- **The CASE training program in Ghana, April 3-7, had 23 participants, mainly sponsored by the new Dutch-supported IFDC Thousands to Millions project in West Africa, but also included five participants from Kenya.**
- **The Sustainable Management of Agricultural Trader and Producer Organizations in Bamako, Mali, June 19-23, had 24 participants, mainly from West Africa sponsored by MISTOWA and other IFDC projects in the region.**

IFDC Hosts Eurasian Interns

Two agricultural specialists from the former Soviet bloc of Eurasia have completed 11-week internships at IFDC in Muscle Shoals. They were sponsored by the Special American Business Internship Training (SABIT) program of the U.S. Department of Commerce.

Ainagul Nasyrova (left) of Kyrgyzstan and Bakhtier Abduvohidov of Tajikistan in an Alabama cotton field.

Local businesses, state and government agencies, and civic organizations hosted the interns.

Ainagul Nasyrova, an agronomist, heads the Center for Agricultural Training and Extension in southern Kyrgyzstan. She manages a team of 26 professionals.

Bakhtier Abduvohidov is an agricultural economist and agri-credit specialist from Tajikistan. He manages a micro-finance program for a women's business association and has worked as a credit manager for Mercy Corps.

"The emerging markets of the Central Asian Republics present unique opportunities for U.S. companies and development organizations," says Dan Waterman, Director of the IFDC Training and Workshop Coordination Department. "The SABIT program builds partnerships and provides technical assistance by training Eurasian business leaders in U.S. business practices."

Such training directly supports Eurasian economic and civil society development by encouraging market-based reforms, while generating valuable export and investment opportunities for U.S. industry.

"The interns were exposed to IFDC programs and approaches to problem solving," Waterman says. "IFDC also gained knowledge from the interns that will help us improve and expand our work in Eurasia."

Cotton is vital to the economies of both Tajikistan and Kyrgyzstan, so Nasyrova and Abduvohidov studied how cotton is grown and processed in the United States, and visited a large cotton farm and cotton gin. They also studied poultry, fruit, and vegetable processing. They visited a fertilizer plant, the Alabama Cooperative Extension System, the Alabama Farmers Cooperative, and Alabama A&M University.

Project Portfolio

Project	Objective	Collaborators	Location
AMPS	Voucher program to provide fertilizer and see packages to resource-poor farmers to support Afghanistan's government program to combat the cultivation of illicit crops	MAAHF, MRRD, MoCN, agri-input dealers	Afghanistan
ANMAT	To promote the adoption of balanced fertilizer use and improved efficiency of fertilization in Bangladesh, Nepal, and Vietnam	NGOs, extension services	Bangladesh, Nepal, Vietnam
Uganda Agricultural Productivity Enhancement Program (APEP)	To expand economic opportunities in the Ugandan agricultural sector by increasing agricultural productivity and marketing of key food and cash crop systems	Input suppliers, distributors, and users (Chemonics)	Uganda
Batken and Sughd Agri-Input Dairy Development (BSAIDD)	To improve productivity and profitability of the selected AgFin+ project cheese and dairy farmers, reduce rural poverty, and increase stability in the region	Agri-input dealers, associations (DAI/Winrock – prime contractors for AgFin+ project)	Kyrgyzstan, Tajikistan
Cluster and Business Support in Kosovo	To stimulate economic growth and improve employment opportunities for Kosovars	Dealers, associations (Chemonics)	Kosovo
Combating Soil Fertility Decline to Implement Smallholder Agricultural Intensification in Sub-Saharan Africa (CSD-ISFM)	To improve the livelihoods of smallholder farmers in sub-Saharan Africa through the promotion of a holistic natural resource management (NRM) approach to agricultural intensification	TSBF-CIAT, NARES, NGOs, credit sources, farmer organizations	Sub-Saharan Africa, West Africa
Desert Margins Project	To mitigate the effect of drought and to combat desertification in Sub-Saharan Africa	NARES, NGOs decision makers, ICRISAT	Sahelian countries
Developing ISFM Options for Basil Production	To conduct a study for Darégal on improved ISFM for peri-urban agriculture, emphasizing basil cultivation around Lomé	Vegetable farmers	Lomé
Development and Dissemination of ISFM Practices	To improve plant nutrient management in resource-poor areas of SSA for smallholder farms	National partners TSBF	West Africa
Cereal Production Information and Decision Support Systems (CPIDS)	To conduct an applied research program to reduce farmer poverty through increased income, greater food availability, and reduced risks by improving agricultural planning and decision making	Farmers, policymakers NARS	Morocco, Syria
East and Central Africa Maize and Wheat Network Project	On-farm evaluation of maize varieties; soil fertility enhancement; soil moisture conservation; agronomic methods to control Striga	NARS scientist (CIMMYT)	Kenya, Ethiopia
Enterprise Development Project (EDP)	To improve agribusiness prospects in the Ferghana Valley in Central Asia	Agri-input dealers (Pragma)	Kyrgyzstan, Tajikistan, Uzbekistan

Project Portfolio
(continued)

Project	Objective	Collaborators	Location
Farmers for the Future in West Africa	To develop and introduce integrated soil fertility management packages aimed at intensifying agricultural production by small farmers	Farmers, NGOs	West Africa
FASEPE Project	To promote sustainable agricultural production and market development by improving necessary socio-economic and policy conditions	Farmer-based organizations, public and private sector	West Africa
Food for Progress Program (FFP)	To support private sector development of agri-business enterprises engaged in feed milling, meat, dairy, and egg production by providing technical assistance and linkages to world market sources and by promoting market development programs	Agricultural input dealers USDA, AAATA, and banks	Albania
ISFM Technical Assistance (Projet de Developpement Rural du Sud-Ouest (PDRSO)	Introduce integrated soil fertility management options in large investment projects in Burkina Faso	NARS and national NGOs	West Africa
KAED	To support the development of agro-input dealers and increase agricultural production through use of improved technologies	Agro-input dealers, decision makers	Kyrgyz Republic
Mali Agricultural Production Initiative (MAPI/PRODEPAM)	Increase agricultural productivity (irrigated agriculture, access to improved animal feeds, natural resources and environment, increased availability to inputs and technologies)	Farmers, input dealers (CLUSA)	Mali
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 agro dealers, farmers (Chemonics)	Nigeria
Romania Agribusiness Development Program	To develop competitive agribusiness clusters and promote policy reform to increase agribusiness prosperity	Dealers (Chemonics)	Romania
Strengthening Networks of Regional MISTOWA	To improve the collection and dissemination of market information and traders' organization networks	Several West African regional organizations Agriterra, Geekcorps	West Africa
Livestock Development Project in the Soum Province (PDES Project)	To enhance crop and animal production through integrated soil fertility management	NARES, NGOs in Burkina Faso	Soum Province, Burkina Faso
MIR	To strengthen the private sector and create a regional market in West Africa	UEMOA, ECOWAS, ROPPA, RECAO, CMA/WCA, private input importers and dealers, Sector Ministries	Burkina Faso, Benin, Ghana, Mali, Nigeria, Togo
RAMP	To provide agricultural dealer development expertise in a project designed to rebuild the agricultural markets of Afghanistan	Chemonics, agricultural inputs dealers	Afghanistan

Project Portfolio
(continued)

Project	Objective	Collaborators	Location
SAADA	Three-pronged approach to transform rural livelihoods to increase economic growth, agricultural productivity, and provide special focus on women and trade capacity building	AISSA Network, producer organizations	Sub-Saharan Africa
Southeast Climate Consortium Project	To develop a climate information and decision support system for the Southeastern U.S.A. that will contribute to an improved quality of life, increased profitability, decreased economic risks, and more ecologically sustainable management of agriculture, forestry, and water resources.	Florida State University, University of Florida, University of Miami, University of Georgia, Auburn University, University of Alabama-Huntsville	U.S.A.
Technical Back-stopping for IFAD and African Development Bank Investment Projects in Burkina Faso	To facilitate sustainable agricultural intensification and improve crop-livestock interactions	Farmers	Burkina Faso

Publications, 2005/06

FSR-2 *Asia Fertilizer Situation.*
FSR-5 *North America Fertilizer Capacity.*
FSR-7 *Worldwide Urea Capacity Listing by Plant*.
FSR-8 *Worldwide DAP and MAP Capacity Listing by Plant.*
FSR-9 *Worldwide Potash Capacity Listing by Plant*.
FSR-10 *Worldwide Ammonia Capacity Listing by Plant.*
FSR-14 *Worldwide Ammonium Nitrate and Calcium Ammonium Nitrate Capacity Listing by Plant*.
FSR-22 *Worldwide NPK Capacity Listing by Plant.*
FSR-23 *Worldwide Phosphoric Acid Capacity Listing by Plant.*
G 1 *IFDC Publications Catalog*.
P-34 *Restoring Kosovo's Agriculture Sector After Conflict—IFDC's Involvement*.
P-35 *An Action Plan for Developing Agricultural Input Markets in Tanzania*.
P-36 *An Action Plan for Developing Agricultural Input Markets in Zambia*.
P-37 *Subvention des intrants et développement de l'agriculture – Questions et options pour les économies des pays en développement et en transition* (French version of P-29 – *Input Subsidies and Agricultural Development: Issues and Options for Developing and Transitional Economies*).
R-15 *Fertilizer Dealer Handbook: Products, Storage, and Handling*.
S-28 *IFDC Corporate Report 2004/2005*.
T-71 *Development and Dissemination of Sustainable Integrated Soil Fertility Management Practices for Smallholder Farmers in Sub-Saharan Africa*.
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Financial Highlights

The following is a summary of financial information for the year ended December 31, 2005. The full financial statements and the independent auditors' reports are available from IFDC upon request.

Balance Sheet

For the year ended December 31, 2005

	US $'000
Assets:	
Cash and cash equivalents	4,423
Restricted cash	3,824
Contributions receivable	914
Contracts receivable, net of allowance for doubtful accounts	3,364
Other receivables	257
Supplies inventory	110
Prepaid expenses	139
Total current assets	13,031
Buildings and equipment, net	591
Contributions receivable, noncurrent	
Total assets	13,622
Liability and Net Assets:	
Accounts payable	2,435
Accrued annual and sick leave	705
Deferred revenue	3,994
Other liabilities	3,956
Total current liabilities	11,090
Unrestricted net assets	2,524
Permanently restricted net assets	8
Total liabilities and net assets	13,622

Statement of Revenue and Expenses

For the year ended December 31, 2005

	US $'000
Revenue and Support:	
Chemonics International Inc.	1,445
Department for International Development	2,707
Indian Farmers Fertiliser Cooperative Ltd.	318
International Fertilizer Industry Association	216
International Fund for Agricultural Development	788
National Cooperative Business Association	327
Netherlands Minister for Development Cooperation (DGIS)	2,849
The Fertilizer Institute	128
U.S. Agency for International Development	28,782
U.S. Department of Agriculture	304
Winrock International	310
Training Programs	184
Others	2,148
Total revenues and support	40,506
Expenses:	
Field programs	7,623
Research	2,710
Market development	27,959
Support activities	2,681
Total expenses	40,973
Decrease in unrestricted net assets	**(467)**

Revenue Sources
(as of June 30, 2006)

Abonos Colombianos, S.A. (ABOCOL)
African Development Bank (AfDB)
Agriterra
Applied Research Associates, Inc. (ARA)
Arab Fertilizer Association (AFA)
CARE International
International Maize and Wheat Improvement Center (CIMMYT)
Chemical Biosolids, LLC
Chemical Industries of Senegal (ICS)
Chemonics International Inc.
Cornell University
Department for International Development (DFID)
Dutch Foundation for Scientific Research in the Tropics (WOTRO)
El Dorado Chemical Company
Forum for Agricultural Research in Africa (FARA) – Sub-Sahara Africa Challenge Program
Georgia Pacific Resins Inc.
Global Environmental Facility
Government of Burkina Faso
Indian Farmers' Fertiliser Cooperative Ltd. (IFFCO)
Indo-Jordan Chemicals Company Ltd.
Institute of International Education (IIE)
International Atomic Energy Agency (IAEA)
International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
International Fertilizer Industry Association (IFA)
International Fund for Agricultural Development (IFAD)
National Cooperative Business Association (NCBA)
Nagarjuna Fertilizers and Chemicals Limited
Netherlands Ministry for Development Cooperation (DGIS)
Notore Chemical Industries
Petroquimica de Venezuela S.A. (PEQUIVEN)
Rockefeller Foundation
Sasakawa-Global 2000
Shell Canada Limited
Swiss Cooperation Bureau (Burkina Faso)
Syngenta Agro AG
Tata Chemicals Limited
The Fertilizer Institute (TFI)
United States Agency for International Development (USAID)
United States Department of Agriculture (USDA)
University of Georgia
U.S. Borax, Inc.
Winrock International

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4. On extended leave.
5. Deceased, 2005/06.
6. Student Attachment.

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IFDC Profile

What Is IFDC?

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

Mission

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

Staff and Facilities

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

Capabilities

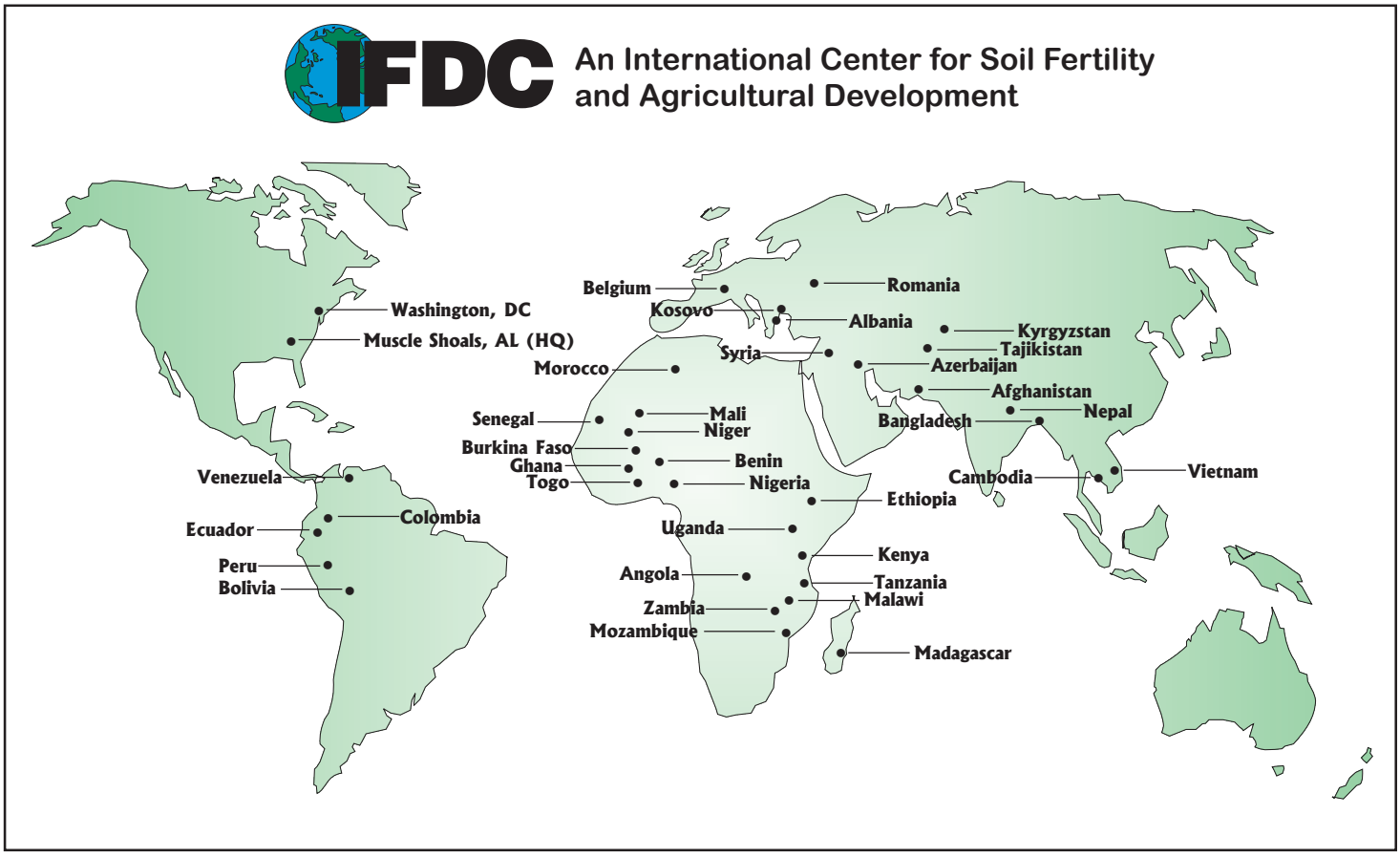
- A problem-solving, results-oriented organization with a 30+-year track record of providing a broad range of services in technical assistance, research, and training to more than 130 countries.
- Broad range of projects.
  - → Engineering and technology
  - → Management information systems
  - → Nutrient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

Locations and Funding

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

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

- 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



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