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International Fertilizer Development Center

"The Impact of IFDC's Interventions: The View From Our Partners' Perspectives"

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A woman farmer transports yams to sell in the Aképé market in Togo.

Photo by Issaka Sanlamboulga, Flash Ivoire

Acronyms

AAATA ..... Assistance to Albanian Agricultural Trade Associations
AAEF ..... Albanian American Enterprise Fund
ACFD .... African Centre for Fertilizer Development
AFADA ..... Albanian Fertilizer and Agricultural Inputs Dealers' Assocation
AFTMIN ..... African Fertilizer Trade and Marketing Information Network
ASEAN ..... Association of Southeast Asian Nations
ATDP ..... Agrobased Industries and Technology Development Project
BARC ... Bangladesh Agricultural Research Council
BATF ..... Bureau of Alcohol, Tobacco, and Firearms
BMZ ..... Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung
BRAC ..... Bangladesh Rural Advancement Committee
CGIAR ..... Consultative Group on International Agricultural Research
CIAT ..... Centro Internacional de Agricultura Tropical
CIDA ..... Canadian International Development Agency
CIMMYT ..... Centro Internacional de Mejoramiento de Maiz y Trigo
CIP ..... Centro Internacional de la Papa
CNFA ..... Citizens' Network for Foreign Affairs
DSS ..... Decision Support System
DSSAT ..... Decision Support System for Agrotechnology Transfer
EACP ..... East African Cereals Project
EMBRAPA ..... Empresa Brasileira de Pesquisa Agropecuaria
EPHTA ..... Ecoregional Program for the Humid and Subhumid Tropics of Sub-Saharan Africa
FERPHOS ..... Entreprise Nationale de Fer et du Phosphate – Algeria
GATT ..... General Agreement on Trade and Tariffs
GDP ..... gross domestic product
GIS ..... Geographic Information System
GNP ..... gross national product
IAEA ..... International Atomic Energy Agency
IAPAR ..... Instituto Agronomico de Parana
IARCs .... international agricultural research centers
ICASA ..... International Consortium for the Application of Systems Approaches to Agriculture
ICRISAT ..... International Crops Research Institute for the Semi-Arid Tropics
IDSS ..... Information and Decision Support System
IFA ..... International Fertilizer Industry Association
IFAD ..... International Fund for Agricultural Development
IFPRI ..... International Food Policy Research Institute
IITA ..... International Institute for Tropical Agriculture
IMC ..... International Minerals Corporation
INIA (Peru) ..... National Agricultural Research Institute
INIA (Uruguay) ..... National Agricultural Research Institute
INRAN ..... Institut National de Recherches Agronomiques du Niger
ISNAR ..... International Service for National Agricultural Research
ISO ..... International Standards Organization
JICA ..... Japan International Cooperation Agency
MONOMEROS ..... Monómeros Colombo Venezolanos, S.A.
NARS ..... national agricultural research systems
NOAA ..... National Oceanic and Atmospheric Agency
PBP ..... Pengedar Bahan Pertanian Sds. Bhd.
PDVSA ..... Petróleos de Venezuela, S.A.
PEQUIVEN ..... Petroquimica de Venezuela, S.A.
SDC ..... Swiss Agency for Development and Cooperation
SWNM ..... Soil, Water, and Nutrient Management
TFI ..... The Fertilizer Institute
TSBF ..... Tropical Soil Biology and Fertility Programme
UNF ..... Fertilizer Business Unit (PEQUIVEN)
USAID ..... United States Agency for International Development
USG ..... urea supergranules

The Impact of IFDC's Interventions: The View From Our Partners' Perspectives

Letter From the Chairman of the Board

"IFDC has a unique capability to make things happen around the world by approaching tasks in a holistic and multidisciplinary way, engaging partners, stakeholders, and sometimes the public, to participate actively in the process of achieving desired goals." This was one of the conclusions reached by the members of the external team selected by the U. S. Agency for International Development (USAID) to review IFDC's programs and management.

The team considered the institution to be unique for several reasons, including its broad-based holistic approach to problems, which is interdisciplinary, participatory, demand driven and results oriented. IFDC's leading global role in information management and modeling research to improve decision making attracted the team's attention.

These Peruvian youngsters take a horseback ride near Cajamarca. Hopefully these young people will someday benefit from innovative agricultural research currently underway in their country.

Photo by Dr. Walter Bowen

The external review team further found that "IFDC is the only nonprofit, international organization that can mobilize the whole range of fertilizer, agronomic, and agribusiness knowledge and experience to achieve its goals. Its activities span from the characterization of raw materials to the manufacture of fertilizers, to problems and issues of nutrient management for crop production and soil fertility, and finally, environmental protection."

IFDC was found to be uniquely qualified and positioned to conduct research and development; the Center's development component works with the ultimate users or beneficiaries of IFDC's knowledge and technology. As a result, IFDC is able to deliver tailor-made research, recommendations, and assistance to its stakeholders and clients.

On a personal note, I have been actively involved in the review of many international agriculture research centers and have found the recent review of IFDC perhaps the most positive of any that I have had the privilege of participating in.

IFDC can play a more vital role in the future when we consider that the United Nations predicts the world's population will reach 7.7 billion in 2020, an increase of 35% over the 1995 population of 5.7 billion. More than 95% of this increase will occur in the developing countries, which will be home to 84% of humanity in 2020. As a result, the food gap is likely to more than double for the developing countries by 2020. Millions of poor people may not be able to afford the food they need, even if the supply is sufficient.

If improved long-term productivity on small farms in low-income developing countries is the key to reduced poverty, improved food security, and sound management of natural resources over the next few decades, then obviously, increased use of plant nutrients—both organic and mineral—is an important part of the future picture. Fertilizer will continue to be a cornerstone of agriculture required to feed the growing world population. Fertilizers replenish the nutrient supply that is removed from the soils by harvested crops; they encourage the adoption of high-yielding crop varieties and increase the biomass in the nutrient-deficient soils of the tropics and subtropics. The availability of sufficient plant nutrients in the soil is a critical determinant of crop yields. Therefore, it is crucial that fertilizer use be expanded in these food-insecure countries.

IFDC will remain a viable, dynamic, and necessary organization as we move into the new millennium, which will undoubtedly present a different set of challenges as we pursue the quest of food security in the developing world.

E. Travis York
Chairman
IFDC Board of Directors

El Impacto de las Intervenciones del IFDC: El Punto de Vista a Partir de la Perspectiva de Nuestros Socios

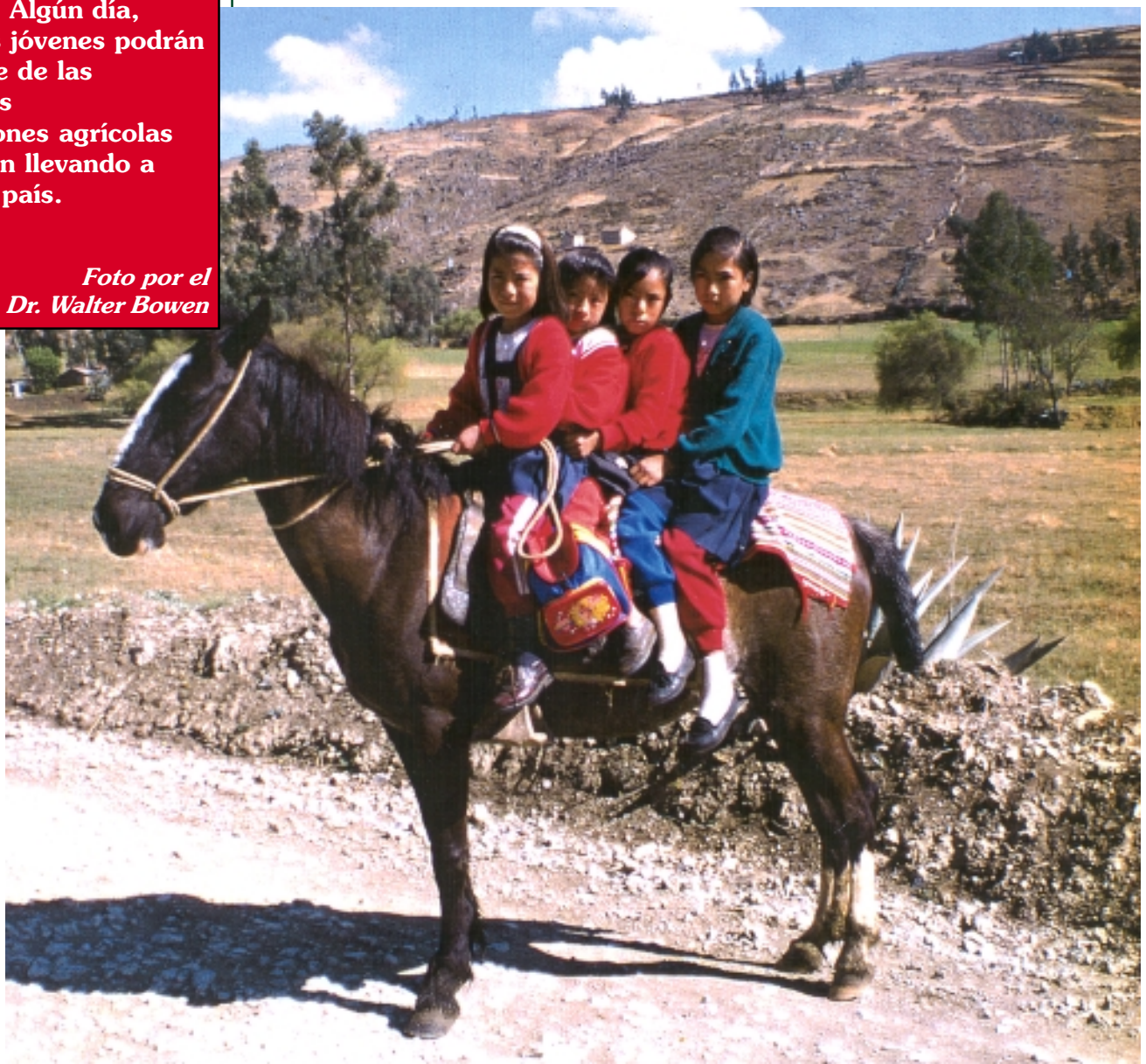
Carta del Presidente de la Junta Directiva

"El IFDC tiene una capacidad única para alcanzar logros alrededor del mundo al acometer los trabajos en forma holística y multidisciplinaria, estimulando a los socios, personas interesadas y a veces el público, a participar activamente en el proceso de alcanzar las metas deseadas." Esta fue una de las conclusiones a la cual llegó uno de los miembros del equipo externo seleccionado por la Agencia Estadounidense para el Desarrollo Internacional (USAID) para que revisara los programas y el manejo del IFDC.

El equipo consideró que la institución es única por varias razones, incluyendo su enfoque amplio y holístico hacia los problemas, el cual es interdisciplinario, participatorio, generado por demanda y orientado hacia los resultados. El papel que desempeña el IFDC de

Estos niños peruanos montan a caballo cerca de Cajamarca. Algún día, ojalá, estos jóvenes podrán beneficiarse de las innovadoras investigaciones agrícolas que se están llevando a cabo en su país.

Foto por el Dr. Walter Bowen



líder global en el manejo de información y modelaje de investigaciones para mejorar la toma de decisiones le llamó la atención al equipo.

El equipo de revisión externa encontró además que "el IFDC es la única organización internacional sin ánimo de lucro que es capaz de mobilizar toda la gama de conocimientos sobre fertilizantes, tanto agronómicos como de agrinegocios más su experiencia para lograr sus metas. Sus actividades van desde la caracterización de materias primas hasta la manufactura de fertilizantes, a problemas y factores en el manejo de nutrientes para la producción de cosechas y fertilidad de suelos, y finalmente, a la protección ambiental."

Se encontró que el IFDC estaba especialmente calificado y en posición para llevar a cabo investigaciones y desarrollo; el componente de desarrollo del Centro trabaja con las personas que usan los conocimientos y tecnología del IFDC o sus beneficiarios. Como resultado, el IFDC tiene la capacidad de proporcionar investigaciones, recomendaciones y asistencia a las personas interesadas y sus clientes diseñadas específicamente para ellos.

Comentando personalmente, yo he estado activamente vinculado a las revisiones de muchos centros internacionales de investigación agrícola y encuentro que la reciente revisión del IFDC es tal vez la más positiva en las cuales yo he tenido el placer de participar.

El IFDC puede jugar un papel más vital en el futuro cuando consideramos que las Naciones Unidas predice que la población del mundo llegará a los 7.7 mil millones en 2020, un aumento del 35% por encima de la población en 1995 de 5.7 mil millones. Más del 95% de este aumento ocurrirá en los países en desarrollo, lo cual será el lugar de origen del 84% de la humanidad en 2020. Como resultado, la brecha en la falta de alimentos será mayor del doble para los países en desarrollo en 2020. Millones de personas con escasos recursos podrán no ser capaces de pagar los alimentos que necesiten aún si el suministro de alimentos es suficiente.

Si la productividad a largo plazo en las pequeñas granjas de bajos ingresos en los países en desarrollo es la llave para reducir la pobreza, mejorar la seguridad de alimentos, y el manejo correcto de los recursos naturales en las próximas décadas, entonces, obviamente, el aumento en el uso de nutrientes de plantas—tanto orgánicos como minerales—es una parte importante del cuadro futuro. Los fertilizantes continuarán siendo la clave de la agricultura requerida para alimentar la creciente población global. Los fertilizantes reponen el suministro de nutrientes que es removido de los suelos por las cosechas cultivadas; éstos estimulan la adopción de variedades de cultivos con altos rendimientos y aumentan la biomasa en los suelos deficientes en nutrientes de los trópicos y subtrópicos. La disponibilidad de suficientes nutrientes de planta en el suelo es un determinante crítico para los rendimientos de cosechas. Por lo tanto, es crucial que el uso de fertilizantes sea expandido en estos países que sufren de inseguridad de alimentos.

El IFDC permanecerá siendo una organización viable, dinámica y necesaria a medida que gravitamos hacia el nuevo milenio, el cual indudablemente presentará una nueva serie de retos a medida que seguimos en la búsqueda de la seguridad de alimentos en el mundo en vías de desarrollo.

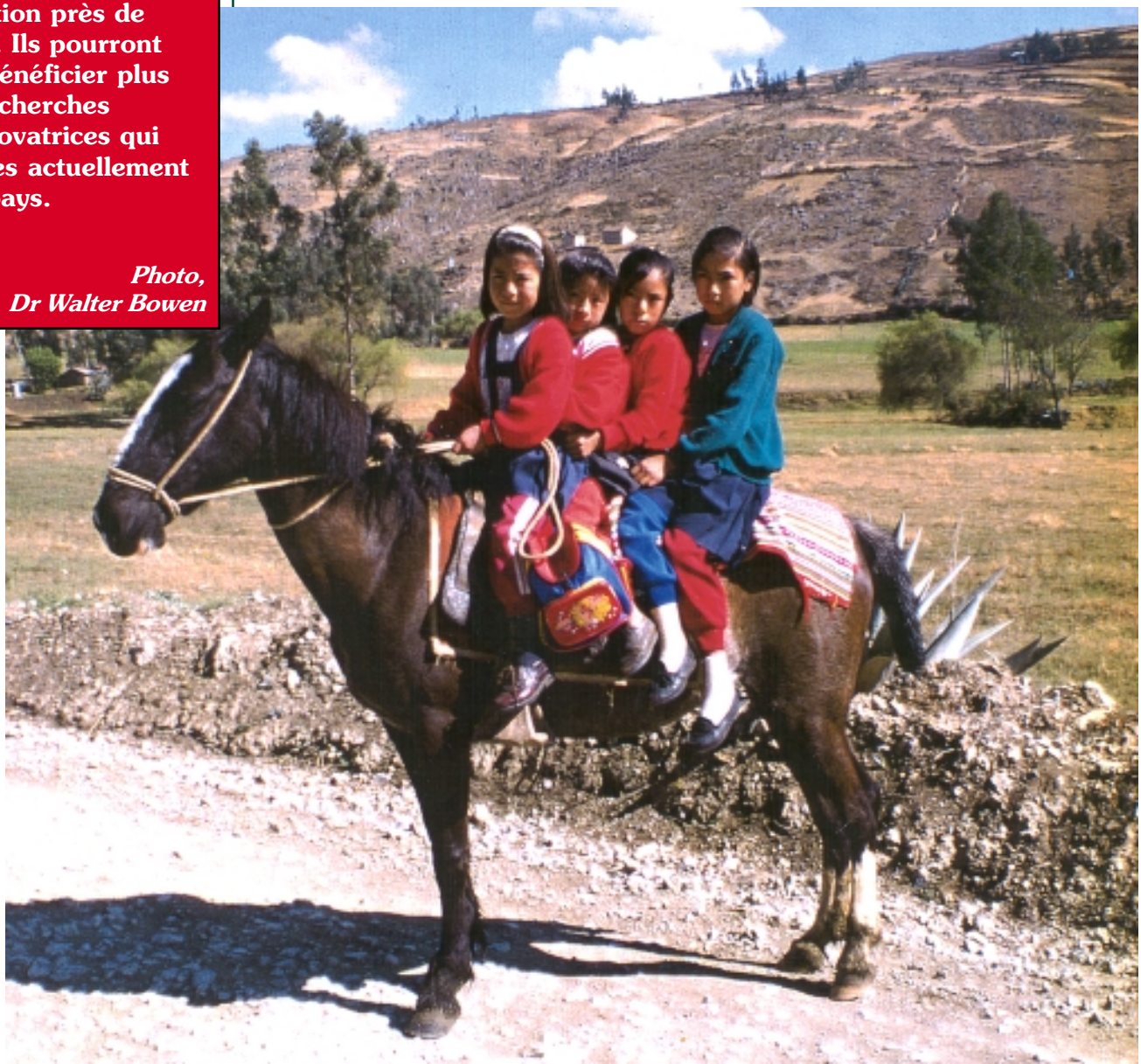
E. Travis York
Presidente
Junta Directiva del IFDC

L'Impact des interventions de l'IFDC: le point de vue de nos partenaires

Lettre du Président du Conseil d'Administration

"L'IFDC a la capacité exceptionnelle de faire avancer les choses dans le monde en abordant les tâches de façon holistique et pluridisciplinaire, engageant les partenaires, les acteurs et parfois le public à collaborer activement à la réalisation des objectifs définis." C'est une des conclusions auxquelles sont parvenus les membres de la mission externe désignée par l'Agence de développement international des Etats-Unis (USAID) pour évaluer les programmes et la gestion de l'IFDC.

Selon l'équipe chargée de cette mission, le caractère exceptionnel du Centre tient à plusieurs raisons dont son approche holistique des problèmes, approche également interdisciplinaire, participative, axée sur la demande et exigeante en résultats. Le rôle mondial de premier



Ces jeunes péruviens font de l'équitation près de Cajamarca. Ils pourront peut-être bénéficier plus tard des recherches agricoles novatrices qui sont menées actuellement dans leur pays.

Photo, Dr Walter Bowen

plan qu'exerce l'IFDC dans les domaines de la gestion de l'information et de la recherche en modélisation pour améliorer la prise de décision a particulièrement retenu leur attention.

L'équipe a en outre réalisé que "l'IFDC était la seule organisation internationale à but non lucratif capable de mobiliser toute une gamme de connaissances et d'expériences en matière d'engrais, d'agronomie et d'agro-industrie pour atteindre ses objectifs. Les activités de l'organisation vont de la caractérisation des matières premières à la fabrication des engrais, en passant par la gestion des éléments nutritifs pour la production agricole et la fertilité des sols et enfin, à la protection de l'environnement."

L'IFDC a été jugé exceptionnellement qualifié et bien positionné pour mener des activités de recherche et de développement. Le volet développement du Centre est exécuté avec la participation des utilisateurs ou des bénéficiaires des connaissances et technologies mises au point par l'IFDC. Par conséquent, l'IFDC a la capacité d'effectuer des recherches et de fournir des recommandations et de l'appui sur mesure à ses clients et à ses partenaires.

J'ai personnellement pris une part active à l'évaluation de plusieurs centres internationaux de recherche agricole et, selon moi, l'évaluation récente de l'IFDC est peut-être la plus positive de toutes celles auxquelles j'ai eu le privilège de participer.

L'IFDC peut jouer un rôle plus décisif dans l'avenir, puisque l'Organisation des Nations Unies prévoit que la population mondiale atteindra le chiffre de 7,7 milliards en l'an 2020, ce qui marquera une augmentation de 35 pour cent par rapport à la population de 1995 qui était de 5,7 milliards. Plus de 95 pour cent de cette augmentation aura lieu dans les pays en voie de développement qui supporteront 84 pour cent de l'humanité en 2020. Par conséquent, le déficit alimentaire risque de doubler dans ces pays autour de cette période. Des millions de personnes défavorisées risquent de ne pas pouvoir se procurer les vivres dont ils auront besoin, même avec une offre alimentaire suffisante.

Si l'amélioration à long terme de la productivité sur les petites exploitations des pays en développement à faible revenu est le principal moyen de réduire la pauvreté, de renforcer la sécurité alimentaire et de gérer judicieusement les ressources naturelles pendant les prochaines décennies, alors manifestement, l'utilisation accrue des éléments nutritifs–tant organiques que minéraux—constitue un élément important du tableau de l'avenir. L'engrais continuera d'être une pierre angulaire de l'agriculture qu'il faut pour nourrir la population mondiale croissante. Les engrais réapprovisionnent les sols en éléments nutritifs exportés par les récoltes ; ils favorisent l'adoption des variétés à haut rendement et augmentent la biomasse dans les sols déficitaires en éléments nutritifs des régions tropicales et sub-tropicales. La disponibilité dans le sol d'éléments nutritifs en quantité suffisante est un déterminant capital du rendement des cultures. Il est donc crucial d'accroître l'utilisation des engrais dans les pays où sévit l'insécurité alimentaire.

L'IFDC restera une organisation viable, dynamique et nécessaire en franchissant le seuil du nouveau millénaire qui présentera sans aucun doute une nouvelle série de défis, à mesure que nous poursuivons la quête de la sécurité alimentaire dans le monde en développement.

E. Travis York
Président du Conseil
d'Administration de l'IFDC

The Impact of IFDC's Interventions: The View From Our Partners' Perspectives

Message From the President and Chief Executive Officer

As IFDC nears the quarter century mark, we are meeting new and varied challenges in the developing countries and the transitional economies of Eastern Europe and Eurasia. Established in the early 1970s, IFDC ultimately works to promote food security, poverty alleviation, and the sound management of natural resources throughout the developing world. IFDC pursues its objectives through diverse activities carried out with the cooperation of a network of partners including national and international organizations, the public and private sector, scientists, farmers, entrepreneurs, and others.

During 1998 IFDC tackled a myriad of challenges involving market development, natural resources management and environmental protection, management information systems, production technology assistance, and human capacity building. In Albania our project opened doors for many of that country's entrepreneurs, despite a troubling period of unrest. In Bangladesh a unique partnership of public, private, nongovernmental, and international donor organizations increased productive employment

Women near the Gulf of Guinea prepare cassava to make "gari," a basic component of the staple diet in Togo.

Photo by Issaka Sanlamboulga, Flash Ivoire

in agriculture and related business sectors, promoted policy reforms, and helped to increase food security for the poor. In Latin America our scientists stationed there worked with a wide range of partners to create information and decision support systems to aid agriculture-sector decision makers in making recommendations for optimal input use, crop yield forecasts, drought alerts, and evaluations of the sustainability of production systems. In Africa our scientists sought to provide answers to the problems faced by farmers trapped in a seemingly endless cycle of low income, low inputs, and low yields.

To position itself for the new millennium, IFDC recently completed an exercise in strategic planning. According to the new strategic plan, entitled "Managing Plant Nutrients for a Sustainable Agriculture," the goal of IFDC is to contribute to food security, environmental protection, and the sustainable economic progress and well being of people in the developing countries and transitional economies through the development and transfer of information and technology regarding plant nutrients.

IFDC will concentrate on four strategies and four cross-cutting support functions to produce the outputs and outcomes that are necessary for the Center to achieve its goal as a member of the family of institutions contributing to international economic, social, and environmentally sustainable development. The goals involve developing competitive markets for agricultural inputs and outputs; providing tools for more effective management of plant nutrients and the environment; developing and transferring sets of integrated practices to improve and sustain soil fertility, particularly in Africa; and transferring technologies and practices to enhance the efficiency of plant nutrient production and supply. The cross-cutting functions include human resource development through training; policy analysis and reform; institutional capacity building; and tools for information management and decision support.

As we near the new millennium agriculture remains the cornerstone of development in poor countries since more than 70% of their people depend on the land for their livelihoods. IFDC is sufficiently capable, flexible, well trusted and well positioned to help provide the answers to the agricultural-related challenges of the 21st century.

Amit H. Roy
IFDC President and
Chief Executive Officer

El Impacto de las Intervenciones del IFDC: El Punto de Vista a Partir de la Perspectiva de Nuestros Socios

Mensaje del Presidente y Jefe Ejecutivo

A medida que el IFDC se acerca a cumplir un cuarto de siglo de fundado, estamos encontrando nuevos y variados retos en los países en desarrollo y las economías en transición de Europa Oriental y Eurasia. Establecido a comienzos de los años 1970, el IFDC primordialmente trabaja para promover la seguridad de alimentos, aliviar la pobreza y el manejo correcto de los recursos naturales a través del mundo en vías de desarrollo. El IFDC logra sus objetivos a través de diversas actividades que se llevan a cabo con la cooperación de una red de socios incluyendo organizaciones nacionales e internacionales, los sectores públicos y privados, científicos, agricultores, empresarios y demás.

Durante 1998 el IFDC afrontó una cantidad de retos que incluyeron el desarrollo de mercados, manejo de recursos naturales y protección ambiental, sistemas de manejo de información, asistencia en la tecnología de producción y desarrollo de recursos humanos. En Albania nuestro proyecto abrió puertas para muchos de los empresarios en ese país, a pesar de haber vivido un período difícil de inestabilidad social. En Bangladesh una asociación única entre

Mujeres cerca del Golfo de Guinea preparan yuca para hacer "gari," un componente basico de la dieta diaria en Togo.

Foto por Issaka Sanlamboulga, Flash Ivoire

organizaciones públicas, privadas, no gubernamentales y donantes internacionales aumentaron el empleo productivo en la agricultura y sectores de negocios relacionados, promovieron la reforma de políticas y aumentaron la seguridad de alimentos para los pobres. En latinoamérica nuestros científicos asignados allá trabajaron con una gran cantidad de diversos socios para crear información y sistemas de apoyo para la toma de decisiones con el fín de prestar asistencia a las personas en el sector agrícola con poder decisorio para que éstos hagan recomendaciones sobre el uso óptimo de insumos, pronósticos de rendimientos de cosechas, alertas de sequía y evaluaciones sobre la sostenibilidad de los sistemas de producción. En el Africa nuestros científicos trabajaron para dar respuestas a los problemas que afrontan los agricultores atrapados en el aparentemente interminable ciclo de bajos recursos, bajos insumos y bajos rendimientos.

Con el fín de prepararse para el nuevo milenio, el IFDC recientemente completó un ejercicio de planeación estratégica. De acuerdo al nuevo plan estratégico titulado "Manejando Nutrientes de Planta para una Agricultura Sostenible," la meta del IFDC es contribuír a la seguridad de alimentos, la protección ambiental, el progreso económico sostenible y el bienestar de las gentes en los países en desarrollo y economías en transición a través del desarrollo y transferencia de información y tecnología pertinentes a los nutrientes de planta.

El IFDC se concentrará en cuatro estrategias y cuatro funciones de apoyo de gran alcance que producirán los productos y resultados que son necesarios para que el Centro logre su meta como miembro de la familia de las instituciones que contribuyen al desarrollo económico internacional, social y ambientalmente sostenible. Las metas incluyen desarrollar mercados competitivos para los insumos y productos agrícolas; proveer las herramientas para el manejo más efectivo de nutrientes de plantas y el medio ambiente; desarrollar y transferir una serie de prácticas integradas para mejorar y sostener la fertilidad de suelos, particularmente en el Africa; y transferir tecnologías y prácticas para mejorar la eficiencia de la producción y suministro de nutrientes de planta. Las funciones de gran alcance incluyen el desarrollo de recursos humanos a través de entrenamientos, análisis de políticas y reforma; desarrollo de capacidad institucional; y herramientas para el manejo de información y apoyo para la toma de decisiones.

A medida que nos aproximamos al nuevo milenio la agricultura sigue siendo la clave para el desarrollo en los países pobres ya que más del 70% de su gente depende de la tierra para su sustento. El IFDC es suficientemente capaz, flexible, goza de alta reputación y está bien preparado para ayudar a proveer las respuestas de los retos relacionados a la agricultura en el siglo 21.

Amit H. Roy
Presidente IFDC
y Jefe Ejecutivo

L'Impact des interventions de l'IFDC: le point de vue de nos partenaires

Message du Président-Directeur Général

En approchant la fin du dernier quart du siècle, l'IFDC fait face à de nouveaux défis dans les pays en développement et les nouvelles démocracies de l'Europe de l'Est et de l'Eurasie. Créé au début des années soixante-dix, l'IFDC oeuvre dans le but ultime de promouvoir la sécurité alimentaire, la réduction de la pauvreté et la gestion judicieuse des ressources naturelles dans l'ensemble du monde en développement. L'IFDC poursuit ses objectifs à travers diverses activités menées avec la coopération d'un réseau de partenaires dont les organisations nationales et internationales, le secteur public et le secteur privé, les scientifiques, les agriculteurs, les entrepreneurs et autres.

Au cours de l'année 1998, l'IFDC s'est attaqué à une multitude de défis dont le développement de marché, la gestion des ressources naturelles, la protection de l'environnement, la gestion des systèmes d'information, l'appui à la technologie de production, et le développement des capacités humaines. En Albanie, notre projet a ouvert des portes à de nombreux entrepreneurs locaux malgré une période de troubles. Au Bangladesh, grâce à un partenariat

Des femmes préparent le manioc pour la fabrication du "gari" une composante essentielle de l'alimentation de base au Togo et dans d'autres pays du Golfe de Guinée.

Photo, Issaka Sanlamboulga, Flash Ivoire

exemplaire avec des organisations publiques, privées, non gouvernementales et internationales, l'IFDC a aidé à accroître les emplois productifs en agriculture et les secteurs connexes, à promouvoir des réformes de politique et à renforcer la sécurité alimentaire pour les populations pauvres. En Amérique latine, nos chercheurs ont collaboré avec un large éventail de partenaires à la création des systèmes d'aide à la décision pour guider les décideurs du secteur agricole dans l'élaboration, des recommandations pour l'utilisation optimale des intrants, les prévisions des rendements agricoles, les alertes à la sécheresse et l'évaluation de la durabilité des systèmes de production. En Afrique, nos chercheurs ont essayé d'apporter des réponses aux problèmes auxquels sont confrontés les agriculteurs qui sont pris dans le cycle apparemment interminable de faibles revenus – faibles apports d'intrants – faibles rendements.

Afin de se positionner pour le nouveau millénaire, l'IFDC a procédé récemment à un exercice de planification stratégique. Selon le nouveau plan stratégique intitulé "Gestion des éléments nutritifs des plantes pour une agriculture durable," l'objectif de l'IFDC est de contribuer à la sécurité alimentaire, à la protection de l'environnement, au progrès économique durable et au bien-être des peuples des pays en développement et des économies transitionnelles par l'élaboration et le transfert d'informations et de technologies relatives aux éléments nutritifs des plantes.

L'IFDC concentrera son attention sur quatre stratégies avec quatre fonctions d'appui afin d'obtenir les produits et les résultats nécessaires pour réaliser ses objectifs comme membre de la famille des institutions contribuant à un développement international durable sur le plan économique, social et environnemental. Ces objectifs impliquent le développement de marchés compétitifs pour les intrants et les produits agricoles, la fourniture d'outils pour une gestion plus efficace des éléments nutritifs des plantes et de l'environnement, la mise au point et le transfert de paquets de techniques intégrées pour l'amélioration et le maintien de la fertilité des sols, particulièrement en Afrique et le transfert des technologies et des pratiques susceptibles d'améliorer l'efficacité de la production et de l'approvisionnement en éléments nutritifs. Les fonctions d'appui qui sont de nature transversale comprennent le développement des ressources humaines par la formation, l'analyse et les réformes de politique, le renforcement des capacités institutionnelles et la mise au point d'outils de gestion de l'information et d'aide à la décision.

A l'approche du nouveau millénaire, l'agriculture reste la pierre angulaire du développement des pays défavorisés puisque 70 pour cent de leurs populations tirent leur subsistance de la terre. L'IFDC est suffisamment capable, flexible, crédible et bien positionné pour aider à trouver des réponses aux défis que pose l'agriculture du 21ème siècle.

Amit H. Roy
Président-Directeur
Général de l'IFDC

IFDC Profile

IFDC is a public, nonprofit, international organization dedicated to conduct its work independently and on a scientifically sound basis. IFDC was founded in 1974 to help in the quest for global food security. The Center's goal is increasing agricultural productivity in a sustainable manner through the development and transfer of effective, environmentally sound plant nutrient technology and agricultural marketing expertise. The Center has conducted technology transfer activities in more than 120 countries. IFDC has contributed to the development of human resources and institutional capacity building in 150 countries through some 600 training programs. Its cadre of scientists and professionals provide a unique mix of applied research and technology transfer capabilities. The Center's facilities include libraries, laboratories, greenhouses, pilot plant, training facilities, and field stations in Africa.

A Togolese farmer and her son prepare to sell the fruits (plantain) of their labor.

Photo by Issaka Sanlamboulga, Flash Ivoire

IFDC's work focuses on:

- Policy analyses and reform and institutional capacity building to develop competitive markets for agricultural inputs and outputs;
- Provision of tools and information for more efficient and environmentally sound management of plant nutrients;
- Information and recommendations to improve and sustain soil fertility and land productivity, particularly in Africa;
- Provision of technical assistance and knowledge to enhance the efficiency and safety of plant nutrient production and supply;
- Training for human resource development in all areas of work.

IFDC's organizational structure is comprised of the following four operating divisions:

1. Research and Development; this division conducts strategic and applied research and training in nutrient management and soil fertility;
2. Outreach; this division concentrates on technical assistance and technology transfer and training to improve efficiency of the fertilizer and agriculture sectors;
3. IFDC-Africa, located at Lomé, Togo; this division addresses the constraints to improving soil fertility and agricultural productivity of countries in Africa, particularly those in the western region;
4. IFDC-Asia located in Dhaka, Bangladesh; this division is in a nascent stage of development and will concentrate on improving input and output marketing in the South and Southeast Asian countries.

In addition to these divisions, the Human Resources Development Unit coordinates global training programs and workshops. The Financial, Administration, and Support Services Unit (FASSU) coordinates all of the accounting, purchasing, word processing, graphics, and library services for IFDC.

IFDC has offices and staff stationed in Albania, Bangladesh, Kenya, Niger, Peru, Togo, Ukraine, Uruguay, Venezuela, and Washington, DC. The Center collaborates with the international agricultural research centers (IARCs), numerous national organizations, private-sector and nongovernmental organizations around the world. Partners and clients are diverse and include bilateral and multilateral development agencies, host-government institutions and private enterprises. Much of the Center's revenue is generated from long-term, donor-funded, market development projects through which its staff members transfer policy and technology improvements in emerging economies.

Vision

The vision of IFDC focuses on contributing significantly to food security and economic progress by promoting sustainable agricultural development across the world through the efficient and environmentally sound management of plant nutrients in conjunction with other agricultural inputs and natural resources.

Mission Statement

To facilitate the sustainable improvement of agricultural productivity through the development and transfer of effective and environmentally sound plant-nutrient technology and agricultural marketing expertise.

Perfil del IFDC

El IFDC es una organización internacional, pública, sin ánimo de lucro dedicada a llevar a cabo su trabajo independientemente y con bases científicamente correctas. El IFDC fue fundado en 1974 para ayudar en la búsqueda de la seguridad mundial de alimentos. La meta del Centro es el aumentar la producción agrícola y la experticia del mercadeo agrícola en una forma sostenible a través del desarrollo y transferencia de la tecnología de nutrientes de plantas ambientalmente correcta. El Centro ha llevado a cabo actividades en la transferencia de tecnología en más de 120 países. El IFDC ha contribuído al desarrollo de recursos humanos y al aumento de la capacitación institucional en 150 países a través de aproximadamente 600 programas de entrenamiento. Su grupo de científicos y profesionales presentan un compuesto sin igual de posibilidades en la investigación aplicada y la transferencia de tecnología. Las instalaciones del Centro incluyen bibliotecas, laboratorios, invernaderos, plantas piloto, instalaciones para entrenamiento y estaciones de campo en el Africa.

Una agricultora togolés y su hijo se preparan para vender los frutos (plátanos) de su trabajo.

Foto por Issaka Sanlamboulga, Flash Ivoire

La labor del IFDC hace enfoque sobre:

- Los análisis de políticas y reformas y el aumento de la capacitación institucional con el fín de desarrollar mercados competitivos para los insumos y rendimientos agrícolas;
- La provisión de herramientas e información para el manejo de nutrientes de planta en forma más eficiente y ambientalmente correcta;
- Información y recomendaciones para mejorar y sostener la fertilidad de suelos y la productividad de tierras, particularmente en el Africa;

- La provisión de asistencia técnica y conocimientos para aumentar la eficiencia y seguridad de la producción y suministro de nutrientes de plantas;
- Entrenamientos para el desarrollo de recursos humanos en todas las áreas de trabajo.

El cuadro organizativo del IFDC comprende de cuatro divisiones de operación.

1. Investigación y Desarrollo; esta división lleva a cabo investigaciones estratégicas y aplicadas y entrenamientos sobre el manejo de nutrientes y fertilidad de suelos;
2. Extensión; esta división se concentra en la asistencia técnica y la transferencia de tecnología y entrenamiento para mejorar la eficiencia de los sectores de fertilizantes y agricultura;
3. IFDC-Africa situado en Lomé, Togo; esta división labora contra los impedimentos al mejoramiento de la fertilidad de suelos y la productividad agrícola en los países del Africa, particularmente aquellos en la región occidental;
4. IFDC-Asia situado en Dhaka, Bangladesh; esta división se encuentra en una etapa de desarrollo naciente y se concentrará en mejorar el mercadeo de insumos y productos en los países del sur y sureste asiático.

Además de estas divisiones, la Unidad de Desarrollo de Recursos Humanos coordina programas globales de entrenamiento y talleres de trabajo. La Unidad de Servicios Financeros, Administración y Apoyo (FASSU) coordina toda la contabilidad, compras, procesamiento de palabras, gráficas, y servicios de biblioteca para el IFDC.

El IFDC tiene oficinas y personal asignado en Albania, Bangladesh, Burkina Faso, Kenia, Níger, Perú, Togo, Ucrania, Uruguay, Venezuela y Washington, D.C., EE.UU. El Centro colabora con los centros internacionales para la investigación agrícola (IARCs), numerosas organizaciones nacionales, el sector privado y organizaciones no gubernamentales alrededor del mundo. Sus colaboradores y clientes son diversos e incluyen a agencias de desarrollo bilaterales y multilaterales, de diversos países y la industria privada. Gran parte de las entradas financieras del Centro vienen de fondos generados por donantes para proyectos a largo plazo de desarrollo de mercado a través de los cuales sus miembros del personal transfieren mejoramientos en políticas y tecnología en las economías emergentes.

Visión

La visión del IFDC hace enfoque en contribuír significativamente a la seguridad de alimentos y el progreso económico al promover el desarrollo agrícola sostenible alrededor del mundo a través del manejo eficiente y ambientalmente correcto de los nutrientes de plantas en conjunto con otros insumos agrícolas y recursos naturales.

Declaración de Misión

Facilitar el mejoramiento sostenible de la productividad agrícola a través del desarrollo y transferencia de la tecnología efectiva y ambientalmente correcta de nutrientes de planta y la experticia del mercadeo agrícola.

Profil de l'IFDC

L'IFDC est une organisation publique, internationale, à but non lucratif qui mène son action dans un esprit d'indépendance et sur une base rigoureusement scientifique. L'objectif du Centre est de contribuer à une croissance durable de la productivité agricole par la mise au point et le transfert de technologies de fertilisation efficaces et respectueuses de l'environnement et le développement de l'expertise en commercialisation agricole. Le Centre a conduit des activités de transfert de technologie dans plus de 120 pays. Il a contribué au développement des ressources humaines et au renforcement de la capacité institutionnelle dans 150 pays par le biais de quelques 600 programmes de formation. Son cadre constitué de scientifiques et de professionnels représente un mélange exceptionnel de capacités en recherche appliquée et en transfert de technologie. Le Centre dispose d'une infrastructure comprenant des bibliothèques, des laboratoires, des serres, une usine pilote, des équipements de formation et des stations d'expérimentation au champ en Afrique.

Une agricultrice togolaise et son fils s'apprêtent à aller vendre les fruits (plantain) de leur labeur.

Photo, Issaka Sanlamboulga, Flash Ivoire

Les activités de l'IFDC sont axées sur:

- L'analyse et les réformes de politique et le renforcement de la capacité institutionnelle en vue de favoriser des marchés compétitifs pour les intrants et les produits agricoles.
- La fourniture d'outils et d'informations pour une gestion des éléments nutritifs qui soit efficace et compatible avec les impératifs environnementaux.

- La fourniture d'assistance technique et la mise à disposition des connaissances nécessaires pour améliorer l'efficacité et la sécurité au niveau de la production et de l'utilisation des éléments nutritifs des plantes.
- La formation en vue du développement des ressources humaines dans tous les domaines d'intervention.

La structure organisationnelle de l'IFDC est composée des quatre divisions suivantes:

1. Recherche et Développement ; cette division conduit des recherches stratégiques et appliquées et la formation en gestion des éléments nutritifs et fertilité des sols;
2. Services extérieurs; cette division se consacre à l'assistance technique, le transfert de technologie et la formation en vue d'améliorer l'efficacité du secteur agricole et du secteur des engrais;
3. L'IFDC-Afrique installé à Lomé, Togo; cette division s'attaque aux contraintes qui freinent l'amélioration de la fertilité des sols et de la productivité agricole dans les pays africains, particulièrement ceux de l'Afrique de l'Ouest;
4. L'IFDC-Asie installé à Dhaka, Bangladesh; cette division est en cours de structuration et sera axée sur l'amélioration de la commercialisation des intrants et des produits agricoles dans les pays de l'Asie du Sud et du Sud-Est.

L'IFDC a installé des bureaux et du personnel en divers points du globe en divers points du globe: Albanie, Bangladesh, Kenya, Niger, Pérou, Togo, Ukraine, Uruguay, Venezuela et Washington D. C. Le Centre collabore avec des organismes internationaux de recherche agricole, de nombreuses organisations nationales, ainsi que des organisations non gouvernementales dans le monde entier. Ses partenaires et clients sont multiples et variés. Ce sont des organismes bilatéraux et multilatéraux de développement, des institutions gouvernementales d'accueil et des entreprises privées. La majeure partie des revenus du Centre provient de projets de développement de marché à long terme, qui sont financés par des bailleurs de fonds. C'est au travers de ces projets que s'effectuent les activités de transfert de politique et d'amélioration des technologies dans les économies émergeantes.

Vision

La vision de l'IFDC s'inspire de la nécessité de contribuer de façon déterminante à la sécurité alimentaire et au progrès économique par la promotion du développement agricole durable dans le monde, grâce à une gestion des éléments nutritifs des plantes qui soit efficace et respectueuse de l'environnement et qui intègre d'autres intrants agricoles et ressources naturelles.

Mission

La mission de l'IFDC est de faciliter l'amélioration durable de la productivité agricole par la mise au point et le transfert de techniques de gestion des éléments nutritifs efficaces et respectueuses de l'environnement et le développement de l'expertise en commercialisation agricole.

Milestones of IFDC's Accomplishments

Introduction

In tackling some of the most important challenges confronting humanity during this decade, IFDC is having an impact around the globe – in the developing countries and the new democracies in eastern and central Europe. These challenges relate to feeding the burgeoning world population through the improvement of soil fertility, better management of nutrients, and policy reform to establish open and competitive markets and efficient economic systems.

By applying innovative agricultural technologies in an agribusiness setting, IFDC is laying the groundwork for the alleviation of poverty in countries throughout the developing world. In Albania and Bangladesh IFDC has effectively linked agricultural production with economic development through the design and implementation of economic policies that promote the free market system and lead to economic efficiency, increased employment, and overall economic growth. IFDC's work in Asia, Africa, Latin America, and the new democracies of eastern and central Europe promotes the implementation of market principles that result in increases in both agricultural production and economic development.

Market Development

- The Agrobased Industries and Technology Development Project (ATDP) in Bangladesh clearly showed the results of entrepreneurial spirit and convinced the Government and budding agribusinessmen that Bangladesh has a future in value-added

Farmers in the Tangail District of Bangladesh apply urea supergranules to their rice crops.

ATDP photos

agribusiness. The eight subsectors that are addressed by this project are fertilizer, seed and field crops, horticulture, poultry, livestock, fisheries, processing of agricultural products, agricultural machinery, and agricultural processing equipment. During 1998 more than 100,000 farmers increased their incomes by using more productive environmentally sound technologies. Ninety-seven contract grower/pilot zones were initiated with private business investments. During 1998 more than US $120 million increase in productivity resulted from investments by private businesses in the agricultural sector. The ATDP project spearheaded 35 policy reforms to facilitate agribusiness growth.

- ATDP forged ahead in technology introduction and commercialization. For example, ATDP's promotion of the technology for urea supergranule (USG) deep placement improved rice cultivation in Bangladesh. Under flooded rice cultivation this technology is more efficient and, given the availability and cost of labor in Bangladesh, it is more cost effective than traditional methods of applying urea. The increase in crop production, using less fertilizer, meant 57% higher net returns for rice farmers. The goal for 1999/2000 is to extend this technology to 100,000 ha of paddy.

- The IFDC-Albania project brought the Albanian Fertilizer and Agricultural Inputs Dealers' Association (AFADA) to self-sufficiency. In collaboration with the Albanian American Enterprise Fund (AAEF), the AFADA dealers were provided credit lines totaling US $1.85 million for fertilizer importation at a time when the state banking system had collapsed. Total annual fertilizer importation into Albania for 1998 was 83% greater than that for 1997. IFDC/Albania assisted input dealers in establishing Technology Transfer Centers and a private-sector extension service that provides 75% of the 400,000 small-holder farmers with access to more productive technologies.

- In cooperation with Sasakawa Global 2000 and USAID, IFDC staff members conducted a study that identified important constraints to the development of the fertilizer market in Mozambique and suggested policy-related and other measures to alleviate these constraints. Staff members interacted with policy makers, farmers, private-sector dealers, donors, and nongovernmental organizations, and completed the study report entitled "The Fertilizer Market in Mozambique: An Assessment and a Strategy for Long Term Development." As part of the collaboration with SG2000, a similar study was conducted in Uganda with partial financial support from USAID/Uganda.

- During 1998 USAID, recognizing the importance of the soil nutrient problem on sustainable agriculture, asked IFDC to shape a "Strategic Framework for African Agricultural Inputs Supply System Development," which addresses in practical terms how to develop private-sector agricultural input markets in sub-Saharan Africa. Followup to the preparation is the validation of the framework in a workshop setting. The strategic framework will assist stakeholders as they design interventions (policies and programs) to support or induce private sector-based action to increase access to and use of agricultural inputs.

- An IFDC agribusiness specialist stationed in the Ukraine and working in concert with the Citizens' Network for Foreign Affairs (CNFA), helped stimulate contracts for seven agribusiness projects that leveraged US $24 million in foreign investment for the development of agricultural entrepreneurship.

IFDC Marketing Specialist and Director of FASSU, John H. Allgood, meets with farmers in Uganda.

Photo by Dr. Balu L. Bumb

- IFDC staff completed a study of the fertilizer subsector in the Caucasus Region – Armenia, Azerbaijan, and Georgia – in early 1998. IFDC held a workshop to provide an opportunity for the private sector, donors, and government officials to contribute to the discussions regarding prospects for the development of private-sector input dealers. Discussion is underway for fielding a team to design a project to create and develop the agricultural input markets in the Caucasus Region and employing the IFDC-led approach, which was used in Albania to

develop the private dealers' network through auctions of fertilizer. If successful, this activity will involve close collaboration with the Japan International Cooperation Agency (JICA) since JICA is presently providing fertilizers, seeds, and agricultural machines to the Caucasus region, and such commodities will need to be integrated in a market-friendly manner.

- The IFDC-African Fertilizer Trade and Marketing Information Network (AFTMIN) Program promoted market transparency by providing bi-weekly reports on regional/global fertilizer market conditions for private and government officials in 95% of sub-Saharan countries.

Natural Resource Management and Environmental Protection

- At the request of the Bangladesh Agricultural Research Council (BARC), Dhaka, Bangladesh, IFDC is posting one research management expert in Bangladesh to assist BARC in completing a master plan for nutrient management research, conducting in-service training, and establishing a computerized management system in the BARC for an agricultural research system.
- An IFDC scientist, stationed at the Centro Internacional de Agricultura Tropical (CIAT) until August 1998, studied nutrient management issues in acid savanna soils of Latin America, particularly the role of phosphorus for the efficiency of aluminum-tolerant varieties.
- Following the Soil Fertility Workshop in Lomé, Togo, several countries sought IFDC's assistance in elaborating a national action plan. With funding from the Netherlands Minister for Development Cooperation, a project is assisting sub-Saharan African countries to develop these plans to improve the soil fertility for their country's agricultural development.
- During 1998 the International Fertilizer Industry Association (IFA)-funded project introduced in several locations a village-level technology package that involves a revolving fund. During the first 2 years the project concentrated on four selected villages in Togo, Niger, and Benin, and is expanding to seven additional villages in these countries. Further negotiations are underway to initiate activities in Ghana, Burkina Faso, and Mali. The project aims to strengthen linkages between farmers, fertilizer dealers, extension workers and researchers in order to increase fertilizer use and to improve its efficiency. The project aims to strengthen linkages between farmers, fertilizer dealers, extension workers, and researchers in order to increase fertilizer use and to improve its efficiency.

Women sell maize in this Togolese market.

Photo by Issaka Sanlamboulga, Flash Ivoire

- In collaboration with the African Centre for Fertilizer Development (ACFD) and the Tropical Soil Biology and Fertility Programme (TSBF) and with funding from the International Fund for Agricultural Development (IFAD), IFDC-Africa implemented the second year of onfarm trials in West Africa to validate research results from on-station trials, designed to restore soil fertility in sub-Saharan Africa. In conjunction with this project, IFDC-Africa is collaborating with Hohenheim University, Germany, to test the efficiency of phosphate rock on cereal yields as affected by organic matter and legume/cereal rotation. Additionally, joint demonstration plots with Togolese national institutions have been established to evaluate the effect of soil fertility improvement on fertilizer use efficiency.

- Along with TSBF, IFDC is a co-convenor of the theme, "Combating Nutrient Depletion," under the Soil, Water, and Nutrient Management (SWNM) Ecoregional Initiative of the Consultative Group on International Agricultural Research (CGIAR). A component of IFDC's activity in SWNM involves collaboration with the CGIAR's Ecoregional Program for the Humid and Subhumid Tropics of Sub-Saharan Africa (EPHTA) coordinated by the International Institute for Tropical Agriculture (IITA). Program coordinators have asked IFDC to take the lead in a workshop being organized by IITA for harmonizing methodologies in research in EPHTA benchmark sites and pilot zones.

- During 1998 an IFDC scientist began participating in the Maize Improvement Program of the Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT), based in Nairobi, Kenya. IFDC and CIMMYT have agreed to collaborate in East Africa on research that is focused on sustaining and increasing outputs from maize-based cropping systems throughout the region, especially those found in areas of limited farmer resources, declining fertility, and intractable weed problems. Funded by the Canadian International Development Agency (CIDA), "the East African Cereals Project" (EACP) has maize agronomy and wheat agronomy components.

- At Headquarters IFDC scientists evaluated phosphate rocks from Christmas Island, Tunisia, China, Jordan, and Algeria to assess their agronomic effectiveness. These evaluations were conducted under contract with individual fertilizer companies.

- With funding support from the Thrasher Research Fund, IFDC scientists are conducting a research project entitled "Potential Use of Iron Phosphate Fertilizers to Enrich Iron Nutrition in Food Crops Grown on Alkaline Soils in Developing Countries." The project's objective is to increase the iron nutrition of cereal crops by using iron-rich phosphate fertilizers in alkaline soils.

- Canola is a high-value crop that is primarily used for producing cooking oil. Recent IFDC research shows that direct application of phosphate rock is 80% as effective on alkaline and neutral soils as high-cost, water-soluble fertilizers. This is significant because it allows small-holder farmers in the Middle East to use low-cost phosphate rocks that are found in abundance in most countries of the region to produce canola competitively.

- IFDC continued its research on the presence of cadmium in fertilizer and its ultimate fate in crop production. IFDC has developed a significant data base on the uptake of cadmium from different fertilizer sources. Cadmium research at IFDC has shown the geoclimatic conditions under which cadmium from fertilizer is mobilized in crop production, thus enabling better management techniques to reduce uptake in food crops.

- IFDC continued to participate in a project sponsored by the Food and Agriculture Organization of the United Nations/International Atomic Energy Agency (IAEA), Division of Nuclear Techniques in Food and Agriculture. As part of the research program on "The Use of Nuclear and Related Techniques for Evaluating the Agronomic Effectiveness of Phosphate Fertilizers, in Particular, Rock Phosphates," IFDC has conducted three primary greenhouse experiments to meet part of the objectives of this program. In addition, IFDC also coordinated the collection of minimum data sets by the collaborators from 15 developing countries for testing the phosphorus submodel in crop simulation work.

Management Information Systems

- An IFDC scientist, stationed at the Centro Internacional de la Papa (CIP) in Peru, is developing and implementing integrated assessment models that help stakeholders better understand the complexity of issues related to agricultural and environmental interactions in mountain communities. Partners in this effort include national agricultural research systems, nongovernmental organizations, and universities in Peru, Ecuador, U.S.A., and the Netherlands.

- An IFDC scientist is working with the national agricultural research systems (NARS) in Brazil, Argentina, Uruguay, and Paraguay on nutrient management and the development and application of crop simulation models and Decision Support Systems (DSS). In response to renewed interest, these models are being used to assess the effect of global climate change on agricultural productivity. IFDC staff members are working closely with the National Oceanic and Atmospheric Agency (NOAA) in the validation of these models.

- With partial funding from EMBRAPA, IFDC continued work on the application of decision support systems and crop simulation modeling in Brazil. In collaboration with the Ministry of Agriculture of the State of Parana, Brazil and with their financial support, an IFDC scientist is developing an Information and Decision Support System (IDSS) for that state to use in decision making and for forecasting purposes (crop yields and the effects of El Niño). The IFDC scientist posted in Uruguay is collaborating with IAEA on a project concerning nitrogen use efficiency by irrigated wheat involving the calibration of the CERES-Wheat Model with data from contrasting environments (Africa, Europe, Asia, Latin America). An objective of this project is to better use the model as a tool for improving recommendations for nitrogen fertilizer use on irrigated wheat.

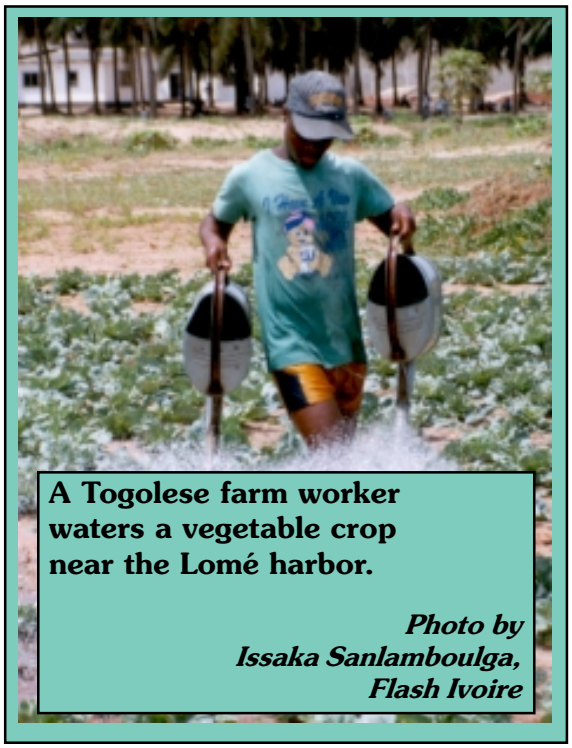
Research workers sample soils in Ecuador.

Photo by Dr. Walter Bowen

- The Headquarters' crop modeling group is involved in updating the Decision Support Systems for Agrotechnology Transfer (DSSAT) Version 3.1. The group is also collaborating with the International Consortium for the Application of Systems Approaches to Agriculture (ICASA) in the application of crop modeling to nutrient management, risk assessment, precision agriculture, and environmental impact. While the demand for the application of crop modeling to policy analysis is high, funds to develop and/or expand are scarce.
- Headquarters' scientists continued research on improving methodology, procedures, computer programs, and data bases to estimate nutrient flows, balances, and rates of nutrient depletion from agricultural lands at country, regional, and global levels. IFDC completed a publication on the development and outcomes of an information system for Africa, designed for such purposes and linked to a geographic information system.

Production Technology Assistance

- IFDC completed a study in 1998 that explored technical and economic aspects of the production of byproducts from potash mining operations. The Asean Potash Mining Company, a private entity partly owned by the Government of Thailand through the Ministry of Industries, contracted with IFDC to undertake this project.
- Since 1993 IFDC has been engaged in a technical assistance project for Petroquimica de Venezuela, S.A. (PEQUIVEN) in Venezuela. During 1998 IFDC provided technical assistance for the construction, commissioning, and startup of a new granular fertilizer plant, while providing support to maintain the momentum gained during the activities of the four previous years.
- Under contract with Breed and McGill, LLC, IFDC conducted successful continuous phosphoric acid production tests using a novel processing method. Patent applications are currently in progress.
- In 1998 IFDC conducted several small-scale granulation tests and numerous physical properties evaluations under contract with U.S. and international companies to increase their market competitiveness.
- IFDC continued to assist FPM Sendirian Bhd., Malaysia, during 1998. FPM uses an IFDC-developed process to produce urea-based NPKs.
- At the request of the Government of Cameroon, an IFDC economist and a physical properties/environmental specialist visited Cameroon to assist in the elaboration of a national soil fertility action plan and an assessment of requirements for establishing a fertilizer regulatory system. The Dutch-funded Policy and Market project is assisting with the first activity; the Government of Cameroon is funding the second activity.



A Togolese farm worker waters a vegetable crop near the Lomé harbor.

Photo by Issaka Sanlamboulga, Flash Ivoire

- Under contract with Ocean Farming, Inc., IFDC continues to develop a floating fertilizer containing phosphates and a chelated iron source. The objective is to promote the growth of phytoplankton, which is the first link in the food chain of the oceans. Results from the 1998 test were promising, and IFDC has produced more material for further ocean testing in 1999.
- Under contract with the Department of Treasury of the U.S. Government, IFDC continued work on a study regarding the use of ammonium nitrate in clandestine activities. IFDC completed the first phase of the study, which dealt with ways to eliminate the commingling of materials at distribution points and dealers' warehouses to avoid interference with the possible tracking of ammonium nitrate. The second phase of the study will establish if the crystal structure and other measurable inherent properties of ammonium nitrate can be used as tracers for determining the point of production and sale of ammonium nitrate. This would serve as an integral taggant that would be useful in forensic analysis to track perpetrators.

Human Capacity Building

During 1998 IFDC conducted eight group training programs for 206 persons from 52 countries. These programs included the following:

1. International Training Program on Computer Simulation for Crop Growth and Management Responses (in Lomé, Togo);
2. International Training Program on Plant Nutrient Management for Sustainable Agriculture (in Bangkok, Thailand);
3. International Training Program on the Development of Fertilizer Recommendations for Optimum Crop Production (in Nairobi, Kenya);
4. International Fertilizer Marketing Training Program (in the U.S.A.);
5. International Study Tour on Fertilizer Distribution and Handling (in India, Malaysia, Singapore, and Australia);
6. International Workshop and U.S. Fertilizer Industry Study Tour – Fertilizer Production Management and Technology (in the U.S.A.);
7. International Workshop and Study Tour on NPK Fertilizer Production Alternatives (in the U.S.A.); and
8. International Fertilizer Marketing Training Program: New Challenges (in Bangkok, Thailand).

IFDC organized nine special programs for participants from Bangladesh, India, Eritrea, Kenya, and Saudi Arabia.

Children of Africa: Hope for a better tomorrow. These Togolese children are leaving a primary school in Tabligbo.

Photo by Issaka Sanlamboulga, Flash Ivoire

El Impacto de las Intervenciones del IFDC: El Punto de Vista a Partir de la Perspectiva de Nuestros Socios

Puntos de Impacto del IFDC

Introducción

Al afrontar algunos de los retos más importantes que está encarando la humanidad durante esta época, el IFDC está haciendo impacto alrededor del mundo – en los países en vías de desarrollo y en las nuevas democracias de Europa oriental y central. Estos retos relacionados a la alimentación de la creciente población mundial se afrontarán a través del mejoramiento de la fertilidad de suelos, el manejo mejorado de nutrientes, y la reforma política para establecer mercados libres y competitivos y sistemas económicos eficientes.

Al aplicar las tecnologías agrícolas innovadoras en una situación de negocios agrícolas, el IFDC está sentando las bases para el alivio de la pobreza en países a través del mundo en vías de desarrollo. En Albania y Bangladesh el IFDC ha enlazado efectivamente la producción agrícola con el desarrollo económico a través del diseño e implementación de políticas económicas que promueven el sistema de mercado libre y conllevan a la eficiencia económica, mayor empleo y el crecimiento económico total. El trabajo del IFDC en el Asia, Africa, Latinoamérica y las nuevas democracias de Europa oriental y central promueven la implementación de los principios de mercadeo que resultan en aumentos en tanto la producción agrícola como el desarrollo económico.

Desarrollo de Mercados

- El Proyecto para el Desarrollo de Industrias y Tecnologías Relacionadas con la Agricultura (ATDP) en Bangladesh demostró claramente los resultados de un espíritu emprendedor y convenció

Varios agricultores del Distrito Tangail de Bangladesh aplican supergránulos de urea a sus cultivos de arroz.

Fotos por ATDP

al Gobierno y a los principiantes en negocios agrícolas que Bangladesh tiene un futuro en los agrinegocios de valor agregado. Los ocho subsectores que se manejan en este proyecto son los de fertilizante, cultivos de semilla y campo, horticultura, avicultura, ganadería, piscicultura, procesamiento de productos agrícolas, maquinaria agrícola y equipo de procesamiento agrícola. Durante 1998 más de 100,000 agricultores aumentaron sus entradas al utilizar tecnologías más productivas y ambientalmente correctas. Se iniciaron noventa y siete zonas de cultivo por contrato/zonas piloto con inversiones de negocios privados. Durante 1998 hubo un aumento de más de $120 millones en productividad como resultado de las inversiones de los negocios privados en el sector agrícola. El proyecto ATDP impulsó 35 reformas de políticas para facilitar el crecimiento de los negocios agrícolas.

- El ATDP abrió caminos en la introducción de tecnología y comercialización. Por ejemplo, la promoción de la tecnología para la aplicación a profundidad del supergránulo de urea (USG) mejoró el cultivo de arroz en Bangladesh. Esta tecnología es más eficiente bajo el cultivo de arroz anegado y, dada la disponibilidad y el costo de la labor en Bangladesh, tiene mayor efectividad de costo que los métodos tradicionales de aplicar urea. El aumento de producción de cosechas, utilizando menos fertilizante, significó un 57% de aumento de entradas netas para los agricultores de arroz. La meta para 1999/2000 es extender esta tecnología a 100,000 ha de arrozales.
- El proyecto IFDC-Albania condujo a la Asociación Albanesa de Distribuidores de Fertilizantes e Insumos Agrícolas (AFADA) a la autosuficiencia. En colaboración con el Fondo Albanés Americano para Empresas (AAEF), a los distribuidores de la AFADA se les facilitó líneas de crédito por un total de US $1.85 millones para la importación de fertilizantes durante el período de tiempo en el cual había sufrido una caída el sistema bancario del estado. La importación total anual de fertilizantes a Albania en 1998 fue de un 83% más alto que aquella en 1997. El IFDC/Albania ayudó a los distribuidores de insumos a establecer centros de Transferencia de Tecnología y un servicio de extensión de sector privado que le suministra al 75% de los pequeños agricultores el acceso a tecnologías más productivas.
- En cooperación con Sasakawa Global 2000 y la USAID, varios miembros del personal del IFDC llevaron a cabo un estudio que identificó los impedimentos principales al desarrollo del mercado de fertilizantes en Mozambique y sugirió medidas pertinentes a políticas y otras para aliviar estos impedimentos. Los miembros del personal hicieron intercambio con forjadores de políticas, agricultores, distribuidores del sector privado, donantes y organizaciones no gubernamentales, y completaron el reporte de estudio títulado "El Mercado de Fertilizantes en Mozambique: Una Evaluación y Una Estrategia para Desarrollo a Largo Plazo." Como parte de la colaboración con la SG2000, también se llevó a cabo un estudio similar en Uganda con el apoyo parcial financiero de la USAID/Uganda.
- Durante 1998, USAID reconociendo la importancia del problema de los nutrientes del suelo en la agricultura sostenible, le solicitó al IFDC que forjara una "Infraestructura Estratégica para el Desarrollo de un Sistema de Suministro de Insumos Agrícolas Africano," el cual aplica en términos prácticos cómo desarrollar mercados de insumos agrícolas en el sector privado en el sub-Sahara africano. Posterior a la preparación se le dará validación de la infraestructura en un taller de trabajo. La infraestructura permitirá que se puedan elaborar los diseños para las intervenciones (políticas y programas) que apoyen o induzcan acción basada sobre el sector privado para aumentar el accesso y el uso a los insumos agrícolas.
- Un especialista en agrinegocios asignado a Ucrania y trabajando en concierto con la Red de Ciudadanos en Pro de Asuntos Extranjeros (CNFA), generó el estímulo de contratos para 7 proyectos de agrinegocios que tuvieron el monto de US $24 millones en inversiones extranjeras para el desarrollo de empresarios agrícolas.

El Especialista en Mercado del IFDC y Director de la FASSU, John H. Allgood, se reúne con varios agricultores en Uganda.

Foto por el Dr. Balu L. Bumb

- El personal del IFDC completó un estudio sobre el subsector de fertilizantes en la Región del Cáucaso-Armenia, Azerbaiján y Georgia – a comienzos de 1998. El IFDC dirigió una reunión de trabajo que prestó la oportunidad para que el sector privado, donantes, y oficiales del gobierno contribuyeran a las discusiones pertinentes a los prospectos para el desarrollo de distribuidores de insumos en el sector privado. Se están celebrando discusiones para enviar un equipo que diseñe un proyecto que cree y desarrolle los mercados de insumos agrícolas en la Región del Cáucaso utilizando los métodos del IFDC, los cuales fueron utilizados en Albania para desarrollar una red de distribuidores privados a través de subastas de fertilizantes. Si se alcanza el éxito, esta actividad se logrará con la colaboración de la Agencia de Cooperación Internacional del Japón (JICA) ya que JICA actualmente está suministrando fertilizantes, semillas y maquinaria agrícola a la Región del Cáucaso, y tales materiales deberan ser integrados en forma que no afecten el mercado.
- El Programa IFDC-Red Africana de Comercio e Información de Mercadeo de Fertilizantes (AFTMIN) promocionó la transparencia del mercado al suministrar reportes sobre las condiciones del mercado de fertilizantes regionales/globales para los oficiales privados y del gobierno al 95% de los países del sub-Sahara.

Manejo de Recursos Naturales y Protección al Medio Ambiente

- A petición del Consejo de Investigación Agrícola de Bangladesh (BARC), Dhaka, Bangladesh, el IFDC está asignando un experto en manejo de investigaaciones en Bangladesh para asistir a la BARC en completar su plan maestro para la investigación del manejo de nutrientes, llevar a cabo entrenamientos de personal, y establecer un sistema computarizado de manejo en el BARC para un sistema de investigación agrícola.
- Un científico del IFDC asignado al Centro Internacional de Agricultura Tropical (CIAT) hasta agosto de 1998, estudió problemas de manejo de nutrientes en suelos ácidos de sabanas en latinoamérica, particularmente el papel del fósforo para la eficiencia de las variedades tolerantes al aluminio.
- Después del Taller de Trabajo sobre Fertilidad de Suelos en Lomé, Togo, varios países solicitaron la ayuda del IFDC para elaborar un plan de acción nacional. El Ministerio de los Países Bajos para la Cooperación Internacional está prestando asistencia a los países del sub-Sahara africano para desarrollar estos planes de mejora de fertilidad de suelos para el desarrollo agrícola de su país.

Varias mujeres venden maíz en el mercado togolés.

Foto por Issaka Sanlamboulga, Flash Ivoire

- Durante 1998 un proyecto patrocinado por la Asociación Internacional de la Industria Fertilizante (IFA) introdujo en varias localidades un paquete de tecnología a nivel de aldea que incluye un fondo rotatorio. Durante los primeros 2 años, el proyecto se concentró en cuatro aldeas seleccionadas en Togo, Níger y Benín y está expandiéndose a siete aldeas adicionales en estos países. Se están haciendo negociaciones actualmente para iniciar actividades en Ghana, Burkina Faso y Malí. El proyecto espera aumentar los enlaces entre los agricultores, distribuidores de fertilizantes, trabajadores de extensión e investigadores con el fín de aumentar el uso de fertilizante y mejorar su eficiencia.

Una agricultora albanesa fertiliza su cultivo en preparación para una cosecha futura.

Foto por el Dr. Thomas P. Thompson

- En colaboración con el Centro Africano para el Desarrollo de Fertilizantes (ACFD) y el Programa sobre Biología y Fertilidad de Suelos Tropicales (TSBF) y dineros del Fondo Internacional de Desarrollo Agrícola (IFAD), el IFDC-Africa implementó el segundo año de pruebas de finca en el Africa Occidental para validar los resultados de las investigaciones de las pruebas hechas en la estación, diseñadas para restaurar la fertilidad de suelos en el sub-Sahara africano. En conjunto con este proyecto, el IFDC-Africa está colaborando con la Universidad de Hohenheim, Alemania, para probar la eficiencia de la roca fosfórica en los rendimientos de cereales y cómo son afectados por la materia orgánica y la rotación de legumbres/cereales. Adicionalmente, se han establecido en forma conjunta con varias instituciones nacionales togolesas, una serie de lotes de demostración para evaluar el efecto del mejoramiento de la fertilidad de suelos en la eficiencia del uso de fertilizantes.

- El TSBF junto con el IFDC es copatrocinador del tema "Combatiendo la Pérdida de Nutrientes" de la Iniciativa Ecoregional para el Manejo de Suelos, Agua y Nutrientes (SWNM) del Grupo Consultivo sobre Investigación Agrícola Internacional (CGIAR). Un componente de la actividad del IFDC con el SWNM es la colaboración con el Programa Ecoregional para los Trópicos Húmedos y Subhúmedos del Sub-Sahara Africano (EPHTA) que está siendo coordinado por el Instituto Internacional para la Agricultura Tropical (IITA). Los coordinadores del programa le han solicitado al IFDC que tome las riendas en un taller de trabajo que está organizando el IITA para harmonizar las metodologías de investigación en los sitios clave y zonas piloto del EPHTA.

- Durante 1998 un científico del IFDC comenzó a participar en el Programa de Mejoramiento de Maíz del Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT), con sede en Nairobi, Kenia. El IFDC y el CIMMYT han acordado colaborar en el Africa Oriental en investigaciones que harán enfoque sobre el sostenimiento y el aumento de rendimientos a partir de sistemas que son a base de cosechas de maíz a través de esta región, especialmente aquellos en las áreas de recursos limitados para el cultivo, pérdidas de fertilidad y problemas severos de hierbas. Operando con fondos de la Agencia Canadiense para el Desarrollo Internacional (CIDA) "el Proyecto de Cereales del Africa Oriental" (EACP) tiene componentes de la agronomía del maíz y trigo.

- En la Sede, científicos del IFDC evaluaron rocas fosfóricas de la Christmas Island, Tunisia, China, Jordania y Argelia para evaluar su efectividad económica. Estas evaluaciones se llevaron a cabo bajo contrato con empresas individuales de fertilizantes.

- Con los fondos de apoyo de la Thrasher Research Fund, los científicos del IFDC están llevando a cabo un proyecto titulado "El Uso Potencial de Fertilizantes de Fosfato de Hierro para Enriquecer la Nutrición de Hierro en Cosechas de Alimentos Cultivados en Suelos Alcalinos en Países en Desarrollo." El objetivo del proyecto es aumentar la nutrición de cultivos de cereales al utilizar fosfatos fertilizantes ricos en hierro en los suelos alcalinos.

- La colza (canola) es un cultivo de alto valor que se utiliza principalmente para producir aceite para cocinar. En investigaciones recientes del IFDC se demuestra que la aplicación directa de la roca fosfórica es un 80% tan efectiva en los suelos alcalinos y neutrales así como los fertilizantes de alto costo, solubles en agua. Esto es significativo porque permite que el pequeño agricultor utilice rocas fosfóricas de bajo costo que se encuentran en abundancia en la mayor parte de los países de la región que producen la colza competitivamente.

- El IFDC continuó su investigación sobre la presencia del cadmio en fertilizantes y donde terminan estos minerales finalmente en la producción de cosechas. El IFDC ha desarrollado una significativa base de datos sobre la absorción del cadmio a partir de varias fuentes de fertilizantes. Las investigaciones de cadmio en el IFDC han demostrado las condiciones geoclimáticas bajo las cuales se mobiliza el cadmio a partir del fertilizante en la producción de cosechas, permitiendo así que mejores técnicas de manejo reduzcan la absorción en las cosechas alimenticias.
- El IFDC continuó su participación en un proyecto patrocinado por la Organización de las Naciones Unidas para la Agricultura y la Alimentación/Organismo Internacional de Energía Atómica (IAEA), División de Técnicas Nucleares en Alimentos y Agricultura. Como parte del programa de investigación sobre "El Uso de Técnicas Nucleares y Relacionadas para Evaluar la Efectividad Agronómica de Fosfatos Fertilizantes, en Particular Roca Fosfórica," el IFDC ha llevado a cabo tres experimentos primarios de invernadero para cumplir con parte de los objetivos de este programa. Adicionalmente, el IFDC también coordinó la recopilación de un mínimo compendio de datos con colaboradores de 15 países en desarrollo para probar el submodelo del fósforo en los trabajos de simulación de cosechas.

Sistemas de Manejo de Información

- Un científico del IFDC, asignado al Centro Internacional de la Papa (CIP) en el Perú, está desarrollando e implementando modelos de evaluación integrada que ayudan a los interesados a comprender mejor la complejidad de los temas relacionados a las interacciones agrícolas y ambientales en comunidades montañosas. Los socios en este esfuerzo incluyen algunos sistemas nacionales de investigación agrícola, organizaciones no gubernamentales, y universidades en el Perú, Ecuador, EE.UU. y los Países Bajos.
- Un científico del IFDC está trabajando con los sistemas nacionales de investigación agrícola (NARS) en el Brasil, Argentina, Uruguay y Paraguay sobre el manejo de nutrientes y el desarrollo y aplicación de los modelos de simulación de cosechas y Sistemas de Apoyo para la Toma de Decisiones (DSS). En respuesta

Varios trabajadores de investigación toman pruebas de suelos en el Ecuador.

Foto por el Dr. Walter Bowen

al renovado interés, estos modelos están siendo utilizados para evaluar el efecto de los cambios climáticos globales en la productividad agrícola. Los miembros del personal del IFDC están trabajando en concierto con la Agencia Nacional Oceánica y Atmosférica (NOAA) para la validación de estos modelos.

- Con fondos parciales de EMBRAPA, el IFDC continuó trabajos en la aplicación de sistemas de apoyo para la toma de decisiones y modelos de simulación de cosechas en el Brasil. En colaboración con el Ministerio de Agricultura del Estado de Paraná, Brasil y con su apoyo financiero, un científico del IFDC está desarrollando un Sistema de Información y Apoyo para la Toma de Decisiones (IDSS) para que ese estado lo utilice en la toma de decisiones y para asuntos de pronósticos (rendimientos de cosechas y los efectos de El Niño). El científico del IFDC asignado al Uruguay está colaborando con la IAEA en un proyecto que tiene que ver con la eficiencia del uso de nitrógeno por el trigo irrigado en base a la calibración del Modelo de Trigo-CERES con respecto a los ambientes contrastantes (Africa, Europa, Asia, Latinoamérica). Un objetivo de este proyecto es cómo utilizar mejor el modelo en forma de herramienta para mejorar las recomendaciones en el uso de nitrógeno fertilizante para el trigo irrigado.
- El grupo de modelaje de cosechas de la Sede se encuentra actualizando el Sistemas de Apoyo para la Toma de Decisiones en la Transferencia de Agrotecnología (DSSAT) Versión 3.1. El grupo también está colaborando con el Consorcio Internacional para la Aplicación de Sistemas Agrícolas (ICASA) en la aplicación de modelos de cosechas al manejo de nutrientes, evaluación de riesgos, la agricultura de precisión y el impacto ambiental. Mientras que la demanda para la aplicación del modelo de cosechas al análisis de políticas es alta, los fondos para desarrollar y/o expandir éstos son escasos.
- Los científicos en la Sede continuaron las investigaciones sobre el mejoramiento de la metodología, procedimientos, programas de computador y bases de datos para estimar los flujos de nutrientes, balances y tasas de desgaste de nutrientes de tierras agrícolas a niveles de país, regional y global. El IFDC completó una publicación sobre el desarrollo y resultados de un sistema de información para el Africa, diseñado para tales propósitos y enlazados a un sistema geográfico de información.

Asistencia en Tecnología de Producción

- El IFDC completó un estudio de mercadeo en 1998 que exploró los aspectos técnicos y económicos de la producción de subproductos a partir de las operaciones mineras de potasio. La Asian Potash Mining Company, una entidad privada de la cual es dueño parcial el Gobierno de Tailandia a través del Ministerio de Industrias, contrató con el IFDC para llevar a cabo este proyecto.
- Desde 1993 el IFDC ha estado vinculado a un proyecto de asistencia técnica para la Petroquímica de Venezuela, S.A, (PEQUIVEN) en Venezuela. Durante 1998 el IFDC prestó asistencia técnica para la construcción, comisión y arranque de una nueva planta de fertilizante granular, mientras prestaba apoyo para mantener el ímpetu logrado durante las actividades de los últimos 4 años.

Un trabajador togolés de granja riega un cultivo de vegetables cerca de la bahía de Lomé.

Foto por Issaka Sanlamboulga, Flash Ivoire

- Estando bajo contrato con la Breed and McGill, LLC, el IFDC dirigió en forma exitosa pruebas contínuas de producción de ácido fosfórico utilizando un método novedoso de procesamiento. La solicitud para lograr una patente de este método ya está en progreso.
- En 1998 el IFDC dirigió varias pruebas de granulación a pequeña escala y numerosas evaluaciones de propiedades físicas bajo contrato con empresas de los EE.UU. e internacionales para aumentar su competitividad en el mercado.
- El IFDC continuó su asistencia al FPM Sendirian Bhd., Malaysia, durante 1998. La FPM utiliza un proceso desarrollado por el IFDC para producir NPKs a base de urea.
- A petición del Gobierno de Camerún, un economista del IFDC y un especialista en propiedades físicas/ambientales visitaron a Camerún para asistir en la elaboración de un plan nacional de acción para la fertilidad de suelos y una evaluación de los requerimientos para establecer un sistema regulatorio de

fertilizantes. El proyecto de Política y Mercadeo financiado con fondos holandeses está prestando asistencia con la primera actividad; el Gobierno de Camerún está financiando la segunda.

- Bajo contrato con la Ocean Farming, Inc., el IFDC continúa desarrollando un fertilizante flotante que contiene fosfatos y una fuente de hierro quelado. El objetivo es promover el crecimiento del fitoplankton, el cual es el primer eslabón en la cadena alimenticia de los oceános. Los resultados de la prueba hecha en 1998 fueron prometedores, y el IFDC ha producido más material para pruebas adicionales en 1999.
- Bajo contrato con el Departamento de Tesorería del Gobierno de los EE.UU., el IFDC continuó trabajos en un estudio sobre el uso del nitrato de amonio en actividades clandestinas. El IFDC completó la primera fase del estudio que tuvo que ver con las formas de eliminar que los materiales se intermezclen en los puntos de distribución y bodegas de los distribuidores para evitar la interferencia con el rastreo del nitrato de amonio. La segunda fase del estudio establecerá si la estructura del cristal y otras propiedades inherentes medibles del nitrato de amonio pueden ser utilizadas como huellas para determinar el punto de producción y venta del nitrato de amonio. Esto serviría de marcador interno que sería útil en los análisis forénsicos para rastrear a los perpetradores.

Capacitación Humana

Durante 1998 el IFDC condujo ocho programas de entrenamiento en grupos para 206 personas de 52 países. Estos programas incluyeron lo siguiente:

1. Programa Internacional de Entrenamiento sobre Simulación en Computador para el Crecimiento de Cultivos y las Respuestas de Manejo (en Lomé, Togo);
2. Programa Internacional de Entrenamiento sobre el Manejo de Nutrientes de Planta para la Agricultura Sostenible (en Bangkok, Tailandia);
3. Programa Internacional de Entrenamiento sobre el Desarrollo de Recomendaciones para la Producción Optima de Cosechas (en Nairobi, Kenia);
4. Programa Internacional de Entrenamiento de Mercadeo de Fertilizantes (en los EE.UU);
5. Gira Internacional de Estudio sobre la Distribución y el Manejo de Fertilizantes (en India, Malasia, Singapur, y Australia);
6. Taller Internacional de Trabajo y Gira de Estudio de la Industria Fertilizante de los EE.UU. – Producción, Manejo y Tecnología de Fertilizantes (en los EE.UU.);
7. Taller Internacional de Trabajo y Gira de Estudio sobre Alternativas a la Producción de Fertilizantes de NPK (en los EE.UU.); y
8. Programa Internacional de Entrenamiento de Mercadeo de Fertilizantes: Nuevos Retos (en Bangkok, Tailandia).

El IFDC organizó nueve programas especiales para participantes de Bangladesh, India, Eritrea, Kenia y Arabia Saudita.

Niños del Africa: Esperanza para un futuro mejor. Estos niños togoleses están saliendo de una escuela primaria en Tabligbo.

Foto por Issaka Sanlamboulga, Flash Ivoire

Les Jalons des Réalisations de l'IFDC

Introduction

En s'attaquant à quelques-uns des principaux défis auxquels est confrontée l'humanité au cours de cette décennie, l'IFDC imprime un mouvement autour du globe tant dans les pays en voie de développement que dans les nouvelles démocraties de l'Europe de l'Est et du Centre. Ces défis ont trait à l'alimentation d'une population mondiale en pleine expansion par le biais de l'amélioration de la fertilité des sols, une meilleure gestion des éléments nutritifs et les réformes de politiques en vue d'établir des marchés ouverts et compétitifs et des systèmes économiques efficaces.

En appliquant des technologies agricoles novatrices dans le cadre des agro-industries, l'IFDC propose un canevas pour la réduction de la pauvreté dans les pays du monde en développement. En Albanie et au Bangladesh, l'IFDC a mis en oeuvre une stratégie efficace qui lie la production agricole au développement économique dans son ensemble. Cette stratégie intègre l'élaboration et l'application de politiques économiques aptes à promouvoir le système de marché libre, l'efficacité économique, la création d'emplois et la croissance économique globale. Les actions de l'IFDC en Asie, en Afrique, en Amérique latine et dans les nouvelles démocraties de l'Europe de l'Est et du Centre favorisent la mise en application des principes commerciaux qui sous-tendent l'accroissement de la production agricole et le développement économique.

Des paysans de la région du Tangail au Bangladesh appliquent des supergranules d'urée dans leurs rizières.

ATDP photos

Développement de Marché

- L'Agrobased Industries Technology Development Project (ATDP) au Bangladesh a manifestement montré les fruits de l'esprit d'entreprise. Son succès a contribué à convaincre le Gouvernement ainsi que les entrepreneurs en herbe que le Bangladesh a de l'avenir dans le domaine des agro-industries. Ce projet touche à huit sous-secteurs dont les engrais, les semences et les cultures, l'horticulture, l'aviculture, l'élevage, la pêche, la transformation des produits agricoles, la machinerie agricole et le matériel de transformation agricole. En 1998, plus de 100 000 exploitants agricoles ont pu augmenter leurs revenus en utilisant des technologies plus performantes et plus saines sur le plan environnemental. Quatre-vingt-dix-sept cultivateurs contractuels en zones pilotes ont été initiés aux investissements dans l'entreprise privée. Au cours de l'année 1998 également une augmentation de la productivité d'une valeur excédant 120 millions de dollars américains a été réalisée grâce à des investissements privés dans le secteur agricole. Le projet ATDP a lancé trente-cinq réformes de politique visant à faciliter la croissance des agro-industries.

- L'ATDP a progressé dans l'introduction et la commercialisation des technologies. Ainsi, l'introduction de la technique de placement en profondeur des supergranules d'urée a permis d'améliorer la riziculture au Bangladesh. Cette technique est plus efficace dans la culture du riz aquatique. Vu l'abondance et le faible coût de la main-d'oeuvre au Bangladesh, elle est plus rentable que les méthodes traditionnelles d'application d'urée. L'augmentation de la production agricole avec une utilisation moindre d'engrais s'est traduite par un accroissement de 57 pour cent des bénéfices nets des riziculteurs. L'objectif pour 1999/2000 est de développer cette technique sur 100 000 hectares rizicoles.

- Le Projet IFDC-Albanie a mené à l'autosuffisance l'Albanian Fertilizer and Agricultural Input Dealers' Association (AFADA). En collaboration avec l'Albanian American Enterprise Fund (AAEF), les distributeurs de l'AFADA ont bénéficié de lignes de crédit s'élevant à un total de 1,85 million de dollars américains pour l'importation d'engrais à une période où le système bancaire public s'était effondré. Le total des importations annuelles d'engrais en Albanie en 1998 était de 83 pour cent plus élevé que celui de 1997. L'IFDC/Albanie a aidé les distributeurs d'intrants à établir des Centres de transfert de technologies et un service privé de vulgarisation qui donne à 75 pour cent des 400 000 petits exploitants l'accès à des techniques plus productives.

- En coopération avec Sasakawa Global 2000 et l'USAID, des chercheurs de l'IFDC ont mené une étude qui a permis d'identifier les principales contraintes au développement du marché des engrais au Mozambique et de proposer des mesures d'ordre politique et autres pour les réduire. Ces chercheurs se sont entretenus avec des décideurs, des agriculteurs, des distributeurs du secteur privé, des bailleurs de fonds et des organisations non gouvernementales et ont rédigé un rapport intitulé, "The Fertilizer Market in Mozambique: An Assessment and a Strategy for Long Term Development." Dans le cadre de la collaboration avec SG 2000, une étude similaire a été conduite en Ouganda avec l'appui financier partiel de l'USAID/Ouganda.

- Conscient de l'importance du problème des éléments nutritifs du sol pour l'agriculture durable, l'USAID a demandé à l'IFDC d'élaborer un "Cadre stratégique pour l'élaboration d'un système d'approvisionnement en intrants agricoles en Afrique," qui traite en termes pratiques des moyens de développer des marchés d'intrants agricoles privés en Afrique subsaharienne. La préparation de cet outil a été suivie de sa validation lors d'un récent atelier. Ce cadre stratégique aidera les acteurs à concevoir des interventions (politiques et programmes) susceptibles d'appuyer ou de susciter la participation du secteur privé en vue d'accroître l'accessibilité et l'utilisation des intrants agricoles.

Un spécialiste du marketing de l'IFDC et Directeur du FASSU, John H. Allgood, rencontre des paysans en Ouganda.
Photo, Dr Balu L. Bumb

- Un spécialiste en agro-industries de l'IFDC, basé en Ukraine a travaillé en collaboration avec le Citizens' Network for Foreign Affairs (CNFA) à élaboration de contrats pour sept projets d'agro-industrie qui ont réuni 24 millions de dollars américains en investissement étranger pour le développement de l'esprit d'entreprise en agriculture.

- Une équipe de l'IFDC a réalisé, au début de l'année 1998, une étude du sous-secteur des engrais dans la Région du Caucase -l'Arménie, l'Azerbaïdjan et la Géorgie. L'IFDC a organisé un atelier qui a permis à des représentants du secteur privé, des bailleurs de fonds et à des responsables gouvernementaux de contribuer aux débats concernant les perspectives de développement d'un réseau de distributeurs privés d'intrants. Une discussion a été engagée autour de la possibilité d'envoyer sur le terrain une équipe ayant pour tâche de concevoir un projet de création et de développement de marchés d'intrants agricoles dans la Région du Caucase en utilisant l'approche de l'IFDC qui a servi à développer en Albanie un réseau de distributeurs privés sur la base des ventes aux enchères d'engrais. Si ce projet aboutissait, il impliquerait une étroite collaboration avec la Japan International Co-operation Agency (JICA) qui fournit actuellement des engrais, des semences et des machines agricoles à la région du Caucase, puisqu'il faudra intégrer ces produits dans un système compatible avec le marché.

- Le Réseau africain d'information sur le commerce et la distribution des engrais (AFTMIN) qui est géré par l'IFDC-Afrique a favorisé la transparence du marché grâce à la publication de rapports mensuels sur les conditions du marché régional et mondial des engrais. Ces rapports sont destinés à des responsables du secteur privé et de l'administration publique dans 95 pour cent des pays subsahariens.

Gestion des Ressources Naturelles et Protection de l'Environnement

- A la demande du Bangladesh Agricultural Research Council (BARC), Dhaka, Bangladesh, l'IFDC s'apprête à détacher un expert au Bangladesh dans le but d'aider BARC à finaliser un plan directeur pour la recherche en gestion des éléments nutritifs, l'organisation de la formation en cours d'emploi et l'établissement au sein du BARC d'un système informatisé de gestion de la recherche agricole.

Vendeuses de maïs dans un marché du Togo.

Photo, Issaka Sanlamboulga, Flash Ivoire

- Un chercheur de l'IFDC fut détaché au Centro Internacional de Agricultura Tropical (CIAT) jusqu'au mois d'août. Il a centré ses travaux sur la gestion des éléments nutritifs dans les sols acides des savanes de l'Amérique latine, et particulièrement sur le rôle du phosphore dans l'efficacité des variétés tolérantes à l'aluminium.

- A la suite d'un atelier sur la fertilité des sols tenu à Lomé, Togo, plusieurs pays ont sollicité l'aide de l'IFDC pour l'élaboration d'un plan d'action national. Le projet financé par le gouvernement néerlandais aide les pays subsahariens à élaborer des plans visant à l'amélioration de la fertilité des sols pour le développement agricole durable.

- En 1998, le projet financé par l'International Fertilizer Industry Association (IFA) était axé sur l'introduction d'un paquet technologique à l'échelle villageoise comportant un fonds de roulement. Durant les deux premières années, le projet s'est concentré sur quatre villages choisis au Togo, au Niger, et au Bénin. Ses

activités s'étendent désormais à sept autres villages dans les mêmes pays. Des négociations sont en cours en vue d'initier des activités au Ghana, au Burkina Faso et au Mali. Le projet vise à renforcer les liens entre les paysans, les distributeurs d'engrais, les vulgarisateurs et les chercheurs afin d'augmenter l'utilisation des engrais et d'améliorer leur efficacité.

- En collaboration avec l'African Centre for Fertilizer Development (ACFD) et le Tropical Soil Biology and Fertility Programme (TSBF) et grâce au financement du Fonds international de développement agricole (FIDA), l'IFDC-Afrique a réalisé la seconde année d'essais en champ en Afrique de l'Ouest dans le but de valider les résultats des essais en station portant sur la restauration de la fertilité des sols en Afrique subsaharienne. Conjointement avec ce projet, l'IFDC-Afrique collabore avec l'Université Hohenheim d'Allemagne, à l'essai sur l'efficacité du phosphate naturel sur les rendements céréaliers après application de matières organiques et rotation céréale/légume. Par ailleurs, des parcelles de démonstration ont été installées en collaboration avec des institutions nationales togolaises en vue d'évaluer les effets de l'amélioration de la fertilité des sols sur l'efficacité de l'utilisation des engrais.
- Avec le TSBF, l'IFDC est co-responsable du thème, "Lutte contre l'épuisement de la fertilité des sols" dans le cadre de l'initiative écorégionale intitulée: Soil, Water and Nutrient Management (SWNM) du Groupe consultatif pour la recherche agricole internationale (CGIAR). Le rôle de l'IFDC relatif à la SWNM implique une collaboration avec le Programme écorégional du CGIAR pour les zones tropicales humides et subhumides de l'Afrique subsaharienne (EPHTA) coordonné par l'Institut international d'agriculture tropicale (IITA). Les coordinateurs du programme ont demandé à l'IFDC de diriger l'atelier que l'IITA organise en vue d'harmoniser les méthodologies de recherche sur les sites expérimentaux et dans les zones pilotes de l'EPHTA.
- En 1998, un chercheur de l'IFDC a commencé à participer au programme pour l'amélioration du maïs du Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT), basé à Nairobi, Kenya. L'IFDC et CIMMYT ont convenu de collaborer en Afrique de l'Est à une recherche axée sur la croissance et le maintien des rendements des systèmes de production de maïs à travers la région, en particulier, ceux en usage dans les zones où les agriculteurs sont pauvres en ressources, la fertilité décroissante, et le problème des mauvaises herbes persistant. Financé par l'Agence canadienne de développement internationale (ACDI), le "East African Cereals Project" comporte une composante maïs et une composante blé.
- Au Siège, des chercheurs de l'IFDC ont procédé à l'évaluation des phosphates naturels de l'île Christmas, de la Tunisie, de la Chine, de la Jordanie et de l'Algérie en vue de déterminer leur efficacité agronomique. Ces évaluations entrent dans le cadre de contrats passés avec des compagnies d'engrais intéressées.
- Avec le concours financier de Thrasher Research Fund, les chercheurs de l'IFDC exécutent un projet de recherche intitulé "L'utilisation potentielle des phosphates ferreux pour enrichir la nutrition en fer des cultures vivrières dans les sols alcalins des pays en voie de développement." L'objectif du projet est d'améliorer la nutrition en fer des cultures céréalières par l'utilisation des engrais phosphatés dans les sols alcalins.
- Le colza est une culture très prisée qui sert essentiellement à la production d'huile de cuisine. Une recherche récente menée par l'IFDC démontre que l'application directe du phosphate naturel est à 80 pour cent aussi efficace sur les sols alcalins et neutres que les engrais solubles dans l'eau qui sont très coûteux. Cette recherche est importante parce qu'elle permet aux petits exploitants du Moyen-Orient d'utiliser le phosphate naturel bon marché et disponible en grande quantité dans la plupart des pays de la région pour produire du colza de façon concurrentielle.
- L'IFDC a poursuivi sa recherche sur la présence de cadmium dans les engrais et sur le devenir de cet élément dans la production agricole. L'IFDC a développé une importante base de données sur l'absorption de cadmium de différentes sources d'engrais. Ces travaux ont mis en évidence les conditions géo-climatiques

qui favorisent la mobilisation du cadmium des engrais dans la production agricole. Cela permet d'appliquer de meilleures techniques de gestion pour réduire l'absorption de cadmium par les cultures vivrières.

- L'IFDC a encore participé à un projet financé par l'Organisation des Nations Unies pour l'alimentation et l'agriculture et la Division de techniques nucléaires en alimentation et en agriculture de l'Agence internationale de l'énergie atomique. Dans le cadre du programme de recherche sur "L'utilisation de l'énergie nucléaire et des techniques connexes pour l'évaluation de l'efficacité agronomique des engrais phosphatés, en particulier, des phosphates naturels," l'IFDC a procédé à trois expériences en serre couvrant une partie des objectifs de ce programme. Par ailleurs, l'IFDC a coordonné la collecte de séries minimales de données par les collaborateurs de quinze pays en voie de développement pour tester le sous-modèle phosphore dans les travaux de simulation des cultures.

Systèmes de Gestion des Informations

- Un chercheur de l'IFDC basé au Centro Internacional de la Papa (CIP) au Pérou élabore et met en oeuvre des modèles d'évaluation intégrée, qui aident les partenaires à mieux comprendre la complexité des questions liées aux interactions entre agriculture et environnement dans des communautés montagnardes. Parmi les partenaires impliqués dans cet effort se trouvent des systèmes de recherche nationaux, des organisations non gouvernementales, des universités du Pérou, de l'Equateur, des Etats-Unis et des Pays-Bas.
- Un chercheur de l'IFDC effectue des travaux en collaboration avec les systèmes nationaux de recherche agricole (NARS) au Brésil, en Argentine, en Uruguay et au Paraguay sur la gestion des éléments nutritifs et sur l'élaboration et l'application de modèles de simulation et de Systèmes d'aide à la décision (SAD). Ces modèles servent à déterminer les effets du changement climatique global sur la productivité agricole. Les chercheurs de l'IFDC es agricoles à l'échelle nationale, régionale et mondiale. L'IFDC a réalisé une publication sur l'élaboration et les avantages d'un système d'information pour l'Afrique, qui a été conçu à cet effet et lié à un système d'information géographique.

Des chercheurs prélèvent des échantillons de sol en Equateur.

Photo, Dr Walter Bowen

- Avec un financement partiel de l'EMBRAPA, l'IFDC a poursuivi ses travaux portant sur la mise en application des Systèmes d'aide à la décision et des modèles de simulation au Brésil. Avec la collaboration du ministère de l'Agriculture de l'Etat de Parana, et avec leur soutien financier, un chercheur de l'IFDC s'attache à mettre au point un Système d'information et d'aide à la décision (SIAD) qui sera utile pour les décideurs publics et privés et permettra de faire des prévisions concernant, par exemple, les rendements des cultures et les effets d'EL Niño. Un chercheur de l'IFDC affecté en Uruguay collabore avec l'Agence internationale de l'énergie atomique (AIEA) à un projet relatif à l'utilisation efficace de l'azote sur le blé irrigué, qui implique le calibrage du modèle de blé CERES à l'aide de données recueillies dans des environnements contrastés (Afrique, Europe, Asie, Amérique Latine). L'un des objectifs de ce projet est d'exploiter ce modèle comme un outil pour affiner les recommandations concernant l'utilisation des engrais azotés sur le blé irrigué.
- Le Groupe de modélisation du Siège travaille à la mise à jour du Decision Support Systems for Agrotechnology Transfer (DSSAT) Version 3.1. Le groupe collabore également avec l'International Consortium for the Application of Systems Approaches to Agriculture (ICASA) et à l'application de la modélisation à la gestion des éléments nutritifs, à l'évaluation des risques, à l'agriculture de précision, et à l'étude des effets sur l'environnement. Bien qu'il existe une forte demande relative à l'emploi de la modélisation dans le domaine de l'analyse de politique, les fonds nécessaires pour son développement et/ou sa vulgarisation se font rares.
- Des progrès ont été accomplis dans les recherches visant à améliorer la méthodologie, les procédures, les programmes et les bases de données servant à estimer les flux, les bilans, et les taux d'épuisement des éléments nutritifs des terres agricoles à l'échelle nationale, régionale et mondiale. L'IFDC a réalisé une publication sur l'élaboration et les avantages d'un système d'information pour l'Afrique, qui a été conçu à cet effet et est lié à un système d'information géographique.

Aide à la Technologie de Production

- En 1998, l'IFDC a réalisé une étude sur les aspects techniques et économiques de la gestion des sous-produits de l'exploitation des mines de potasse. Cette étude s'inscrit dans le cadre d'un contrat passé avec l'Asean Potash Mining Company, une société privée dont le Gouvernement de la Thaïlande est actionnaire par l'intermédiaire du ministère de l'Industrie.
- Depuis 1993, l'IFDC mène un projet d'assistance technique pour Petroquimica de Venezuela, S.A. (PEQUIVEN) au Venezuela. En 1998, cette assistance était axée sur la construction et la mise en service d'une nouvelle usine d'engrais granulés, tout en essayant de maintenir le rythme des activités des quatre années précédentes.
- Dans le cadre d'un contrat passé avec Breed and McGill, LLC, l'IFDC a réalisé avec succès des essais de production continue de l'acide phosphorique en utilisant une nouvelle méthode de transformation. La demande de brevet a été déposée.

Un ouvrier agricole togolais arrose une culture maraîchère dans le voisinage du port de Lomé.

Photo, Issaka Sanlamboulga, Flash Ivoire

- En 1998, l'IFDC a procédé à plusieurs essais de granulation à petite échelle et à de nombreuses évaluations des propriétés physiques dans le cadre de contrats conclus avec des compagnies américaines et internationales. Ces efforts visent à rendre ces compagnies plus compétitives.
- L'appui que l'IFDC fournit à FPM Sendirian Bhd., Malaisie, s'est poursuivi au cours de l'année 1998. FPM utilise des procédés mis au point par l'IFDC pour produire des NPK à base d'urée.
- A la demande du gouvernement du Cameroun, un économiste de l'IFDC et un spécialiste des propriétés physiques et de l'environnement se sont rendus au Cameroun pour aider à l'élaboration d'un plan d'action national pour la fertilité des sols et à l'estimation des besoins relatifs à l'établissement d'un système de réglementation des engrais. Le Programme politique

et marché de l'IFDC-Afrique financé par le gouvernement néerlandais aide à l'exécution de la première activité. Le gouvernement du Cameroun finance la deuxième activité.

- Dans le cadre d'un contrat conclu avec l'Oceanic Farming, Inc., l'IFDC met au point un engrais aquatique contenant des phosphates et une source de fer chelaté. L'objectif de cette recherche est de favoriser la croissance du plancton qui constitue le premier maillon dans la chaîne alimentaire des océans. Les résultats obtenus des essais de 1998 ont été encourageants. L'IFDC a préparé du matériel pour d'autres essais en mer en 1999.
- Dans le cadre d'un contrat conclu avec le ministère des Finances des Etats-Unis, l'IFDC a poursuivi une étude relative à l'utilisation du nitrate d'ammonium pour des activités clandestines. L'IFDC a terminé la première phase de cette étude qui portait sur les moyens d'empêcher le mélange des produits aux centres de distribution et dans les entrepôts des négociants pour éviter les interférences avec le dépistage éventuel du nitrate d'ammonium. La seconde phase de l'étude consistera à déterminer si la structure cristalline et d'autres propriétés naturelles mesurables du nitrate d'ammonium peuvent être utilisées comme des éléments-traces pour déterminer le point de production et de vente du nitrate d'ammonium. Cette sorte d'étiquette intégrante sera utile pour les analyses des experts légistes, qui permettront de découvrir les coupables.

Développement des Ressources Humaines

Au cours de l'année 1998, l'IFDC a réalisé huit programmes de formation de groupe pour 206 personnes de 52 pays.

1. Programme international de formation sur La simulation par ordinateur de la croissance des cultures et des réponses à la gestion (à Lomé, Togo);
2. Programme international de formation sur La gestion des éléments nutritifs pour l'agriculture durable (à Bangkok, Thaïlande);
3. Programme international de formation sur L'élaboration de recommandations en matière d'engrais pour une production agricole optimale (à Nairobi, Kenya);
4. Programme international de formation sur La commercialisation des engrais (aux Etats-Unis);
5. Voyage d'étude international sur La distribution et la manutention des engrais (en Inde, Malaisie, Singapour et Australie);
6. Atelier international et voyage d'étude sur L'industrie des engrais aux Etats-Unis- gestion et technologie de production (aux Etats-Unis);
7. Atelier international et voyage d'étude sur Les alternatives de production d'engrais NPK (aux Etats-Unis); et
8. Programme international de formation sur La commercialisation des engrais: les nouveaux défis (Bangkok, Thaïlande).

L'IFDC a organisé neuf programmes spéciaux pour des participants du Bangladesh; de l'Inde, de l'Erythrée, du Kenya et de l'Arabie Saoudite.

Enfants d'Afrique: espoir d'un lendemain meilleur. Des enfants togolais à la sortie d'une école primaire à Tabligbo.

Photo, Issaka Sanlamboulga, Flash Ivoire

The Impact of IFDC's Interventions: The View From Our Partners' Perspectives

IFDC cooperates with a multitude of institutions involved in agricultural research and development; these linkages extend to a wide range of international, national, and nongovernmental organizations, public and private sector institutions, universities, and farmers around the world. Below are several case histories of IFDC's partnerships with farmers, scientists, and decision makers. These personalized accounts illustrate the mutual value of our partnerships with scientists from the NARS, decisionmakers, and farmers around the world. The case histories present some of the results of IFDC's work as viewed through our partners' eyes in Albania, Bangladesh, Niger, Peru, Uruguay, and Venezuela.

"Eight Case Studies Illustrating the Mutual Value of Our Partnerships With Farmers, Scientists, and Decisionmakers"

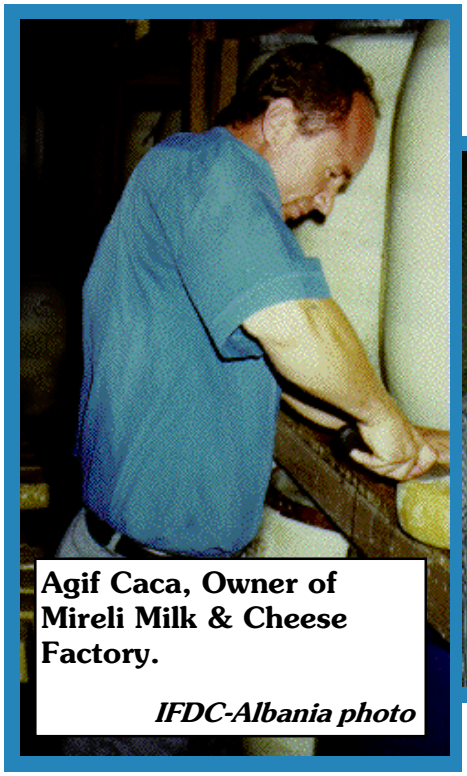
Eastern Europe –

Albanian Project Opens Doors for That Country's Entrepreneurs

With funding from USAID, an IFDC project that began in 1992 has established that the open market system will work in Albania. The impact of the overall project is that it has assisted in increasing food productivity, promoted agribusiness development, and demonstrated the potential for agricultural development.

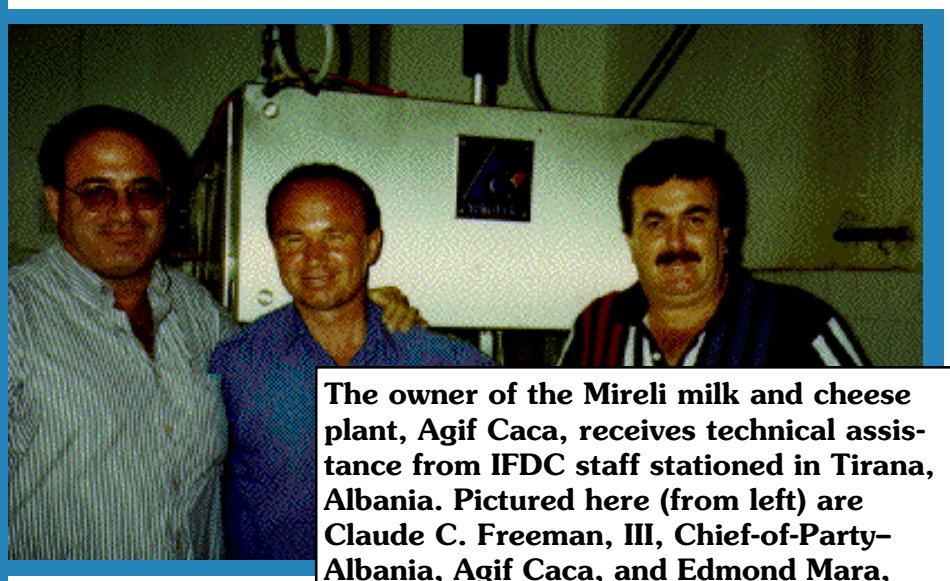
Albania's Ministry of Agriculture and Food has a clear concept of the impact of the project on Albania's agriculture sector during his country's most difficult period – the transition from a centralized economy to a free market economy. The project is viewed as having promoted in the private sector "clear-sharp models of potential success in agricultural development."

In the public sector, IFDC has contributed to the advancement of agricultural science in his country. "The laboratory that was installed in the Soil Science Institute, the gene bank, and the refurbished laboratory in the State Seeds Institute are contributions that will have a great impact on the future development of Albanian agriculture," a Ministry spokesperson states. "I think that IFDC's recent steps to support Albania's farmer associations, agribusinesses, and its agricultural



Agif Caca, Owner of Mireli Milk & Cheese Factory.

IFDC-Albania photo



The owner of the Mireli milk and cheese plant, Agif Caca, receives technical assistance from IFDC staff stationed in Tirana, Albania. Pictured here (from left) are Claude C. Freeman, III, Chief-of-Party–Albania, Agif Caca, and Edmond Mara, Director of Agribusiness Development Unit, Assistance to Albanian Agricultural Trade Associations (AAATA).

IFDC-Albania photo

publications are clear evidence of a project that aims to meet the challenges of the future."

One of the beneficiaries of the project is an experienced cheese maker, Agif Caca. Caca faced a difficult decision when the state-owned factory where he was employed closed at the demise of Albania's centrally planned economy. He could either escape to a possibly better life in Italy or stay and build a new life and business in the emerging free market economy. Using only a $350 inheritance from his father, Caca bought some bricks and mortar and built his own milk and cheese plant. With this meager startup capital, Caca began to build his business in the village of Synej in the Kavaje district of Albania; he constructed the building in stages, plowing his profits back into his business for plant expansion.

The young Mireli plant faced many difficulties, such as electric power interruptions and spoiled milk. With assistance from the staff of the IFDC-managed Agribusiness Center, the Mireli plant procured and installed a power generator and pasteurizer and purchased three new refrigerated trucks. The new equipment allowed Mireli to supply the market with fresh milk at the appropriate time and the amount the market requests. Since 1992 the Mireli factory has doubled in size and the amount of milk processed has increased from 500 liters/day to 10,000 liters/day. Today Mireli is the largest liquid milk supplier in Tirana and delivers to over 100 shops every day. The factory produces four dairy products: pasteurized milk, thin yogurt, curd, and soft white cheese.

"During the past few years of my activity, I have had to overcome several challenges such as organizing an efficient system to collect milk," Caca says. "My collection system is well established because of my reasonable price; the price I offer is higher than any price offered by other milk collectors. By doing so, I am providing the community with income of approximately 4 million lek/month (US $30,000/month)."

The Mireli firm's goal is to expand business to an extent that it will be able to process 15,000 liters of milk per day. The company's other goal is to improve the quality of the products that its customers receive.

"By installing a modern pasteurizing and cheese processing line, we believe that we can reach our goals," Caca says. "The demand for our products on the market increases continuously. Consumers are pleased with our products, and I believe that I have gained the confidence of both suppliers and storekeepers."

Most of the money from the Mireli plant is made from the sale of soft white cheese. Following a market-based, demand-driven strategy, the owner stockpiles cheese when milk production is high during spring and summer. During these months cheese prices in the marketplace are slightly lower. When the season changes and milk production is lower and dairy products in the marketplace demand a slightly higher price, the cheese that is held in reserve is sold out at the higher price. The business delivers and distributes the products on a wholesale basis to retail outlets, most of which are in Tirana.

"I have sought the advice of IFDC specialists based in Tirana to assist me in business plan development, in locating equipment suppliers, and in receiving quotations for the needed technology," Caca says. "The Agribusiness Center has provided me with technical assistance throughout the whole period since I started my business. They have advised me in selecting the most profitable products to manufacture. The Center has also helped me to find financing to purchase dairy equipment and provided me with information on machinery and equipment sources. The Center has supplied me with information on banks and other financial institutions and has helped me to develop a new accounting system."

With the help of the IFDC specialists, Mr. Caca's vision for the future will become reality – by the year 2000 he will be purchasing 15,000 liters of raw milk per day and producing a range of high-quality dairy products from this milk. He will be delivering fresh dairy products that are processed and packaged under high-quality standards. His dedication to quality products and excellence in customer service will position his company as a premier dairy processor and supplier in Albania.

Asia –

Dr. AMM Shawkat Ali, Secretary, Ministry of Agriculture, Government of Bangladesh, Assesses IFDC's Impact on His Country's Agriculture

Population experts predict that 200 million people will inhabit the country of Bangladesh early in the new millennium. When this milestone is reached, IFDC hopefully will be there to help ensure that sufficient food is being produced to meet the country's requirements.

Bangladesh – the site of IFDC's longest running partnership – is making rapid strides in agricultural development. With funding from USAID, IFDC began transferring technology in 1978 to increase that country's agricultural productivity. A 15-year project completely restructured the fertilizer sector and instituted a freely competitive marketing system, which created a network of 170,000 private entrepreneurs. The retail price of fertilizer was reduced, and fertilizer sales were increased. All fertilizer importation in Bangladesh is now handled by the private sector. In an evaluation of the Bangladesh project, USAID stated that the "program succeeded beyond expectations . . . .Privatization of fertilizer marketing and distribution significantly improved both employment and agricultural production. The improved fertilizer distribution system was an economic boon because it was part of a full, economically viable technical package that also included high-yielding rice varieties and improved irrigation. . . . As a result of the program, income increased US $600 million per year for paddy production and US $750 million per year for all crops."

"Cereal production (rice and wheat) is no longer a problem," says Dr. AMM Shawkat Ali, Secretary, Ministry of Agriculture. "About 20 years ago, our annual cereal production was about 9 million tons. Now it is more than 20 million tons. Fertilizers and methodology developed with IFDC's help aided us in increasing our production of rice."

"IFDC has played a very significant role in increasing agricultural production in Bangladesh," Dr. Ali says. "IFDC continues to provide new technology, such as urea

Secretary, Ministry of Agriculture, Government of Bangladesh, Dr. AMM Shawkat Ali (center), visits IFDC Headquarters. On the left is Dr. Amit H. Roy, IFDC President and Chief Executive Officer, and W. C. Brummitt, IFDC Consultant.

Photo by Jim Hannon, Times Daily, Florence, AL, U.S.A.

supergranules, to make the fertilizer sector more efficient and effective to meet our farmers' needs."

Dr. Ali appreciates the work that is being conducted by IFDC's newest Bangladesh Government project – the ATDP – a project that is being supported by USAID and the Government of Bangladesh. ATDP is a unique partnership of public, private, nongovernmental, and international donor organizations whose goal is to increase productive employment in agriculture and related business sectors. The project contributes to increasing food security for the poor by making food more available, accessible, and affordable. The project operates in eight program areas, namely, seeds and field crops, fertilizer, horticulture, agrimachinery, poultry, livestock, fisheries and agroprocessing. The project is promoting reforms in trade policy, industrial and agricultural policy, fiscal and commercial policy, foreign investment policy, and legal and regulatory practices in Bangladesh. Through the project, IFDC has assisted with the development of more than 7,000 new agribusiness investments in Bangladesh, having more than 46,000 new agribusiness employees.

"The ATDP Project is working very closely with the public and private sectors to promote agribusinesses," Dr. Ali says, "For the first time in history, Bangladesh was able to export potatoes to Sri Lanka, Singapore and Malaysia with the assistance of ATDP."

As of 1998, 112,900 farmers increased their incomes by using more productive, environmentally sound technologies. Technological advancement in agri-industry is being spurred through technical assistance, human resource development and business contracts. Advice on policy formulation and implementation is creating a more friendly environment for the country's agribusinesses.

Latin America –

Information and Decision Support Systems Aiding Decision Making in Uruguay

In recent years, IFDC's crop modelers have been developing IDSSs for several different countries in an attempt to develop systems that apply advanced technologies to analyze a vast volume of information but which can still be user friendly for all agricultural decision makers. IFDC's information systems use existing farm-level databases, results of previously conducted field experiments, remotely sensed data, applications of simulation models, automated land evaluation systems and Geographic Information Systems (GIS). The applications of these IDSSs result in drought alerts, crop yield forecasts, recommendations of optimal input use, evaluation of the sustainability of production systems, and crop zoning.

These IDSSs are excellent tools to apply the information being generated in climate forecasts associated with El Niño. An excellent example is the improvement of crop yield forecasts, which are very useful tools for agriculture-sector decision makers. When such forecasts are available to farmers before crops are planted, they can use the information to select crop and soil management practices that can reduce risks of financial losses or take advantage of favorable expected conditions. Government agencies can use crop production forecasts to manipulate national crop programs, anticipate expected food requirements, and estimate grain exports or imports. Finally, information on crop yield forecasts is very useful for agents in world grain trade and marketing.

Dr. Walter E. Baethgen, IFDC Soil Fertility/Biometrics Scientist, stationed in Uruguay, has been developing IDSSs for several Latin American countries for the past few years. One of the researchers with whom Baethgen has been collaborating is Dr. Agustin F. Gimenez, Head of the National Research Program (Summer and Oil Crops) of the National Agricultural Research Institute (INIA) of Uruguay. He also serves as the Research Coordinator of the Irrigation and Satellite Agriculture Group of INIA. Dr. Gimenez understands the important role that IDSSs can play in his country.

"For several decades many national research institutes in South America have been generating research results to achieve sustainable agricultural production by studying such factors as crop and soil management practices; pasture and livestock production technologies; crop, pasture and animal breeding; and integrated pest management," Gimenez says. "However, the proportion of this information that is currently being used by farmers and decision makers in the agriculture sector of the countries in the region is comparatively small. There are many different reasons for this. In some cases researchers are not stimulated to publish their results; in other cases, they publish in scientific journals that are not read by stakeholders. In addition, the agricultural extension services in most countries of the region have been drastically reduced. As a result, there is a large body of excellent information for the agriculture sector that remains unused in the research centers."

On the other hand, some of the information that is currently being demanded by stakeholders would need the simultaneous consideration of many production alternatives in long periods of experimentation,

which the individual countries cannot fund. But, there is a better solution.

"The IDSS that we are developing in collaboration with IFDC's office in Uruguay is an excellent answer to these challenges," Gimenez says. "First, it allows us to take full advantage of all the relevant research results previously and currently generated. The system uses modern information tools such as simulation models, land evaluation models, economical analyses, satellite information, and GIS. As a result we can now analyze vast amounts of complex information and produce results that are easily applicable. The system also allows us to obtain and update information much faster than we used to and with a higher degree of precision. The methods that we are using to develop the IDSS can be applied at different scales—from the country level to regions within the country to the farms themselves. Therefore, once fully developed the IDSS should be an excellent tool for planning and decision making at all these different levels in Uruguay's agriculture sector."

Stakeholders in Uruguay's agriculture sector have also begun to realize the value of using IDSSs in their work. A case in point is Alvaro Gomez-Haedo, Director of the Agronomy Division of MOSA, a private company – a member of the agribusiness sector of Uruguay. MOSA is part of a larger corporation that has activities in Argentina, Uruguay, Chile, Paraguay, and Bolivia. In Uruguay the company works with several dealers that sell fertilizer, seeds, and other agricultural inputs, and also directly with thousands of farmers in the southwestern and western regions of the country.

Dr. Walter E. Baethgen (right), IFDC Soil Fertility/Biometrics Scientist, stationed in Uruguay, confers with Dr. Agustin F. Gimenez, Head of the National Research Program (Summer and Oil Crops) of the National Agricultural Research Institute (INIA), Uruguay.

Photo by A. Vergara, INIA-Uruguay

"Twenty or more years ago stakeholders operating in the agriculture sector were typically limited by the availability of information," Gomez-Haedo says. "Only a small proportion of decision makers were able to develop effective channels to access the sources that were generating relevant information. Such decision makers presented a clear advantage over small farmers, government planners, and other stakeholders who were operating in poor regions and had limited ability to obtain research results and other important information such as prices and climate forecasts."

In the past few years this situation has changed dramatically. Today stakeholders are confronted with huge amounts of information through traditional channels such as publications and media and, more recently, through the Internet.

"The challenge has now become one of prioritizing the type of information to be considered and analyzing large and complex databases that are now available and effectively using this information to aid the decision making process," Gomez-Haldo says. "The Information and Decision Support Systems that IFDC is developing in collaboration with national institutes in our region are excellent responses to this challenge. These systems are using state-of-the-art methodologies to analyze very large databases, satellite information, and climate forecasts and producing results in the forms of maps that are easily understood by their users. We expect that the national research centers in this region will be able to use these IDSSs to evaluate production alternatives, perform risk analyses, evaluate the economical and environmental impact of different production activities, issue drought and flood alerts, and perform crop and pasture production forecasts. Working with the national research centers, we will now access this type of information to aid in the planning and decision making processes of government agencies, farmers, and private companies in the agriculture sector."

Latin America –

Peruvian Scientists Benefit From Crop Modeling Research Conducted in Their Country

Today NARS are facing a critical dilemma. While they are expected to help achieve sustainable growth in food production, they are also being asked to conduct research with dwindling resources. To meet this challenge, NARS scientists need to place a greater emphasis on the efficient organization of research and the knowledge that it generates. One way to obtain improved efficiency is through the integration of research activities with the construction and application of dynamic simulation models.

Following advances in computer technology and accessibility, models of soil and plant systems have become increasingly valuable instruments for assimilating knowledge gained from experimentation. Their use within a research program can increase efficiency by emphasizing process-based research rather than the study of site-specific net effects. Consequently, a modeling approach lends structure to a research program by helping to focus on the quantitative description of soil and plant processes. This information can then be used to predict how the system may respond to different environmental and management factors over time. A modeling approach also provides a dynamic, quantitative framework for multidisciplinary input.

If it is to increase the efficiency of research, the modeling process must become a truly integrated part of the research process. Experimentation and model development should proceed jointly; whereas, new knowledge is used to refine and improve models. Models are used to identify gaps in knowledge, thereby helping to establish research priorities. To be most effective, the modeling approach requires a regular evaluation of progress and continual refinement of objectives and priorities. It also requires a commitment to the development of software and data standards that facilitate a functional understanding of how soil and plant systems work.

Ms. Rocío Sánchez (left), a recent graduate of the University of Cajamarca, and Hector Cabrera, Coordinator of the Potato and Sweet Potato Program at the Cajamarca Station, examine a potato field experiment conducted for model evaluation.

CIP Photo

With the assistance of IFDC, one NARS that has begun to wed field experiments and modeling is the Peruvian National Institute for Agricultural Research (INIA – Instituto Nacional de Investigacion Agraria). Hector Cabrera, Coordinator of the Potato and Sweet Potato Program at the Cajamarca station (the station name is Baños del Inca) has

been collaborating with IFDC Systems Modeling Scientist, Dr. Walter T. Bowen, who is stationed at CIP. The two scientists are testing and improving the performance of the DSSAT potato model – SUBSTOR – for Andean conditions. Cabrera and Bowen are using computer simulation of plant growth and soil processes to understand better the interaction of weather, soil, plant, and management factors in Andean farming systems.

This research work in Peru is being funded by the Ecoregional Fund of the International Service for National Agricultural Research (ISNAR) and the USAID Soil Management Collaborative Research Support Program. Cabrera and Bowen are working with a multidisciplinary team to develop a computerized decision support system that helps to quantify the economic and environmental tradeoffs in agricultural systems. The decision support system integrates georeferenced information on soils and climate with the DSSAT crop models and econometric-based economic simulation models of land use and management decisions. This project has provided INIA and Cabrera with the support necessary to implement a systems research approach and facilitated training in the use of simulation models and the purchase of equipment such as weather stations and computers. The project has also provided funds for Cabrera to hire a recent graduate of the University of Cajamarca, Rocío Sánchez (Ing.), to assist in collating soil, climate, and experimental data and to assist in conducting field trials for model evaluation.

"Working with other scientists at the INIA Baños del Inca station, we have constructed a database of historical field experiments on potato, maize, and wheat," Cabrera says. "This database has been used primarily for model calibration and testing, but it has also helped our experiment station to organize better results from earlier experiments and make them easily available to all. During the 1998/99 growing season, we conducted a field experiment at a satellite station, Sulluscocha, to gather more detailed data for evaluating the potato model under different levels of applied nitrogen. Before conducting the experiment, an automatic weather station was installed at Sulluscocha. Prior to this project INIA did not have the funds to install weather- recording devices in the Sulluscocha station."

Cabrera's fellow researchers have followed closely his success in the use of the crop models and the construction of the Tradeoff Decision Support System. They have requested further training in the use of simulation models and already have begun to modify their field experiments to collect the minimum data sets needed for the critical evaluation and further development of the models.

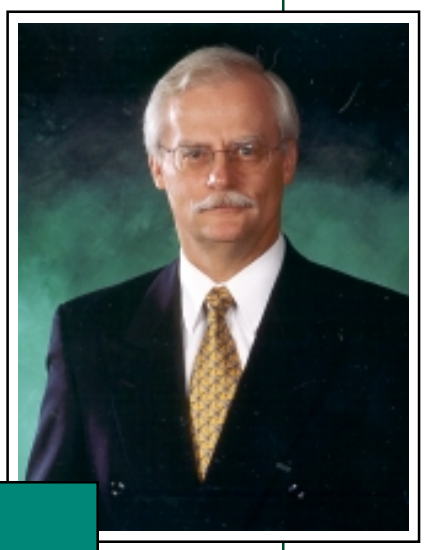
Continued experimentation and access to analysis tools such as crop simulation models are needed to secure the long-term productivity of Andean cropping systems. When pursued jointly, modeling and experimentation provide a powerful approach for improving our understanding of how biophysical, economic, and cultural forces interact to influence the sustainability of agricultural systems. NARS such as INIA stand to gain much from the improved efficiency in research facilitated through a systems research approach.

Latin America –

Venezuelan Fertilizer Company Gains Assistance in Marketing and Production

From September 1993 through December 1998, IFDC assisted the Fertilizer Business Unit (UNF) of PEQUIVEN, a wholly owned state company, after the elimination of subsidy programs by the Venezuelan Government, in taking the first steps in its transformation from a company operating in a subsidized market to one that is competitive in the marketplace. The UNF needed to establish an operating platform that would permit a rapid and efficient transformation from a production-oriented entity to a market-oriented one. In order to reach this goal, the UNF asked IFDC to jointly help prepare and implement an assistance program in marketing and production.

"IFDC's assistance program was very successful with tangible results in marketing, finance and production," says PEQUIVEN's UNF Director, Karl Mazeika. "The results obtained are a true measure of the great effort placed in teamwork by the PEQUIVEN and IFDC personnel involved in the 5-year project."



Karl Mazeika, PEQUIVEN'S UNF Director

PEQUIVEN photo

In marketing the UNF received the complementary knowledge to gain a better overview of the marketplace and implemented methods to serve and care for its customers and retain its market share. These can be summarized as follows:

- The motivational program for dealers "You Are Number One."
- PEQUIVEN's Dealer Conventions.
- The "Fund for Authorized Dealers."

"We were also able to improve the economic efficiency of the distribution system and of the dealer stock system," says Mazeika. "As a key element in all of this, we are implementing the computer management system to enable UNF to provide faster responses."

At the Morón Complex, UNF obtained the International Standards Organization (ISO)-9002 (quality) certification in its nitrogen products, improved the process control of the phosphate line, and improved the maintenance programs. The results obtained from PEQUIVEN'S team and IFDC's assistance can be summarized as:

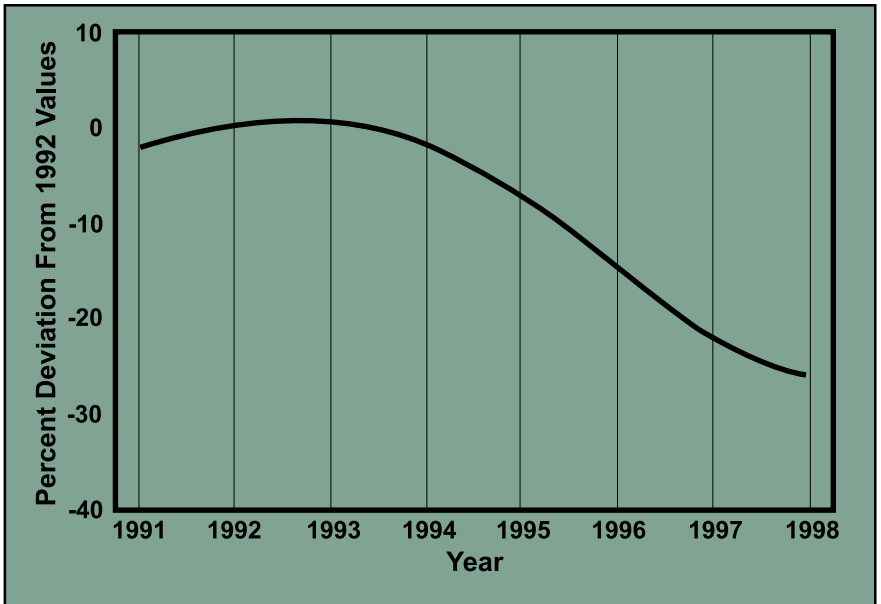
- A better stability in the production of phosphoric acid and improvement in its quality, leading to a 13% increase in production.
- Substitution of 100% of urea with ammonium sulfate in the production of NPK fertilizers representing quality improvement and an approximate 8% increase in its production.
- Improvement in operation control by establishing an On-the-Job Training Program for operators, leading to an increase in production of 4%.
- Implementation of Predictive and Preventive Maintenance programs in all the plants, with a 10% increase in plant operating time.
- Implementation of a cost control program at the production unit level.
- An increase in the total production level from 864,000 mt in 1993 to 1,250,000 mt in 1998, not considering the production of phosphate rock.
- A significant reduction in the unit production cost for NPK fertilizers when compared historically to the 1992 level. These cost reductions were 1% for 1991, 0% for 1992, 1% for 1993, 4% for

1994, -6% for 1995, -31% for 1996, -14% for 1997, and -21% for 1998.

At the El Tablazo Fertilizer Complex, the team implemented recommendations that improved production, product quality, and handling and storage operations of urea. Some results were as follows:

- Lower product moisture content through better operation control and improved formaldehyde addition, thus obtaining a good quality product.
- Implementation of a first-in, first-out operation mode with 30-day maximum storage time.
- Continuous operation of the warehouse climate control system.

"We are very pleased to have shared with IFDC the rewarding task of rescuing and relaunching a method of operation with an orientation toward the market and our clients," Mazeika says. The IFDC-PEQUIVEN partnership was responsible for fine-tuning operations, thus creating the conditions for obtaining higher levels of production, improved quality, and better understanding of the customers' needs and how to fill them. We sincerely hope that we can continue to count on IFDC's support in complying with PEQUIVEN's quality policy and mission and participating in the creation of conditions oriented toward the increased productivity of the Venezuelan agricultural community and related industry, always keeping in mind the provision of quality products and services.



Unit Production Cost for NPKs at PEQUIVEN's Morón Complex.

Africa –

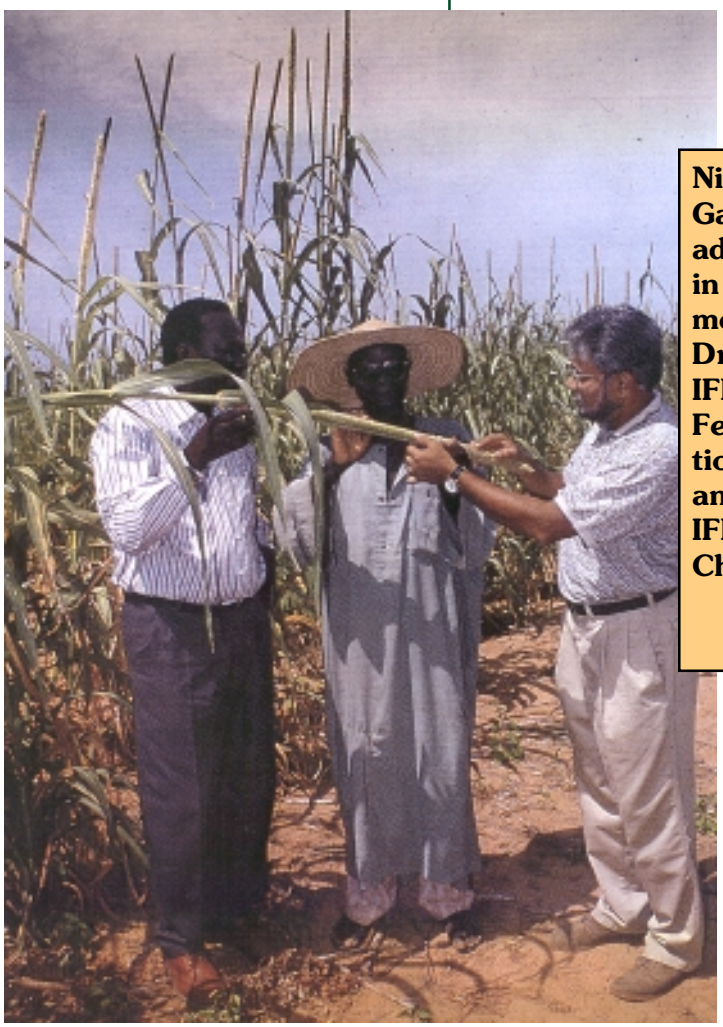
The Ground Beneath Our Feet

by Savitri Mohapatra, International Crops Research Institute for Semi-Arid Tropics (ICRISAT)

How sound is the ground beneath our feet? How long can it support us? How much food can it yield? How can we sustain or improve its quality? These are questions that don't bother most of us who buy our food from supermarkets. But they bother Dudu Garba and his neighbors, who are millet farmers in the village of Gobery, in Niger, because their lives and the lives of their families critically depend on the answers to such questions. The questions also bother scientists who are trying to find the answers. These scientists are participating in a joint project on dry savanna systems carried out in West Africa by IFDC and ICRISAT. Ultimately both the questions and answers affect us because Garba, his land, his millet crop, and we are closely bound by the earth's living chain.

However, the questions are not as simple as they look, nor the answers that scientists provide, for the earth is a complex and dynamic system and there are innumerable interrelated factors – including that of human intervention – that contribute to the quality of the earth. Agriculture is one of the primary human activities, which plays a dominant role in determining the quality of land, water, and biological resources – so sustainable farming systems are not only crucial for ensuring the world's food supply but also the quality of the global environment.

The semiarid tropics of West Africa where Gobery is situated are among the poorest regions in the world and are characterized by severe land degradation, poor soil fertility, and declining food production. The scientists of the joint IFDC/ICRISAT project realized that allowing these trends to continue would not only lead to an irreversible and permanent damage to the resource base but also push Garba and thousands of other farmers like him into the poverty and hunger trap, which is so common in this region.



Nigerien farmer, Dudu Garba, receives some advice from the experts in phosphorus management. From left is Dr. André M. Bationo, IFDC-Africa Senior Soil Fertility Scientist (stationed in Niger); Garba; and Dr. Amit H. Roy, IFDC President and Chief Executive Officer.

ICRISAT photo

Earlier, African farmers had sustainable ways of ensuring the nutritive balance of the soil. Their methods, such as fallowing and shifting cultivation, were sound and appropriate as long as there was

enough land to go around. But, because of the increase in human population, farmers have had to crop their land continuously, and levels of plant nutrients in the soil have fallen. In fact, many farmers in the region "mine" their soils by monocropping cereals year after year with little or no fertilizer. This has resulted in "reduced soil fertility, damaged soil structure, reduced water infiltration, and increased water and wind erosion," explained Dr. André Bationo, IFDC Senior Soil Fertility Scientist, one of the main researchers of the joint project. As soils become impoverished, farm yields and incomes drop. Smallholder farmers then find themselves sliding into poverty and hunger. This is a vicious cycle that seems relentless. But this need not be the case, as the scientists of the project show new ways for farmers to escape from this trap.

Scientists have found that the key nutrient for improving the fertility of this region's sandy soils is phosphorus and that the response of plants to nitrogen is substantial when both moisture and phosphorus are nonlimiting. "Land productivity can be more than doubled in the West African semiarid tropics once the soil fertility is restored," affirmed Bationo. Long-term experiments are being carried out on research stations and on farms to assess the extent of soil phosphorus deficiency, to estimate the phosphorus requirement of primary crops, and to evaluate the agronomic potential of various phosphate fertilizers, including the region's vast deposits of phosphate rocks. Scientists have observed that since changes in soil, water, and vegetation happen slowly and are not perceptible until it is too late, most people, including farmers, do not seem to be aware of the degradation processes, such as organic matter decline and associated changes in soil structure and nutrient depletion.

Most smallholder farmers in West Africa have little or no experience in using fertilizer. Asian farmers apply nearly 10 times more phosphorus to their crops than do African farmers – 15 kg/ha compared to 1.6 kg/ha. This situation is even more alarming when we realize that the overall agricultural production in this region must increase by 4% per year between now and 2020 to feed the growing population. Therefore, the productivity of the land under present cultivation must increase by at least 3% per year. More will have to be produced on less, and this will be impossible without better use of fertilizer.

Realizing that farmers like Garba will only believe what they see, the project scientists have carried out on-farm trials with farmers in villages of Niger in partnership with the Institut National de Recherches Agronomiques du Niger (INRAN). The results of this collaborative effort have been truly remarkable. In Gobery, for example, when the project began its on-farm research in 1984, only 30 farmers used fertilizers because the project had distributed them as part of a test package. By 1994 every farmer in the village was buying fertilizers.

Farmers also learned from the project that they need not depend solely on mineral fertilizers, which are expensive and can cause long-term problems if overused. They could introduce organic nutrients from crop residues and manure. Plowing in crop residues helps recycle nutrients, particularly phosphorus and potassium. Residues can give other such benefits as protection against wind and water erosion, loosening up of the soil surface, and a reduction in soil surface temperature.

However, with the recent devaluation of the CFA franc in West Africa, farmers are finding it extremely difficult to buy even the modest amount of 13 kg P/ha recommended by the project scientists for application. Commercial fertilizers are bought with scarce foreign exchange and are, therefore, beyond the reach of most farmers. "A bag of fertilizers that used to cost about 2,000 CFA (US $3.27) in the '80s now costs about 12,000 CFA (US $19.67)," said Bationo. The scientists had to find some way out of this problem, otherwise the farmers who had become convinced of the benefits of applying fertilizer would quickly become disenchanted and give up the practice altogether.

After trying several treatments, scientists from the University of Hohenheim, INRAN, and the IFDC/ICRISAT project, have arrived at a simple solution. They have found that only 4 kg P/ha placed in the seed hills with 13 kg Tahoua phosphate rock (found in the region) can double the grain yield (1,274 kg/ha) compared to the control treatment (651 kg/ha). The usual recommendation is 13 kg P/ha, which is applied by broadcasting. But the trick lies in precision placing of the fertilizer in the hill. This is a solution that will cheer up Garba and his friends who are caught between the imperative to apply fertilizers and the prohibitive cost. The mission of the project scientists is not over, however, as they continue to harness the best of science to creatively solve critical problems of the semiarid tropics.

Developing Human Resources for the New Millennium

Since its inception, IFDC has recognized that training is an investment in human capital, and the Center continues to devote a significant portion of its efforts toward the development of the human resources of developing countries. In recognition of the need for trained manpower by the developing-country fertilizer sectors, IFDC made a commitment to the task of contributing to training and developing professionals to work in all areas of the fertilizer sector and thereby overcome or at least relax the technology transfer constraints to fertilizer use.

IFDC and its training partners—the ministries of agriculture in developing countries, other international agricultural research centers, universities, nongovernmental organizations, and the commercial sector—are cognizant of the fact that the measure of success in training is how well people are trained and not how many people are trained. IFDC's trainers focus on providing information and skills that participants can use on the job. Therefore, IFDC is continually soliciting the advice of the beneficiaries of its training programs to improve the course content and implementation of its training curriculum.

The latest impact study of IFDC's training component revealed that the Center's training has helped about 52% of its participants in being promoted or changing jobs. Twenty-five percent of the respondents found

Dr. Paul Wilkens, IFDC Computer Programmer (upper photo) and Dr. Upendra Singh, Senior Soil Fertility Scientist (lower photo), assist training participants with a hands-on exercise during a program on computer simulation for crop growth and management responses, conducted in Lomé, Togo.

Photos by Dr. Thomas P. Thompson

that new ideas and problem identification and solving from training influenced job performance. Forty-seven percent stated that IFDC training materials are widely used as resource materials for training. On average, 41% of past participants indicated that they were responsible for training in their country and had trained 104 additional persons. Fifty-three percent were given additional work responsibilities as a result of IFDC training.

During the past quarter century of IFDC's training activities, many participants have expressed their opinions regarding the Center's training opportunities. For example, a fertilizer production manager with the Egyptian El Nasr Company for Chemical Industries stated that "after being equipped with the new technology and methods of fertilizer production, the managers from developing countries are better able to assume their responsibilities for the development and progress of both their companies and their people."

The Assistant Director of Agriculture of the Kenyan Ministry of Agriculture found a training program's discussions on soil testing to be very helpful in his work in Kenya especially since his country was in the process of establishing soil testing units at that time.

The Controller of Accounts for the Bangladesh Agricultural Development Corporation found his training experience to be quite beneficial. In fact, he mentioned that "after observing methods of fertilizer marketing in a developed country, we can apply these to our own situations in our countries." He emphasized the value of exposure to the experiences and ideas of participants from other countries. "The interaction with other participants can be very beneficial since I plan to apply their experiences to my situation," he said.

The head of Malawi's National Extension Service knows firsthand the value of training in developing an effective fertilizer sector. After attending an IFDC training program in fertilizer sector development, he stated that "the most important factor in agricultural development is marrying the agronomic potential of a crop variety with the economics of fertilizer application." During the program he learned how to determine the fertilizer requirements for the main food crops of Malawi—rice and maize.

The Exportation/Importation Manager for Fertilizantes Quimicos Dominicanos S.A. (FERQUIDO), Santo Domingo, Dominican Republic, attended an IFDC marketing program, after which she received promotions that carried with them increasing responsibilities. The FERQUIDO manager attributed the promotions to a variety of factors. "These changes occurred primarily because of skills that I obtained from experiences on the job, knowledge of our company, local training, institutional training and general knowledge of the fertilizer industry," she said. "The information and knowledge that I received from the IFDC training program are still very valuable in my career."

A senior executive director of Southern Petrochemical Industries Corporation of Chennai, India, reported that he experienced four changes in position after attending IFDC's fertilizer marketing program. He recognized that several factors accounted for the successes that he realized during his career. "Of particular importance are general managerial abilities, including a concern for people, delegation of power, a systems approach, and effective monitoring of cost," he said. "Primarily, I have developed my skills in several areas by reading and interacting with others. In all of the above areas, I have benefited from various training programs; the IFDC program that I attended was especially helpful to me in the area of problem solving."

A soil fertility specialist from Lahore, Pakistan, appreciated the opportunity to study at IFDC during a special training program. "Even if this information can give us only a little edge, it will allow us to achieve so much more in our home country; this training program will update our knowledge of the most advanced technology," he said. "The application of the innovations we were exposed to at IFDC will translate into increased yields in agricultural production in our country."

The widespread interest in IFDC's training programs strongly suggests that IFDC has identified training areas that are relevant to the global needs. In addition, these programs are fostering the desired development of a cadre of "change agents" who may be expected to be catalysts in improving the fertilizer sectors of developing countries. The task for the new millennium will be to improve upon and expand the present program base to better satisfy the unfulfilled needs of larger numbers of fertilizer and agribusiness personnel. This will be accomplished by improving the quality and depth of current program offerings, by increasing the frequency of these programs, and by developing new and innovative programs designed for specific groups and offered on an as-needed basis.

During 1998 IFDC conducted eight group training programs and nine special programs for 206 persons from 52 countries. Since 1974 the Center has trained 7,306 people from 150 countries.

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

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

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

FSR-11 *Worldwide Directory of Fertilizer Traders, Importers, and Organizations*.

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

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Financial Highlights

The following is a summary of financial information for the year ended December 31, 1998. The full financial statements and the independent auditors' reports are available from IFDC upon request.

Balance Sheet

For the year ended December 31, 1998

	US $'000
Assets:	
Cash and cash equivalents	1,102
Short-term investments	55
Contribution receivable	928
Contracts receivable, net of allowance allowance for doubtful accounts of $481,000	584
Other receivables	99
Supplies inventory	121
Prepaid expenses	41
Total current assets	2,930
Buildings and equipment, net	2,206
Contributions receivable, noncurrent	496
Total assets	5,632
Liability and Net Assets:	
Current portion of lease payable	19
Accounts payable	227
Accrued annual and sick leave	355
Deferred revenue	289
Total current liabilities	890
Lease payable, less current portion	40
Total liabilities	930
Unrestricted net assets	3,944
Temporariliy restricted	758
Total liabilities and net assets	5,632

Statement of Revenue and Expenses

For the year ended December 31, 1998

	US $'000
Revenue and Support:	
Bariven S.A./PDVSA Services, Inc.	154
Breed & McGill, Inc.	61
Bureau of Alcohol, Tobacco, and Firearms	460
Centro Internacional de Agricultura Tropical	112
The Citizens Network for Foreign Affairs	205
International Fertilizer Industry Association	116
International Fund for Agricultural Development	276
Government of Bangladesh/ Agribusiness Credit Fund	216
Netherlands Minister for Development Cooperation	884
Ocean Farming Inc.	84
Petroquimica de Venezuela S.A.	52
The Fertilizer Institute	151
The World Bank	18
U.S. Agency for International Development	6,026
Winrock International	172
Training Programs	228
Others	639
Total revenues and support	9,854
Expenses:	
Field programs	1,809
Research	1,689
Outreach	4,818
Support activities	2,078
Total expenses	10,394
Decrease in unrestricted net assets	(540)

IFDC's Revenue Sources

ASEAN Potash
U.S. Department of Treasury
Christmas Island Phosphates
Compagnie des Phosphates de GAFSA (CPG)
Bundesministerium für Wirtschaftliche Zusammenarbeit und Entwicklung of the Federal Republic of Germany (BMZ)
Entreprise Nationale de Fer et du Phosphate – Algeria (FERPHOS)
Haifa Chemicals
Haldor Topsoe
Instituto Agronomico do Parana (IAPAR)
International Center of Tropical Agriculture (CIAT)
International Fertilizer Industry Association (IFA)
International Fund for Agricultural Development (IFAD)
International Minerals Corporation (IMC)
Jordan Phosphates Mines, Ltd.
Manah, S. A.
Monómeros Colombo Venezolanos, S. A. (MONOMEROS)
Netherlands Minister for Development Cooperation
Ocean Farming, Inc.
Pengedar Bahan Pertanian Sds. Bhd. (PBP)
Petróleos de Venezuela, S.A. (PDVSA)
Petroquimica de Venezuela S.A. (PEQUIVEN)
Sasakawa Global 2000
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