

# IFDC Report

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*an update on  
the work & progress at the  
International Fertilizer Development Center*

**Economic Development  
in Eastern Europe**

## **Kosovo Project Gives Hope for Brighter Future**

**I**n the charred earth of Kosovo, IFDC is planting seeds of hope for a brighter tomorrow for that province's people. With funding from the U.S. Agency for International Development (USAID), IFDC has been working with nongovernmental organizations (NGOs) and other entities since mid-October 1999 to reconstruct the agribusiness sector and convert a state-run agricultural system into a competitive market system.

The Coordinator of IFDC's Agribusiness Program, Ian Gregory, gained a very favorable impression of the Kosovar people at the beginning of the Center's project in that province. "When I arrived in Kosovo in October 1999, I was struck by the atmosphere of extreme activity," Gregory says. "In fact, it was almost surreal; everybody was busy working and repairing their houses, making them ready for winter. The donor community was very active in supplying reconstruction materials, humanitarian aid, etc. Then the reality checks set in—the burned-out villages, the utter destruction of the infrastructure, particularly the homes in the rural areas."

Operating throughout the Kosovar province from an office in Pristina, Richard Hicks is serving as the project's Chief of Party. Hiqmet Demiri, an Albanian citizen, is responsible for technical and agronomic matters and trade associations. Short-term expatriate consultants are employed to assist with association development, grain marketing, and policy reform.

"There was a huge response by the global NGOs who were organizing relief aid, humanitarian aid, and some agricultural inputs for the Kosovo agricultural sector," Gregory says. "As a result of these efforts there were approximately 77,000 ha of wheat planted in September 1999. One must remember that this was after the return of the refugees from the surrounding countries only in the middle of June 1999. This was a remarkable effort all around, both by the Kosovar farmers and by the NGO relief organizations. Unfortunately, the kind of humanitarian aid programs that supply seed and fertilizer for free to farmers disrupt the commercial market for the private sector. Unlike in Albania, in Kosovo there was an extensive network of agricultural input suppliers, which have developed over the past decade as the Serbian authorities eliminated the ethnic-Albanian Kosovars from the official channels of trade."

"Prior to the conflict, agriculture accounted for about 35% of the gross domestic product of Kosovo," Gregory says. "At the end of 2000, that figure will probably be as high as 50%. Each farm family averages about 10 people, and there are about 120,000 farms."

The main crops grown by Kosovar farmers are wheat and maize, with approximately 100,000 ha of wheat and 100,000 ha of maize being planted annually. In addition, there are another 100,000 ha of minor crops (forage for livestock); 26,000 ha are planted in fruits and vegetables.



Workers plant seeds at a demonstration site 10 km north of Pristina, Kosovo.

*(IFDC-Kosovo Photo)*

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## IFDC Report

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## Message From IFDC's President and Chief Executive Officer

**Editor:** Dr. Roy, as the year 2000 begins, what do you consider to be IFDC's greatest challenge in the 21<sup>st</sup> century?

**Dr. Roy:** "IFDC's greatest challenge must be considered in the context of the greatest challenge that human beings face in the 21<sup>st</sup> century. That challenge is how to feed the growing population of the world and at the same time preserve and maintain the natural resources on which we depend, especially soil. IFDC realizes that it has a vital role in restoring, to the soil, nutrients that are so vital for increasing productivity of the land. IFDC's greatest strength in this regard is that we not only find the right technology to research but also work with the beneficiaries of these technologies to determine how they can be adopted in their environment. In summary, the greatest challenge of IFDC is to ensure that our natural resource base, especially soil, is preserved and yet is used to double food production, which will be required during the next 25-30 years."

**Editor:** The President of the Rockefeller Foundation—Dr. Gordon Conway—has stated that "We're going to need two approaches to feed the more than 2 billion additional mouths by 2020—an ecologically sound agriculture and biotechnology." Does IFDC hold the key to these approaches and why?



**Dr. Roy:** "IFDC has a very important role to play in both these approaches, particularly in the first approach—ecologically sound agriculture. This is especially important in a fragile environment such as in Africa. In most of Africa the soils are inherently very low in nutrients, and the productivity of the land is progressively declining because of the absence of soil management. One area that is of concern to us is the rate at which the nutrients are removed from the soil. However, the intensive agricultural system that was used in the 60s and 70s in Asia to increase food production has proven that there are environmental and sustainability issues that need to be addressed when we intensify agriculture. In this regard we must consider the organic matter status of the soil, how to maintain that status, and how to increase the productivity in such a way that the natural fertility of the soil is improved and the soil itself is preserved for future generations. The other issue related to ecological agriculture is that we need to use the nutrients that are applied to the soil to their maximum potential—that is uptake by the plant with minimum

losses to air or water. This is particularly important in places where fertilizer application rates are relatively high. In this regard, IFDC also has to consider the nutrients of waste materials generated in urban centers and how these materials can be recycled back into the soil, paying particular attention to heavy metal contents, which are also derived from fertilizers containing phosphates and micronutrients."

"In terms of biotechnology, there are two avenues of research conducted in the private sector—to genetically alter the plants so that they will selectively absorb certain nutrients or to increase their resistance to disease. However, if biotechnology is to be really effective, the crop still must have nutrients to realize the full potential, and this is where IFDC has a role to play, especially with the new varieties that are being developed today. For example, some cereal varieties today have a higher uptake efficiency of zinc and iron, which today are quite deficient in many parts of the developing world. However, for the plants to take up these nutrients, fertilizer must be applied to the soil. Thus, IFDC has a role to ensure that biotechnology research reaches its full potential."

**Editor:** Dr. Norman Borlaug has said that "World peace will not be built on empty stomachs." How is IFDC contributing to world peace in this regard?

**Dr. Roy:** "IFDC has been able to improve nutrient management in the trop-

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ics and subtropics. As a result, the production costs for cereals and food have progressively declined, which has allowed, first of all, the improvement of yields in the developing countries and also has contributed to reducing the cost of food for poor people. In other words, poor people today have a greater access to food and, thus, are increasingly more able to feed themselves. However, because there are more than 800 million people who are still malnourished, alleviating poverty of rural and urban population remains a challenge for the international community."

**Editor:** Former President Jimmy Carter has commented that "An often overlooked path to peace is to raise the standard of living of the millions in poverty by increasing agricultural productivity. Not only does agriculture put food on the table, but it also provides jobs, both on and off the farm, which raise incomes. Thriving agriculture is the engine that fuels broader economic growth and development, thus paving the way for prosperity and peace." What can IFDC achieve (or has it achieved) in your estimation to "fuel broader economic growth" in Albania and Kosovo, for example?

**Dr. Roy:** "Most of our activities today, especially those related to development such as in Albania and Kosovo, are on the broader scale directed toward economic growth. We strongly believe that economic growth is the way to improve the lives of people in developing countries and transitional economies. In most of the devel-

oping countries and East European countries such as Albania and Kosovo, agriculture is one of the mainstays; it contributes between 30%-40% to the gross domestic product. Seventy percent of the population is engaged in some form of agriculture. In Albania we first concentrated on development of private enterprise, initially dealing with fertilizers. Subsequently, we expanded to other inputs and later on to the entire agribusiness sector. This development of agriculture has been one of the main achievements of IFDC in Albania. In Albania over the past 7 years, the overall growth of the economy has averaged 4%-5%; whereas, the growth of the agriculture sector was 7%-8%. This growth has created, as President Carter

has said, employment for people both on and off the farms and given most of the people engaged in agriculture the opportunity to generate extra revenue that has increased their prosperity. We strongly believe that economic growth is the avenue for development in most of these countries."

**Editor:** What new initiatives do you have on the drawing board for IFDC in the 21<sup>st</sup> century?

**Dr. Roy:** "It is important to remember that IFDC is both a research and development institution, and our strength comes from the fact that we can translate our research findings into a development agenda. During the 21<sup>st</sup> century, development will be much more important, especially regarding economic devel-

opment. Today with the globalization and freer trade that is occurring, many of the developing countries will need assistance in adjusting to the new realities of the global trade agreement by the World Trade Alliance. We have the knowledge and understanding to play a very significant role in helping developing countries make this transition. At the same time, IFDC must identify new sources of plant nutrients and improved products that are environmentally benign, improve the energy efficiency of fertilizer production, and continue to work toward better nutrient management for improving agricultural productivity where a component of ecological agriculture is also factored into the development process."



Lawrence L. Hammond

## R&D at IFDC—Beyond 2000 New Director Guides Research Toward New Horizons

"Research has demonstrated that potential crop yields, even under very difficult environmental constraints, are much higher using existing knowledge than those yields that farmers are actually averaging under practical conditions," says IFDC's new R & D Director. "We need to close the gap between farmers' actual yields and the potential yields by facilitating adoption of improved technologies that are already available."

In February 2000, Dr. Lawrence L. Hammond joined IFDC as Director of the Research and Development Division. He previ-

ously worked at IFDC during 1977-89; during that period he served as Soil Scientist and Director of the Agro-Economic Division. Dr. Hammond most recently served as International Agronomist with the Potash Corporation of Saskatchewan (PCS). At PCS he was responsible for coordination of international agronomic research programs in collaboration with national and international research organizations and for technical assistance to distributors and farmers regarding fertilizer use and management.

"The most pressing focus area for IFDC will be Africa because of the low level of

fertilizer use, low crop productivity, and poor economic conditions of the region," Hammond says. "However, we will not abandon work in Latin America or Asia. Some of the research findings that we are obtaining in Latin America may prove valuable in developing management practices not only in Latin America but also in Africa. For example, the climatic and crop growth simulation models, which are developed to assess the expected results of employing various fertilizer technologies, should soon be tested in

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## Seven Bangladeshi Scientists Visit IFDC for Agronomic Training

Dr. A. T. M. Farid, Principal Scientific Officer, Bangladesh Agricultural Research Institute (BARI), and Ms. Sultana Razia, Principal Scientific Officer, Bangladesh Agricultural Research Council (BARC), both realized their objectives in participating in an 8-week IFDC agronomic training program recently. They were among six Bangladeshi scientists who visited IFDC to enhance their knowledge on a variety of agronomic subjects.

"IFDC has been involved in Bangladesh agriculture for the past 22 years," Razia says. "We were very familiar with IFDC's work in our country and wanted to come here and participate in this training program to learn more about crop modeling, for example. We are very happy with the outcome; we have had intensive training and participated in field visits to universities, laboratories, and fertilizer companies."

"In our country we are intensively producing crops; therefore, our soils are depleted of nutrients," Dr. Farid says. "Fertilizer is a key input to crop production. Our farmers must learn to apply fertilizers efficiently, and IFDC is the most appropriate institution to train us in this regard. It can be equally effective for IFDC staff to visit Bangladesh to train large numbers of our people."

Prior to arriving at IFDC the Bangladeshi scientists were well aware of the contributions that the Center has made to their country's agriculture sector. "Through extension even Bangladesh farmers know of IFDC," Razia says. "In many spheres IFDC is well known—through research, extension, and the Government."

According to Farid IFDC has had an influence on his work since 1985. "At that time, Dr. Ray B. Diamond, IFDC Agribusiness Specialist, organized a workshop on nitrogen use efficiency; the document that resulted from that meeting has been used by all Bangladesh research officials," he says.

As for the impact of IFDC on the Bangladesh economy, Razia had this to say: "Because of IFDC's influence, today there are more fertilizer dealers in Bangladesh; the fertilizer price has been reduced; and fertilizer use has increased. More than 170,000 private entrepreneurs were developed through IFDC assistance. Today through the Agro-Based Industries and Technology Development Project, IFDC is working closely with the public to promote fertilizer use, and 700,000 new entrepreneurs have gained their wings. As to IFDC's impact on crop yields, we were producing 9 million tons of cereals per year 20 years ago; today we are producing 20 million tons per year. IFDC has played an important role in these advances."

According to Farid, the improved fertilizer use has increased the gross domestic product and through that the Bangladesh economy has been positively affected. He believes that IFDC will continue to play an important role in his country's future. "We need IFDC to continue to help us increase fertilizer use and produce more food for our people. In the future we will have new agricultural-related problems to solve in Bangladesh; IFDC scientists can help us to solve these problems," he says.

The scientists plan to disseminate the information that they acquired at IFDC to their colleagues in Bangladesh. "We will train our junior scientists and extension officials in the latest crop modeling and statistical design methods, with which we became more familiar," Farid says.



Pictured from left to right: Dr. M. Quamrul Haque, Dr. A.T.M. Farid, Dr. M. Shahabuddin Khan, Ms. Sultana Razia, Dr. Pranesh Kumar Saha, and Dr. Amit H. Roy. Not pictured is Dr. Md. Kabir Hossain Talukder.

## IFDC Helps Develop an Action Plan for Creating Sustainable Input Supply Systems in Malawi

The Malawi Agricultural Sector Investment Programme (MASIP) Secretariat, Ministry of Agriculture and Irrigation (MAI), Government of Malawi, recently requested that IFDC conduct a study on agricultural input supply systems in Malawi. The study was conducted in collaboration with Development Alternatives Incorporated (DAI), Bethesda, Maryland, U. S. A. and Masdar Technology Limited (MTL), Eversley Hampshire, U. K. The study developed an assessment of the prevailing input supply systems in Malawi and prepared an action plan for their sustainability. The funding for the study was provided by the Department for International Development (DFID), European Union (EU), United States Agency for International Development (USAID), and the World Bank. Balu L. Bumb, IFDC Senior Policy Economist, led the study team, which also included seven other professionals from the participating institutions.

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# Natural Resource Management

## Visiting Scientist from India Creates Decision Support Toolbox



A visiting scientist from Indira Gandhi Agricultural University in Raipur, India—Dr. Sanjay K. Patil—completed an 8-month visit to IFDC in late 1999. During his stay at Headquarters, Patil developed an Integrated Decision Support Toolbox (IDST) for the rainfed lowland of the Chhattisgarh Region of India. The toolbox delineates suitable areas for wet and dry season cropping, estimates crop nutrient requirements, and identifies current yield gaps. Patil's work at IFDC was conducted as part of the Better Opportunity for Young Scientists in Chosen Areas of Science and Technology (BOYSCAST) fellowship program, which is sponsored by the Department of Science and Technology of India.

Patil's work concentrated on using decision support systems to manage the soils in the Chhattisgarh region of southeast India. Chhattisgarh is located in a principally rainfed rice-growing region, where the average rice yield is 1.2 t/ha, and only 26 kg/ha of fertilizer is used. The area's soils are deficient in nitrogen, phos-

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The study identified several constraints to the functioning of the input markets in Malawi. These constraints include, but are not limited to, policy uncertainty, devaluation of currency, inadequate availability of foreign exchange and finance, high interest rates, lack of human capital and market information, poor roads, and physical insecurity in rural areas. Even though they recommended measures to alleviate these constraints, the study team recognized the latent potential of the private sector in supplying agricultural inputs and recommended the development of the private sector-based free market system to ensure its efficiency and

phorus, and zinc and have a low organic matter content. Because of these characteristics, poor recoveries from applied nutrients result. The per capita income for the region is less than US \$50.00 per month.

After Dr. Upendra Singh, IFDC Senior Systems Modeling Scientist, visited the Indira Gandhi Agricultural University (IGAU) in 1994/95, he and Patil began collaborative research on nitrogen/phosphorus management in rice-cropping systems in India. During that project Patil realized the potential of crop simulation models in natural resource management. He later applied for and received a fellowship with the Department of Science and Technology, which allowed him to come to IFDC and work with Dr. Singh. The fellowship also provided funds for Patil to return to India and continue his work on crop simulation modeling.

"While I was at IFDC, we developed a decision support tool box, refined the tool box, and fine tuned it for my specific district," Patil says. "This system has provided the basis to integrate information on soil and climatic conditions and to select the best management practices for my region of India."

Patil and his collaborators at IFDC created soil and weather data bases of Chhattisgarh. The information was linked to a crop model and Geographic Information System (GIS); spatial soil thematic maps were prepared on soil pH, depth, texture, erosion, slope, drainage, mineralogy, and parent material. Yield potentials under irrigated and rainfed conditions were estimated using validated crop models and soil and weather data bases for rice, wheat, and maize. Simulations were completed for a period of 20 years using historical and generated weather data. The yield gap analyses with actual yields can be helpful in decision making related to crop production and fertilizer use. The Decision Support System that was developed can be used for identification of the favorable areas for cropping in the wet and dry seasons. Estimation of the total nutrient requirements was based on the yield potentials of rice, wheat, and maize.

IFDC and IGAU are preparing a joint publication entitled *Development of an Integrated Decision Support Toolbox for Nutrient Management in Chhattisgarh, India: Soil, Climate and Crop Database*, which should be available by July 2000.

sustainability without straining the fiscal resources of the country.

To promote the development of a free market system for input supply, the action plan calls for a holistic approach. Such an approach should concurrently focus, with an appropriate prioritization, on policy reforms, human capital formation, technology transfer, improved financial services, market information system development, and regulatory frameworks. The plan also recommends that the targeted input support to the poorest of the farmers be implemented through market-friendly measures.

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To help the Kosovar farmers prepare for this spring's planting season (2000), IFDC identified the demand for inputs—fertilizers, seeds, and crop protection chemicals—and then determined how much the donor organizations will be providing for free to selected Kosovar farmers. The results of IFDC's studies reveal that about US \$40 million worth of agricultural inputs are required and of this, about US \$10 million or 25% will be provided by the donor organizations to approximately 70,000 of the most deserving farm households in Kosovo. The private sector has the capacity to supply another US \$20 million worth of inputs on a commercial basis. However, a gap of US \$10 million still exists, and this could be a serious constraint on the amount of planting in the spring.

**In spite of these constraints, IFDC has accomplished much in a very short time.**

"We have established three trade associations thus far," Gregory says. "These include the Kosovo Dealers and Agri-Inputs Association (KODAA), the Kosovo Flour Millers Association, and the Kosovo Poultry and Feed Association. KODAA now has approximately 150 members—retailers and major importers of agri-inputs. The Flour Millers Association consists of 50 private sector mills, plus some public sector flour mills. The Poultry and Feed Mills Association has recently been registered. In addition to these trade associations, several producer associations are being established by other organizations in Kosovo;

one of the most important ones to date has been the vegetable producers' association. The primary advantage of trade associations is that members can share information and be better informed on product technology and markets. This benefits their farmer customers."

**IFDC is making progress in assisting Kosovo in the development of markets for farmers to sell their products.** "IFDC has already surveyed private sector flour mills and feed mills," Gregory says. "There are about 50 private sector flour mills that have the capacity to supply all of the flour required by Kosovo. In addition, there are 17 public sector flour mills that have a capacity similar to that of the private sector. All of these flour mills, both public and private, are suffering from three primary constraints: lack of wheat, frequent interruptions of electricity to power the mills, and lack of credit to buy the raw material. IFDC is working with the flour mills to form a trade association and also on a proposal to import wheat rather than flour to allow these private sector mills to become fully operational. The United Nations Mission in Kosovo (UNMIK) is working to restore the electricity supplies."

Besides the flour mills there are some milk processing plants and one fruit and vegetable processing plant that is not in operation. IFDC is studying the requirements for starting up that plant because we expect an overabundance of fruits and vegetables this summer.

"One of the main drawbacks in Kosovo was the

absence of a banking system during the past decade," Gregory says. "UNMIK proclaimed new banking laws in December 1999. The European Union and other donors have established a micro-enterprise bank that has a small agricultural portfolio. Currently there are only three branches of this bank open. In collaboration with the Catholic Organization for Relief and Development Aid (CORDAID)—the largest Dutch NGO, IFDC is in the process of establishing a rural bank, based on agribusiness trade associations, to provide full banking services. IFDC is planning to assist CORDAID in providing technical assistance to its customers who are members of agribusiness trade associations. During the next year we expect to see several more banking and financial institutions established."

**As for IFDC's future work in Kosovo, it will focus on policy development that is conducive to private sector development, the further development of trade associations and new trade contacts for these associations, for both agricultural input and output markets.** The Center also looks forward to the development of linkages between the Agriculture Department at the University of Pristina and the private sector input dealers to provide private sector extension services for farmers. IFDC recognizes that one of the crucial links in the development chain is the training of Kosovar agribusiness entrepreneurs in financial and business planning, marketing, and other activities as their businesses develop.

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Africa even though climatic data are not readily available. By using correlations between climatic variables and crop growth in Latin America, we should be able to make similar types of predictions in Africa."

Because of Hammond's 10 years' experience with the fertilizer industry, he has a broadened perspective of research and development. "Commercial fertilizer producers and distributors have a great impact on the selection and management of materials because they are in direct contact with the end users," he says. "It is to everyone's benefit to ensure that the latest information is available to the farmers. By enhancing our communication with the fertilizer industry, we will be aware of problems that they are observing with their customers, and they will be aware of new advances that are being developed in other parts of the world. It is no longer sufficient to conduct research and publish the results in scientific journals and assume that those results will be read and utilized. We must actively convey the information to the industry and extension organizations."

Several priority areas will command the attention of research and development in the future. "Using products that provide balanced nutrition to crops is not a new concept, but in practice the ratio between nitrogen, phosphorus, and potassium of the products that farmers are actually using is not balanced," Hammond says. "We must overcome this problem. Additionally, very little adoption of micronutrients has

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## Integrated Soil Fertility Management Provides Option for Sub-Saharan Africa Farmers

**T**ogo is one of the world's poorest countries. Its average per capita income is less than one U.S. dollar a day. Marbau and Kisseem and their five children farm three hectares of land, passed down from their ancestors, near the village of Afem Kabye, in central Togo. For centuries their ancestors cleared a few hectares of land, grew a few crops, and then later moved on to clear more land. They then left the land fallow for several years so that the soil could regain its fertility. Slash-and-burn farming was fairly sustainable when land was plentiful and people were few. But population across Africa is increasing about 3% per year. The soil can no longer rest; it must feed too many people. It is farmed continuously year after year. Each crop produces less than before, while removing the soil nutrients—food for the plants—that are left. It is a vicious cycle of poverty—soil poverty that leads to human poverty, which forces Marbau and Kisseem to “mine” the soil of its life-giving nutrients, yet giving nothing back.

Researchers at IFDC and other international agricultural research centers (IARCs) have developed

technologies that enable small-holder farmers, like Marbau and Kisseem, under marginal conditions to use mineral fertilizer and to improve production levels and revenues while reversing nutrient depletion. This technology is based on the combined use of local resources and inorganic fertilizer and leads in time to more favorable cost: benefit ratios for mineral fertilizer use because of an improved nutrient and water-holding capacity of the soil.

**“Integrated soil fertility management can reverse the downward spiral of soil fertility,” says Dr. Henk Breman, Director of IFDC-Africa.** “Through improvement in soil quality, the efficiencies of plant nutrients, water, and la-

bor can be significantly increased. The combined use of mineral fertilizer and the locally available source of organic matter improves the amount and the quality of soil organic matter or humus that is crucial for higher nutrient and water storage in the soil and for the efficiency of their use. Results from long-term experiments in the coastal savanna of Togo show the synergistic effects of organic/manure and mineral fertilizers. This combined use also improves phosphorus availability and corrects soil acidity over time. Good agricultural practices, erosion control, improved crop and livestock varieties, diversification, etc., may be required as complementary measures.”

Mineral fertilizers play a dual role in integrated soil fertility management; they stimulate plant growth and improve soil quality. Technically and economically, the best way to achieve this goal is by combining elements of ecological agriculture with fertilizer use. Five options are possible. First, with an increase in the use of fertilizers, better and higher amounts of crop byproducts become available for recycling that leads to a better quality and quantity of organic matter. Second, the rotation of cereals with leguminous crops like beans, cow peas, and groundnuts, fertilized with phosphate fertilizers, improves soil organic matter, which in turn makes the application of

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*(Photos by Dr. Thomas R. Hargrove)*



**Togolese farmers—Marbau and Kisseem—till the earth to make a living for their family.**

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occurred; this situation should be rectified. Environmental issues relating to fertilizer products and management practices need to receive greater attention. The best management of the combined use of organic and inorganic fertilizers is another area that should be addressed. We also need to take advantage of the new information technologies such as the Internet as a way of making information available to agriculturalists and farmers.”

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other fertilizers on cereals profitable. Third, the fields are enriched with organic matter from elsewhere in the form of compost or animal manure. Fourth, the amount and the quality of manure can be increased by improving the quality and quantity of fodder for livestock; in a crop-livestock system, pastures of perennial grasses can be used in rotation with crops. Fifth, shrubs or trees are introduced in crop production systems to obtain more plant biomass for recycling and, thus, improve fertilizer use on crops.

“It cannot be stressed enough that, in all of these cases, organic matter is not used as an alternative to fertilizer but as a soil amendment that leads to a higher response to fertilizer use,” comments Dr. Amit H. Roy, IFDC’s President and CEO. “This management practice is ‘better’ in view of the higher efficiency and more favorable cost: benefit ratios and in view of decreased losses of nutrients to the environment.”

According to Breman, mineral fertilizer use is absolutely essential in reversing the negative trend of soil nutrient depletion in sub-Saharan Africa (SSA) and arresting the degradation of natural resources and the social fabric that is causing desertification and rural-urban migration. However, except for a few favorable regions and high-valued crops, the cost : benefit ratio of fertilizer use does not provide an incentive to farmers. Integrated soil fertility management makes the cost : benefit ratio more attractive through higher fertilizer-use efficiency and lower environmental risk. During the initial period of adoption of integrated soil fertility management technologies, the support of governments and/or donors is vital because of the predominance of small-holder farmers and marginal lands in sub-Saharan Africa.