

Integrating Natural Resource Management and Agriculture

TITLE XII
Report to Congress
Fiscal Year 2002

USAID
United States Agency for
International Development

INTEGRATING NATURAL RESOURCE MANAGEMENT AND AGRICULTURE

FY 2002 Report to Congress on Title XII, Famine Prevention and Freedom from Hunger, of the Foreign Assistance Act of 1961

QUOTE FROM ANDREW S. NATSIOS, ADMINISTRATOR, USAID

Before the Subcommittee on Foreign Operations, Committee on Appropriations
US House of Representatives, April 9, 2003



“For many poor countries with largely rural societies, agriculture connects poor people to economic growth. A vibrant and competitive agricultural and business sector fosters growth. And a supportive policy and institutional enabling environment encourages enterprise, innovation, and competitiveness.”

“Agricultural development remains a critical element of USAID’s approach to economic growth and poverty reduction. Most of the world’s poorest and most vulnerable populations live in rural areas and depend on agriculture.”

“Environmental degradation is an increasing threat to long-term development with severe effects on health, trade, and poverty reduction efforts in general. Effects can be felt directly in the United States, as in the case of climate change. It is in our interest to ensure that policies and institutions actually support sustainable development. USAID’s efforts will focus on four initiatives:

- *Water for the Poor,*
- *Clean Energy,*
- *The Congo Basin Forest Partnership, and*
- *Global Climate Change, as well as ongoing programs in natural resource management, forestry, reducing illegal logging, and minimizing pollution.”*

TRANSMITTAL LETTER BY ANDREWS NATSIOS, ADMINISTRATOR

I am pleased to present the FY 2002 Title XII Report, entitled Integrating Natural Resource Management and Agriculture. This report provides an opportunity to communicate the many accomplishments of USAID and our public and private partners during FY 2002, as well as examine the themes of USAID's new agriculture strategy and describe the new organizational structure of USAID as it affects our agricultural agenda.

USAID's new agriculture strategy is guided by the principles of good governance, sustainability and adaptive management, expanded public and private sector alliances, and effective knowledge management. Its four main objectives are: to expand global and domestic trade opportunities and improve the capacity of farmers and rural industries to act on them; to promote sustainable agriculture; to mobilize science and technology and foster a capacity for innovation to reduce poverty and hunger; and to bridge the knowledge divide through training and education, outreach, and adaptive research. In this report, we examine USAID's past and present activities as well as future plans for promoting sustainable agriculture by focusing on the integration of natural resource management and agriculture.

The reorganization of USAID was completed in FY 2002. The new Bureau for Economic Growth, Agriculture, and Trade serves as home for the Agency's technical expertise in agriculture and natural resource management. The Bureau's goals are to raise incomes, end hunger, protect the environment, and equip institutions and people with the knowledge and skills to build equitable and sustainable economies and societies. A viable agricultural sector is critical to meeting these goals. The new Bureau for Democracy, Conflict, and Humanitarian Assistance designs agricultural programs to improve food security and support agricultural recovery following natural or man-made disasters. Finally, agriculture programs are also initiated and funded through country missions and regional bureaus in sub-Saharan Africa, Asia and the Near East, Europe and Eurasia, and Latin America and the Caribbean.

At the World Food Summit in 2002, the United States pledged to participate in international efforts to cut hunger in half by 2015. USAID will do its part in this effort, drawing upon the strengths of its public and private partners, including U.S. universities, and addressing the constraints agriculture faces in developing countries. Title XII of the Foreign Assistance Act of 1961, as amended, is designed to engage the U.S. land-grant institutions in international efforts such as these. Increasing agricultural productivity, harnessing new technology, improving distribution and markets, and wisely managing the natural resources upon which agriculture depends continue to be critical components of USAID's approach to reducing hunger and supporting sustainable development.

After many years, agriculture is again becoming a major component of USAID's development assistance. I look forward to sharing with you in the next Title XII report our continued progress in addressing the challenges of agricultural development around the world.

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EXECUTIVE SUMMARY

This report summarizes the implementation of Title XII of the Foreign Assistance Act by the U.S. Agency for International Development (USAID) in FY 2002. USAID's agricultural activities are guided by the priorities outlined in four key documents: the Title XII legislation, the U.S. Action Plan on Food Security, the respective bureaus' and missions' strategic plans, and the interim agriculture strategy. The main body of this report highlights those activities of USAID and its Title XII partners that contributed to USAID's fourth strategic theme of the interim agriculture strategy: promoting sustainable agriculture and sound environmental management. It examines the history of USAID's integration of natural resource management and agriculture, the lessons learned, accomplishments of current programs, and future directions for the integration of natural resource management goals into USAID's agriculture strategy. The report annexes describe financial obligations and program accomplishments in agriculture.

During FY 2002, USAID invested approximately \$420 million in activities that addressed the objectives of the Title XII legislation. In agricultural research and training, USAID's major implementing partners were the Collaborative Research Support Programs (CRSPs), which mobilized the resources and expertise of more than 50 U.S. universities and their counterparts in developing countries, and the 16 International Agricultural Research Centers (IARCs) supported by the Consultative Group on International Agricultural Research (CGIAR). In FY 2002, USAID launched several new initiatives designed to reduce poverty by boosting the productivity of agriculture in the developing world and forming alliances to leverage the vast resources of the private sector. Recognizing the important and growing role of private companies, foundations, and other actors in development, USAID initiated the Global Development Alliance (GDA), a new model of public-private alliances that enables USAID to extend its reach and effectiveness in meeting development objectives by combining its strengths with the resources and capabilities of others.

In FY 2002, 75 new alliances, formed with total USAID funding of \$111 million, leveraged about \$380 million in non-governmental resources. The Collaborative Agricultural Biotechnology Initiative (CABIO) was established to help developing countries access and manage biotechnology to reduce poverty and hunger. Also in FY 2002, with the reopening of the U.S. Embassy in Kabul, USAID reactivated official assistance to Afghanistan. The Agency's efforts are enabling Afghan farmers to re-establish production and increase their efficiency and profitability.

During FY 2002, USAID supported agricultural activities in over 70 countries to address regional and worldwide strategic priorities. Agricultural obligations were made by the four regional bureaus as well as two pillar bureaus, EGAT and DCHA, and the Policy and Program Coordination Bureau (PPC). The pillar bureaus, established in FY 2002 as part of the Agency's reorganization are Economic Growth, Agriculture, and Trade (EGAT); Democracy, Conflict, and Humanitarian Assistance (DCHA); and Global Health (GH).

Among the regional bureaus, Africa continued to manage one of USAID's largest agricultural programs, aimed at reducing hunger, food insecurity, and poverty through environmentally sound agricultural growth. In Asia and the Near East, USAID's agricultural programs supported

a variety of agricultural policy reforms, agribusiness development initiatives, and water resource and rural infrastructure improvements. USAID's programs in Latin America and the Caribbean focused on assisting sub-regional trading blocs with trade matters, improving the institutional infrastructure to help the poor access markets, and conserving biological resources. The primary emphases of USAID's assistance to the countries of Europe and Eurasia were developing agribusiness and trade and improving quality standards of products for local and export markets. The Bureau for Democracy, Conflict, and Humanitarian Assistance (formerly the Bureau of Humanitarian Response) provided funding for agricultural activities through its Office of Foreign Disaster Assistance, Office of Private and Voluntary Cooperation, and its Office of Food for Peace, which administers the Title II (P.L. 480) Food for Peace Non-Emergency Program.

Over the next year, USAID will expand on the directions of the interim strategy, holding stakeholder consultations with Title XII partners to provide guidance to the Agency as it refines its strategic themes.

INTEGRATING NATURAL RESOURCE MANAGEMENT AND AGRICULTURE

Agriculture has always relied on the human management of natural resources. From the earliest domestication of plants and animals to the engineering of irrigation systems for high-value crops, humans have manipulated nature to produce food and wealth. In many developing countries, natural resources—land, minerals, forests, wildlife, and water—dominate national economies, corporate profits, and individual wealth. A healthy resource base is essential to agriculture and the sector’s ability to drive household and national economies and spur broad-based development.

However, maintaining natural resources in a healthy state requires careful management. Wise resource management is becoming increasingly important as the human population’s demand for food, fiber, and energy increases. This report examines the history of USAID’s integration of natural resource management and agriculture, the lessons learned, accomplishments of current programs, and future directions for the integration of natural resource management into USAID’s agriculture strategy.

THE INTEGRATION OF AGRICULTURE AND NATURAL RESOURCE MANAGEMENT

For over four decades, USAID’s agriculture interventions have reflected the evolution of thought concerning the interdependence of agricultural productivity and sound natural resource management (NRM). USAID’s early agriculture work coincided with the dramatic increase in cereals production brought about by the Green Revolution, which was spearheaded by technological advances made by the International Rice Research Institute (IRRI) and the International Maize and Wheat Improvement Center (CIMMYT). Where high-yielding rice, maize, and wheat varieties were complemented by fertilizer, pesticides, and irrigation, vast yield increases were achieved. USAID emphasis on green-revolution technologies resulted in increased availability of low-cost cereals, particularly in parts of Asia and Latin America where farmers had access to critical inputs.

During the 1960s, a number of other influences gave rise to the modern environmental movement, which also had important impacts on USAID’s work. Rachel Carson’s *Silent Spring*, published in 1962, alerted the public to the threats that pesticides pose to the environment and to humans. The ensuing decade witnessed a broader social movement in the United States that questioned political and social conventions of the day. Landmark legislation and events over the next 10 years reflected this heightened environmental awareness. The Wilderness Act (1964), the creation of the Environmental Protection Agency (1969), the Clean Air Act (1970), the first Earth Day (1970), the Water Pollution Control Act (1972), and the Endangered Species Act (1973) reflected a sea change in attitudes of the American public. The popularization of the environmental movement and the

mainstreaming of environmental and social concerns related to modernization and development provided the impetus for a reexamination of agricultural practices.

The 1970s: Soil & Water Management and the Farming Systems Approach

Despite the successes of the Green Revolution, by the early 1970s there was growing recognition that the approach was not suited to all environments or farmers. A broader approach to agriculture incorporating elements of NRM was needed in order to reach resource-poor farmers and address the environmental impacts of farming practices that relied heavily on agricultural inputs. In 1973, the Sahelian drought underscored the limitations of technology change linked largely to new varieties. In response, USAID developed the Soils Consortium and began to work intensively on soil classification and management, tree crops, and reforestation. The International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) and the International Center for Agricultural Research in the Dry Areas (ICARDA) were created and began to look at on-farm ecological interactions that affected productivity.

These experiences were reflected in the design of a Farming Systems Approach (FSA) to agricultural development. FSA linked researchers with ongoing outreach and training, working with resource-poor farmers to identify their constraints and agricultural technology needs. This broadened the scope of agricultural development programs to include socio-economic and ecological influences on agricultural production. FSA became a major thrust of activities, and over 76 USAID projects were implemented between 1978 and 1988 incorporating these

methodologies.¹ Despite its intent to look at farming systems more broadly, in its early phases FSA continued to focus on increasing the yield of specific commodities in relation to the farm rather than taking a truly integrated approach that evaluated the entire range of economic opportunities within the farming system.

The 1980s: NRM Research, Participatory Rural Appraisal, Gender Analysis, and Community-Based Natural Resource Management

In the early 1980s, USAID began to place increased emphasis on managing natural resources for increased agricultural sustainability as well as productivity. The Agency strongly supported the creation of four International Agricultural Research Centers (IARCs) that targeted NRM issues: the International Center for Research in Agroforestry (now known as the World Agroforestry Center), the International Water Management Institute (IWMI), the Center for International Forestry Research (CIFOR), and the International Center for Living Aquatic Resource Management (now known as the World Fish Center). These institutions were a powerful tool for investigating critical NRM issues and deepening understanding of how agriculture impacts the resource base. In addition, USAID initiated two new Collaborative Research Support Programs (CRSPs) that expanded on earlier experiences in pest management and aquaculture: the Integrated Pest Management CRSP and the Pond Dynamics/Aquaculture CRSP.

In the field, several developments contributed to knowledge about the complex interactions between agriculture and NRM in the rural household. The advent of participatory rural appraisal techniques allowed a much clearer understanding of

local priorities and motivations related to resource use, and provided local stakeholders a stronger voice in the development and management of projects. At the same time, gender analysis shifted the focus from the male farmer to the diverse economic responsibilities and contributions of all family members in the rural household. Community-based natural resource management projects, such as USAID's Zimbabwe CAMPFIRE, began to explore the potential for conservation of resources and economic development when local stakeholders had access to and authority over management of state owned natural resources.

By the end of the decade, the need for more ecologically sustainable methods of agriculture was emerging as a clear mandate. *Alternative Agriculture*, a National Research Council (NRC) report, described the environmental and human costs of high-input agricultural production in the United States. *BioDiversity*, the proceedings of a 1986 conference sponsored by the National Academy of Sciences and the Smithsonian Institution, heralded the vital role played by biological diversity in agriculture and other human activities, warned of the alarming rate of species loss due to tropical deforestation, and discussed the links between international conservation and economic development.² Setting the stage for the next decade's focus on sustainable agriculture, Congress passed legislation that mandated new initiatives within USAID. The Agency was asked to: (1) augment its current agriculture programs by emphasizing sustainable agriculture and (2) undertake a new activity focusing specifically on sustainable agriculture.³ In response to this mandate, USAID asked the NRC to plan a new CRSP focusing on the research needs of sustainable agriculture and NRM.

The 1990s: Sustainable Agriculture, Economic Growth, and Good Governance

The Sustainable Agriculture and Natural Resource Management (SANREM) CRSP was established in 1991, based on the plan developed by the NRC. SANREM's goal was to conduct research that would guide developing countries in improving the welfare of their populations by sustaining agricultural productivity in an environmentally and socially responsible manner. Specifically, SANREM promotes innovative, integrated systems-based research on agricultural systems within the socio-economic-political environment, provides decision-making tools and methodologies for agriculture and NRM, and develops information management systems that support knowledge and network building worldwide.

Even as programs such as SANREM expanded the concept of agricultural development, the physical scale of NRM also broadened, from the farm to the landscape level. Recognizing that the movement of nutrients, water, and living organisms is not limited by boundaries of field and farm, ecologists developed models to describe the impact of various forms of land and resource use on the flow of nutrients, water, and organisms across the landscape. New technologies such as GIS (geographic information systems) assisted in this scaling up.

During the 1990s, three major trends had an impact on USAID agriculture programs. The first trend was a growing appreciation of the connection between economic growth and food security for the poorest communities in developing countries. This made economic growth and trade the main objectives of many USAID agriculture programs. The focus shifted from merely increasing crop

yields to economic analyses of net profitability of farm activities. Agriculture was also increasingly understood to include all the steps involved in getting a product from the farm (or forest or lake) into the hands of consumers, which led to a stronger emphasis on agribusiness, processing, and marketing. The second trend was recognition of the importance of land and resource tenure in the development of sustainable agriculture. Policymakers realized that they could not ask farmers to make the long-term investments in natural resources required to make agriculture sustainable unless farmers were assured that they would have long-term access to the land they used. The third trend, an increasing focus on governance, was a response to the decentralization of authority occurring in many developing countries. As local communities began to have more control over natural resources, they needed to develop structures to manage them effectively and equitably. In response to these last two trends, capacity building in governance and addressing land rights issues became increasingly integrated into USAID's sustainable agriculture programs.

By the end of the 1990s, SANREM and a range of other USAID research and development projects had come to promote agricultural techniques that enhanced productivity, environmental management, and social equity. Between 1990 and 2002, over 180 bilateral, regional, and global projects incorporated components of sustainable agriculture consistent with the revised Title XII legislation's definition of agriculture, which includes agribusiness, processing, forestry, fisheries, and wildlife, in addition to more traditional crop and livestock components of agriculture.

CURRENT APPROACH TO INTEGRATING NRM AND AGRICULTURE

The integration of NRM and agriculture is a goal that USAID continues to pursue in its development programs. Experience has shown that this integration requires attention to relevant environmental, economic, governance, and human capacity issues. *Nature, Wealth, and Power: Emerging Best Practice for Revitalizing Rural Africa*, a report published in 2002 by USAID, is based on an assessment of more than 20 years of development programs in rural Africa. It provides a framework for bringing together these environmental (nature), economic (wealth), and governance and human capacity (power) issues in natural resource-based development. Although the report was written to influence future development investments in Africa, its basic principles are applicable to USAID programs around the world.

An important theme of this report is that successful development programs cannot merely cobble together separate environmental, economic, and governance activities but should intentionally integrate these areas in program design, implementation, and evaluation. This is not a simple task, but USAID is making good progress toward this integration. The Congo Basin Forest Partnership announced by Secretary of State Powell at the World Summit on Sustainable Development is an example of an initiative that recognizes the integral and equal roles played by economic development, social development, and environmental protection in attaining sustainable development.

The recent reorganization of USAID is a step toward remedying the structural constraints to interdisciplinary approaches to agricultural development. For example, in the Bureau of Economic Growth, Agriculture and Trade, staff with expertise in agriculture, NRM, or environmental or economic policy are now working together in the Offices of Environment and Science Policy, Natural Resource Management, and Agriculture. New inter-office teams are bringing together people with diverse backgrounds and skills to work on cross-cutting issues.

Through partnerships with the Title XII and non-Title XII agricultural development communities, USAID is working to alleviate the constraints faced by smallholder farmers that exacerbate the degradation of the natural resource base for agriculture, including fisheries and forestry, and to promote agricultural strategies that are ecologically, economically, and socially sustainable. While the consistent integration of environmental, economic, and governance issues in NRM and agriculture is a work in progress, there are many examples of activities that capture one or more aspects of this approach.

Environment

Effective management of natural resources for agriculture requires an understanding of the patterns and processes that influence resource availability. Soil fertility, for example, is influenced by the cycling of nutrients through plants, animals and microbes; the weathering of rocks; the flow

of water through soil; and farming practices. Successful management of crop and livestock pests requires an understanding of pest life cycles and behavior, their interactions with other species, and their environmental tolerances. While knowledge of local conditions is important to effective field-level management of natural resources, so is an understanding of general principles and larger-scale patterns and processes.

agriculture, attention to capacity building is essential. An important starting principle is that the knowledge held by each of these players is valuable to the process of improving NRM. USAID supports projects in capacity building and human resources that capitalize on field experience; promote research, extension, and education linkages; and foster innovation and experimentation.

| Principles to Guide Natural Resource Management Investments | | |
|---|--|---|
| Nature | Wealth | Power |
| Improve information and knowledge management systems | Be strategic about the economics of natural resource management | Strengthen environmental procedural rights for rural people |
| Promote local land-use planning and appropriate resource tenure systems | Strengthen markets and NRM market incentives | Improve rural input into public decisions and policy |
| Foster innovation, social learning, and adaptive management | Invest in rural organizations | Redistribute natural resource authority and functions |
| Build capacity and invest in human resources | Create a framework for better NRM choices | Transfer powers, rights, and responsibilities to representative and accountable authorities |
| Promote cost-effective technical, advisory, and intermediary services | Assure that local resource managers have secure access to NRM means and benefits | Explore a minimum environmental standards approach |
| | | Promote platforms that allow for continuous and inclusive consultations |

From *Nature, Wealth, and Power: Emerging Best Practice for Revitalizing Rural Africa*.

Sharing knowledge among farmers, farming communities, researchers, and development organizations is key to improving the management of the natural resources upon which agriculture depends.

Improved capacity is required at all levels to address the growing need for wise management of natural resources in agriculture. From the agriculturalist to the NGO employee, from the extension agent to the research scientist, from the local government representative to the minister of

Science and technology are important tools for understanding the patterns and processes that influence natural resource availability, developing improved varieties of crops and new breeds of livestock that are high-yielding and appropriate to local conditions, and testing the environmental sustainability of various agricultural practices. While science and technology do provide an expanding “toolbox,” they cannot be used in isolation to determine what should be “built” with these tools.

Wise NRM takes into account the volatility of natural and human-constructed systems and plans explicitly for it. Too many management programs assume a balance of nature that does not exist. Extremes in precipitation and temperature and outbreaks of insects and pathogens may be infrequent, but they are inevitable. Similarly, economic and political systems that impact agriculture and other uses of natural resources have their own volatility. Both types of disturbances have the potential to undo years of agricultural and NRM programming. Understanding the risks and planning for them should be a part of all agricultural and NRM programs. In regions prone to frequent natural disasters, steps should be taken to mitigate, reduce, or prevent their impacts.

Knowledge is critical for incorporating sound NRM into agriculture. For example, all phases of NRM—planning, implementation, monitoring, and decision making—are knowledge-intensive. As lessons are learned and data are accumulated from research and agricultural development projects around the world, sharing, synthesizing, and analyzing that knowledge becomes paramount. Management of knowledge is becoming increasingly important, and USAID is supporting programs that facilitate it.

The following projects represent the diversity of approaches to the promotion of sound environmental management in agriculture:

- *In Angola, productivity increases in maize (30 percent), beans (24 percent), and sorghum (18 percent) were seen in provinces where farmers had received agricultural extension services focused on appropriate planting density, the use of natural pesticides, compost making, and postharvest loss management. Over 50,000 farmers (39 percent of whom*
- *were women) received this USAID-supported training. As a result, farmers adopted new agricultural technologies, including better seeds, plants for natural soil enrichment, and techniques for erosion control, at a higher rate than in previous years.*
- *The use of reclaimed water for irrigated agriculture in Morocco has had positive economic and environmental impacts. USAID/Morocco supported the development of a demonstration wastewater treatment and water reuse facility. The project included extensive participation of the stakeholders and the development of a water users association that manages the distribution of the reclaimed water. Following the introduction of drip irrigation and farmer training, farmers are now growing a range of cereals, vegetables, and forage crops with the reclaimed water. Not only does this provide a reliable source of inexpensive water, but because of the nutrients in the reclaimed water, the farmers are able to reduce their fertilizer use.*
- *To promote agricultural and NRM research in Africa, the Sustainable Financing Initiative (SFI) of the Africa Bureau works with African institutions to create the financing mechanisms, partnerships, and management skills required for sustainable African research programs in these areas. One of the organizations assisted by SFI is the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), a non-political umbrella organization of National Agricultural Research Institutes in ten countries. ASARECA's key objective is to promote regional economic growth by developing,*

introducing, and disseminating sustainable agricultural technologies.

- *With support from USAID, the Forest Service initiated the Albania Watershed Assessment project in 1999 to identify the causes of frequent severe flooding and sediment deposition over much of Albania. The Forest Service worked closely with Albanian ministries and institutions to define the problem, pinpoint its causes, and build local capacity to cooperate, share information, and address problems within a landscape management perspective. As a result of the assessment, project partners are now working through both legislation and economic incentives to improve mining, agriculture, grazing, and forestry practices in ways that will reduce flooding and sediment deposition.*
- *The Geographic Information for Sustainable Development (GISD) program has made significant advances in improving field applications of GIS technologies for Africa. Two prominent examples of this work are the flood hazard monitoring system developed for Mozambique and the soil and water conservation monitoring tool developed for Mali. GIS is quickly becoming an essential tool in the sustainable management of agricultural ecosystems by making it possible to quickly combine spatial information with other data and then analyze patterns at the most relevant scale. The GISD program conducted twelve case studies on GIS applications across Africa to disseminate lessons learned.*

TRACKER and FRAME are two tools developed with USAID funding that are improving knowledge sharing in NRM and agriculture. FRAME is an Internet resource

that provides a place for analysts and decision-makers to think strategically about African environmental and NRM issues. For example, a program officer in one country can rely on FRAME to find other initiatives underway in neighboring countries and check for synergies, query fellow specialists throughout Africa, or draw on a regularly updated database. TRACKER is a database that allows users to enter their experiences with local resource management and learn from the experiences of others. For example, if a forester trying to improve soil conservation in Senegal wants to look for conditions of success in similar efforts in the Sahel, she can search and download related initiatives, each of which includes a ranking of distinct enabling conditions.

Economics

In many developing economies, natural capital is the single most important economic asset in the country. Natural resources serve as the basis for rural production and economic systems as well as for individual wealth. Investments in the wise use of these resources have the potential to generate a significant impact on the livelihoods of the rural poor at the local level and a high rate of return at the national level. Sound NRM strategies must reflect sound economic policies and principles.

Emerging global market opportunities provide strong incentives for the adoption of better NRM and agricultural practices. However, access to these markets has been problematic for most smallholder farmers in developing countries. USAID is facilitating market access by addressing the constraints imposed by inadequate trade and marketing systems. By assisting producers in addressing product quality specification, food safety issues, and environmental concerns in regional and global markets,

USAID is supporting best practices in NRM and agriculture.

Investing in rural organizations makes good economic sense, in addition to its important governance, technical, and political benefits. Well-managed and locally controlled rural organizations create economies of scale and contribute to higher economic returns for the rural poor. Building capacity for local credit and savings is much more cost-effective and far more replicable than relying on external financing for projects. And, most important, “local ownership” of the process unleashes powerful incentives for cost control and program efficiency, whereas external funding often sets up the opposite dynamic. These lessons are now being applied in USAID’s programs of NRM and agriculture.

The following are examples of USAID projects that have a major focus on the economic aspects of integrating NRM and agriculture:

- *“Green seal” certified forests in Guatemala have boosted income from the sale of timber while protecting the natural resource base. Community based forest management activities have been implemented on 392,056 hectares, generating \$3 million in revenue and 22,000 labor days benefiting 25,000 people. Guatemala now ranks among the world’s leaders, with 326,577 hectares of community- based forest being “green seal” certified (making Guatemala the country with the largest area of certified community forest concessions in the world), and 69 percent of the timber production exported to international markets. In 2002, the Association of Forest Communities in Petén, an organization representing 30 rural communities in the buffer zone of the Mayan Biosphere Reserve, was awarded the Equator Initiative Prize along with*

29 other finalists in Johannesburg for their sustainable forest management.

- *Agribusiness for Sustainable Natural African Plant Products (ASNAPP) is a university-private sector project sponsored by USAID that has helped small-scale commercial farmers and rural entrepreneurs in Ghana, Madagascar, South Africa, and Zambia enter local and international markets with their indigenous teas, medicinal plants, and essential oils. ASNAPP market successes in FY 2002 included the sale of 35 tons (a 50 percent increase) of honeybush tea to Honest Tea (U.S.), a new iced tea product launched in Chicago, and the sale of 50 tons of rooibos tea to Fair Trade in the Netherlands, as well as increased sales in several local African markets. A small-scale organic honeybush nursery and ASNAPP partner in South Africa earned the title of “Top Female Producer: Informal Markets” by the Western Cape Provincial Department of Agriculture.*
- *Sustainable forest management has become one of USAID/Peru’s highest priorities in the last year. The mission has provided support to the government’s efforts to reform and modernize the forest sector. To date, 3.3 million hectares have been granted to forest concessionaires and at least 1.2 million hectares are about to be awarded. Particularly noteworthy is a working relationship established with assistance from USAID Global Development Alliance between a U.S.-based export/import business and local wood industries in an effort to create greater synergy among producers, industry, and the marketplace, and take advantage of forest certification and the promotion of lesser-known species.*

- *USAID-supported research in the Philippines has demonstrated the bio-economic rationale for the expansion of tree planting by upland farmers, a category of land managers who are responsible for considerable environmental degradation in Southeast Asia. Economic models have been developed to enable farmers to assess the trade-offs and impacts of tree farming. The information is relevant not only for farmers but also for credit institutions and policy makers. It supports incentives to encourage farmers to move away from environmentally unsustainable vegetable production practices towards integrated agroforestry systems. Agroforestry research has also fed into calculations of the value of carbon sequestration, providing evidence to governments and producers of benefits from sustainable land management practices.*

Governance and Human Capacity

Good governance is crucial to managing natural resources and promoting economic growth. Underdevelopment, environmental degradation, poverty, and famine result not so much from a lack of natural wealth, but from decisions and systems, often political in nature, on the distribution of resource wealth and relevant citizens' rights. Mismanagement of natural resources can contribute to and exacerbate conflict and corruption.

A positive development in the past decade has been the granting to citizens of substantive environmental rights by many new constitutions and national environmental management statutes, often supported by multilateral environmental agreements. Most constitutions also place duties on citizens to protect the environment

and manage natural resources wisely. To realize these rights—including, in particular, property rights over land and natural resources—and to fulfill constitutional obligations to safeguard the environment, citizens and their associations need effective guarantees of certain civil liberties and procedural rights. For example, citizens must be empowered to hold all resource users—large and small, public and private—accountable for their decisions and actions.

Another positive trend is the increasing devolution of power to local communities and governments, including authority over the use of land, water, biodiversity, and forest resources. Capacity building in governance, conflict resolution, and best practices in NRM and agriculture are crucial as local communities take on these expanding responsibilities. USAID projects are supporting communities in this process.

There are many examples of USAID-supported projects that address governance and capacity building in relation to NRM and agriculture. For example:

- *Farmer and herder communities in Mali are working together to manage the land resources upon which they both depend. The SANREM CRSP has trained representatives selected by these potentially conflicting communities in resource management, conflict mediation, NRM legislation, financial planning, and literacy. An elected body was created to advise local government on NRM issues. A conflict management manual produced in the local dialect is being used by community-based environmental monitors as they negotiate disputes over land resources. These efforts have contributed to reductions in conflict between farmers and pastoralists over the use of their natural resources.*

- *In Namibia, USAID-supported community-based NRM programs are helping communities register as conservancies, organize and effectively run conservancy management committees, establish and implement resource management plans, and enter into joint ventures with private sector investors and tour operators. The programs introduce economic incentives, supported by sound social, democratic, and environmental principles, through effective NRM. Conservancy formation has served as a basis for a politically active civil society. To date, fifteen community conservancies are registered and 34 more are currently being organized. Almost 4,100,000 hectares of communal land are now under local management, and more than 34,453 individuals living in these areas will receive benefits.*
- *The Uganda mission's program of support to sound environmental planning and management facilitated the completion of 64 environmental action plans at several levels of local government, employing a participatory process that engaged over 15,000 people in four districts, and ensured local ownership of the action plans.*
- *In North Sulawesi, Indonesia, a new law gives villages and sub-districts the authority to create and enforce local coastal management plans. In response to this opportunity, USAID is supporting the development of these plans. In FY 2002, the number of villages participating in USAID-sponsored community-based coastal zone management planning increased from 5 to 30.*
- *The government of Nepal has one of the most progressive policies worldwide for devolving management of forests and maintenance of irrigation canals to community forestry and water user groups. USAID works through partner organizations to support the formation of user groups and their institutional development. In 2002, 129 new community forestry user groups and 410 new irrigation user groups were formed, bringing the total number to 2,909 in the region where USAID works. The positive impact of these groups is reflected in both the area of land handed over and the increase in the annual production of forest and pasture biomass. As of 2002, 161,734 hectares have come under the management of forest user groups.*
- *The ability of managers to effectively measure, control, and allocate water resources has been significantly increased through a USAID program in Central Asia. Many farmers in this region rely on irrigation canals, but ineffective water management has diminished irrigated lands and reduced yields. A large-scale pilot project on the Pakhtaabad Canal includes training for canal operators in new monitoring tools and management practices. This canal serves more than 20,000 hectares of irrigated land and about 100,000 farmers in Andijan, Uzbekistan and Jalalabad, Kyrgyz Republic. Already, significant water savings have been demonstrated, and increases in cotton yields can be attributed, at least in part, to better water management.*
- *USAID's Bolivia Sustainable Forestry Program (BOLFOR) is largely responsible for the "democratization" of access rights to forest resources incorporated into the country's 1996 Forestry Law. In 2001, the first 12 local community groups were officially presented with forest concessions; by the*

end of 2002, 16 out of 41 community groups had forest concessions, while the rest had some form of approved forest management instrument, totaling 916,067 hectares of forest. BOLFOR continues providing technical support to seven indigenous communities, leading to an increase of more than 464,300 hectares under approved plans with community forestry enterprises. The total forest under indigenous groups' management is about 700,000 hectares.

- In Guinea, over 88,000 hectares of forests and tree plantations were under sustainable management by the end of FY 2002. The Government of Guinea devolved the management of these forests to local communities, giving them the responsibilities for as well as the benefits of sustainable management of their forests. Villagers have taken numerous actions to protect forests and watersheds, rehabilitate degraded areas, and institute agro-forestry practices. In addition, community-based organizations helped develop 52 village-level NRM plans with timelines for communal implementation of activities. USAID also supported the signing of 60 long-term land-use contracts between landowners and land users, a means to enhance land security for producers.
- The Broadening Access to Sustainable Input Systems (BASIS) CRSP and BASIS Indefinite Quantity Contract (IQC) have made significant contributions to research and action programs on land tenure and property rights reform. In South Africa, BASIS CRSP research revealed major inequities in the process of distributing land reform grants, and a process has been initiated to revise the policies to increase access of the poor to these grants. Technical assistance provided by the BASIS IQC has assisted

in transforming the Georgian Ministry of Agriculture and Food from a Soviet style institution to a more effective ministry that provides policy advice and a regulatory environment consistent with the requirements of a market economy. In Albania, technical assistance provided by BASIS supported the first registration of land, which will provide greater tenure security and facilitate land market development. EGAT staff, in collaboration with the World Bank, facilitated regional workshops on Land Policy and Administration in Eastern Europe, Africa, Latin America, and Asia. The workshops will result in research that will shape World Bank policy on land issues.

EMERGING CHALLENGES FOR AGRICULTURE AND FOOD PRODUCTION

Looking forward, USAID agricultural programs must address emerging trends and adapt to new issues in a world that is changing at an unprecedented rate. Globalization, population growth, and technological advances are combining to dramatically challenge agriculture and NRM around the world.

Population growth and the related need for increased food provision will pose the most significant hurdle for sustainable agriculture in the future. Over the next 20 years, more than two billion children will be born, more than 95 percent in the developing world. To provide food for a healthy and active population, agricultural producers in developing countries must be able to nearly double the current productivity of their land, water, and labor resources.

Competition for natural resources will intensify dramatically. Water is seen as a defining resource for the coming decades, when a third of the world's population will face water deficits. Currently, agriculture uses 70 percent of the world's freshwater supply, while inefficient irrigation systems return only 30 to 60 percent of water for downstream use.⁴ Increased productivity of water in agriculture is critical for meeting increasing demands for domestic and industrial use and for maintaining adequate stream flow for aquatic ecosystems. Land resources are also under pressure. By 2030, the available arable land per person in developing countries is expected to drop to 0.16 hectares—half of what was available in 1963.⁵ The most productive agricultural lands are already being farmed, so future

agricultural expansion will be on more marginal lands—often hillsides or land with poor soil quality. In addition, land is increasingly sought for a number of non-agricultural uses including residential and industrial development and the establishment of protected areas. Reduced productivity of existing farmland is resulting from poor management techniques that result in soil erosion, loss of soil carbon, and salinization. It is believed that salinization alone accounts for \$11 billion annually in reduced productivity.⁶

The world's biodiversity is also under tremendous pressure from agricultural expansion and burgeoning populations. Over a billion people live in or around areas containing the world's most threatened biodiversity. Significant portions of the world's forests have been lost in this century, and existing wildlands are increasingly being fragmented. Genetic resources are isolated as small areas of natural habitat are separated during the conversion of forests to farms and residential areas, potentially threatening the survival of key species and genetic resources.

Human activities are accelerating environment change, in ways that impact both wildlands and agricultural landscapes. Over the long term, global warming is contributing to the increased frequency and intensity of severe weather events that often take the heaviest toll on the rural poor. Agriculture is the sector likely to be the most vulnerable to the effects of climate change. Without significant capacity to adapt to changing conditions, the national

economies of developing countries that rely heavily on agriculture are especially at risk. On the local level, human activity is introducing more immediate environmental change through pollution, soil erosion, over-utilization of water sources, and deforestation, threatening both human health and the natural resource base upon which agriculture depends.

HIV/AIDS, tuberculosis, malaria, and other debilitating diseases are dramatically affecting farming communities and undermining the ability of developing countries to meet their food production needs. These diseases impoverish households through the loss of labor and productivity, increased costs of health care and funerals, diminished capacity to care for children, and erosion of the household asset base. HIV/AIDS in particular reduces the inter-generational transfer of skills and knowledge of agriculture while it also erodes the human resource base of institutions critical for developing nations.

Fortunately, several factors are promoting efforts to develop and maintain sustainable and productive agricultural systems. Growing consumer demand for high-quality products that are healthy and produced in an environmentally and socially responsible manner is creating a market force for changing agricultural practices. In reaction to perceived consumer demands, multinational supermarkets and buyers are mandating product quality standards that include social and environmental components. Recent evidence suggests that these requirements are extending beyond large-scale commercial operations to reach smallholder producers in developing countries. In some cases, “green” labeling brings a higher price and thus an added incentive for environmentally sound production methods, but more importantly it provides access to increasingly competitive

markets. Certification programs for coffee and lumber are at the forefront of this movement.

Increased appreciation for—and commercial valuation of—ecosystem services also promotes more sustainable NRM. In some developing countries, communities are increasing revenues by providing wildlife management and watershed management services resulting in increased numbers of game and more reliable water provision. A global “carbon trading” market is also emerging that may provide financial incentives for communities in developing countries to manage their natural resources wisely. While payment for environmental services is in its infancy, it holds great potential for the future.

The decentralization of authority over natural resources provides another opportunity for advancing sustainable agriculture and NRM. Developing nations around the world that once had centralized control of natural resources are now transferring that authority to local or regional entities. USAID is already engaged in programs to build local governance capacity in many of these countries, and NRM could be used as the context for strengthening decision-making, planning, and conflict resolution skills.

Finally, advances in science and technology are helping to meet tomorrow’s challenges. Technology is assisting in the development of new varieties of crops that are high-yielding, pest-resistant, and more tolerant of drought and low-nutrient and saline soils. They hold the promise of reducing pesticide and fertilizer use while increasing productivity. Evolving GIS technologies are facilitating the synthesis of spatial information with health, poverty, economic, and environmental data to enable analysis on multiple scales, from single fields to

continents. Applied on a very local scale, GIS can assist farmers in precision agriculture: adjusting planting, watering, fertilization, and pesticide application to within-field heterogeneity and greatly increasing profitability. On a larger scale, GIS makes it possible to assess the environmental impacts of various land use and farming practices at the watershed or regional level. Information technology is facilitating communication in ways that enhance training, policy making, and risk management.

FUTURE DIRECTIONS IN AGRICULTURE — IMPROVING THE SOCIAL, ECONOMIC, AND ENVIRONMENTAL SUSTAINABILITY OF AGRICULTURE

Sustainable Agriculture should not be conceived as “steady-state agriculture,” but rather as a different, more dynamic and realistic way to think about how agriculture, broadly defined, can contribute to sustainable poverty alleviation and food security. (McNeely, Gregerson, Mueller, SPARE Sub-Sector Review of Sustainable Agriculture, May 2003)

In a global economy, agriculture’s long-term viability relies on the ability to access and analyze relevant information and quickly modify farming and business practices to capitalize on emerging opportunities. Agriculture and natural resource-based enterprises must also simultaneously protect the health of the resource base, spur economic growth, and foster good governance and human capacity. Recognizing the interdependence of the social, economic and environmental components of agriculture will be central to future USAID programs in this sector.

Sustainability and adaptive management will be guiding principles in the development of new programs to ensure that building an efficient and competitive agriculture sector does not jeopardize the human and natural resource base upon which it relies. The promotion of sustainability assessments will help answer critical development questions. Will policy reform result in an enduring transformation of society? Do local partners have the institutional, financial, and human resources to maintain progress after the end of a project? Can smallholders adapt to the evolving marketplace? Do agricultural activities have a positive impact on the local and landscape scale in preserving the

productivity of the resource base? Promoting an adaptive management approach will improve the ability of USAID staff, partners, and stakeholders to analyze past successes and failures, incorporate external knowledge and information, and identify effective approaches to emerging problems.

“Improving the Social, Economic, and Environmental Sustainability of Agriculture” is a major theme that embodies the guiding principles of USAID’s agriculture strategy. Four objectives will contribute to operationalizing this theme in USAID programs over the next 5 years. They are:

- *Strengthening local capacity to manage agriculture and natural resources;*
- *Enhancing economic frameworks for agriculture and natural resource investments;*
- *Improving the health of land, water, biodiversity, and forest resources; and*
- *Strengthening agriculture and natural resource policy and governance.*

Strengthening Local Capacity to Manage Agriculture and Natural Resources

In many developing countries, institutional and human capacity building is needed to ensure that agriculture is effectively managed within the context of the larger landscape. USAID will work to develop this local capacity by strengthening producer organizations and community groups, increasing access to information and knowledge, and promoting farmer innovation.

Producer organizations and community-based groups play a critical role in linking smallholders to the market, decreasing transaction costs, and providing a strong, unified voice to advocate for local needs. USAID will work to enhance the business management, marketing, and negotiating skills of these groups to enable them to become stronger advocates for the producers and communities that they represent.

Increased access to information & knowledge is crucial to providing new options for sustainable agriculture and NRM. The Agency strives to create and support the networks that enable the sharing of knowledge, and to ensure broad access to knowledge. Promoting linkages between extension, education, and research is one way to accomplish this. Agricultural research institutions should work closely with farmers and policy-makers to ensure that research agendas are targeted towards critical development needs and produce technologies that are applicable on the farm. When improved farming, forestry or fishing methods result from research, they must be communicated quickly and effectively to practitioners. USAID will continue to support projects whose main objective is the improvement of methods used to link

researchers, educators, extension agents, and producers.

A viable knowledge network must also promote farmer innovation and the use of local knowledge. Local knowledge is crucial for adapting to local conditions the general principles and tools developed through research. Because of local differences in soils, topography, weather, and pests, even technologies produced in concert with farmers will not be applicable across all environments. Improved NRM practices are considerably more knowledge-intensive than many agricultural production technologies, which are often embodied in inputs such as seeds, equipment, or chemicals. Learning is central to the cycle of developing, disseminating, and evaluating new methods. The knowledge requirements of NRM reinforce the necessity of farmer-centered strategies.⁷

Enhancing Economic Frameworks for Agriculture and Natural Resource Investments

New investments and employment that provide long-term productivity and income generation are powerful mechanisms for encouraging local communities to protect their resource base. USAID will provide tools to help communities determine which of a range of potential investments are most likely to achieve the dual goals of resource protection and economic growth. Key elements of USAID's approach will include improving the competitiveness of agriculture and natural resource-based enterprises, promoting cleaner technologies, developing markets for environmental services, promoting industry codes of conduct, and helping local producers to meet increasingly stringent private and public standards for agricultural products.

Improving the competitiveness of agriculture and natural resource based enterprises results in increased profits that can support new investments and employment in rural communities. Producers need the capacity to assess the long-term effects of their management practices on their resources. They also need to evaluate the relative profitability of a range of potential income-generating activities including aquaculture, timber and fuel wood, eco-tourism, wildlife management, and agro-forestry, in addition to crops and livestock. In some cases, off-farm employment or non-traditional agricultural enterprises such as natural products or sustainable tourism can provide higher returns than traditional crops. Identifying new market opportunities is becoming increasingly important in enhancing competitiveness.

Promoting cleaner technologies in agricultural production and processing can increase competitiveness while reducing environmental impact. "Cleaner production" is an integrated strategy for preventing or reducing waste at the source rather than managing it at the end of the production process by using such techniques as good housekeeping, reuse/recycle, by-product recovery, materials substitution, and in process modification. It addresses environmental protection, efficiency, quality, and economic savings. Investments in clean technologies frequently pay for themselves in as little as six months, making them appealing to businesses seeking to increase their competitive edge.

Functioning markets for agricultural commodities are often cited as key to sustainable economic development for rural people. However, developing functioning markets for environmental services (e.g., water provision, carbon sequestration, biodiversity conservation, and ecotourism)

represents an opportunity to integrate expanding economic opportunities with sound environmental management. It involves establishing systems for equitable payment from resource users to the individuals or communities that maintain the resource. This approach requires understanding market demand, land tenure, equity, collective action, and the needs of local people acting as service providers. A fundamental principle is that these payments are not subsidies, but legitimate payments for social and environmental public services that accrue from sound environmental management.

USAID has been effective in bringing a range of private-sector and public-sector stakeholders together to address critical issues in agriculture, including the development of industry codes of conduct. The development of good management practices for shrimp culture in Central America is one example that brought local communities and business concerns together to minimize the negative environmental impacts of a growing industry. Future activities will seek to expand opportunities to create effective alliances between industry, the public sector, and local communities.

To capitalize on high-value products and ensure continued access to markets, it will be necessary to develop local capacity to meet the growing range of private and public standards and certification regimes. As transnational supermarkets consolidate supply chains, they are demanding that local producers comply with increasingly stringent environmental, social, and product-quality standards. While these standards hold the promise of improving environmental management, they also pose clear threats to smallholder farmers in the developing world. Because of limited access to market information and meager assets,

developing- country producers are at risk of being excluded from the market as the role of these private standards increases. A key focus for USAID activities over the next 5 years will be to develop local human and institutional capacity to understand and adapt to these standards.

Improving the Health of Land, Water, Biodiversity, and Forest Resources

Natural resources—water, soil, forests, and biodiversity—provide the foundation for long-term agricultural productivity and economic growth. The unsustainable use of resources reduces competitiveness and increases the vulnerability of agro-enterprises to floods, droughts, pests, and other threats. Consistent provision of a sufficient quantity and quality of water is essential for the intensification of livestock and crop production. Forest and vegetative cover facilitate the replenishment of groundwater, moderate erosion and the destructive impact of severe weather, and create habitat for beneficial insects and pollinators. Biodiversity provides genetic resources for potential economic crops and can generate income through tourism and resource-based enterprises. To ensure the ongoing health of the natural resource base, USAID will work to increase water productivity, improve land management practices, and promote agricultural practices that conserve biodiversity.

Increasing water productivity will become more important over the coming decades as needs for domestic, industrial, and ecosystem management uses compete with agriculture. A variety of technologies hold the promise of increasing water productivity in agriculture. High-efficiency irrigation systems and water recycling and re-use for agro-processing reduce water consumption, maintain stream flow, and minimize water

pollution. Water harvesting—the capture and use of rainwater where it falls—allows for the productive use of excessive rainwater that would otherwise be lost as run-off and contribute to flooding. No-till and low-till agriculture reduce erosion and increase soil organic matter, thereby allowing better infiltration of water. Water-conserving crop species can produce under arid conditions while ‘reducing water demand. The development and promotion of a wide range of technologies and practices that improve water productivity will be an important element of USAID programs over the next 5 years.

Improving land management practices from the farm to the landscape scale also contributes to the improved health and ongoing productivity of the resource base. Practices that increase the soil organic matter such as composting, mulching, cover crops, and low-till agriculture provide a number of clear benefits that impact the long-term productivity of farmland. Soil high in organic matter is rich and soft and acts like a sponge. It allows better root penetration and water infiltration and retention, and improves the soil microbial community. Fertilizer efficiency is increased, as is drought resistance. Once organic matter is incorporated into the soil, its benefits are realized for many years. Erosion control practices, including contour farming, terracing, and establishment of hedgerows, retain rich topsoil on the field, and reduce siltation and pollution of waterways and aquatic ecosystems. When these measures are implemented on a landscape scale, they reduce vulnerability to severe flooding and drought and can mitigate otherwise disastrous effects of severe weather events.

Appropriate siting of crop and livestock operations and agro-processing facilities is another critical aspect in ensuring that

agricultural enterprises minimize their environmental impact and maximize competitiveness. On infertile land or steep slopes, tree crops, forestry, or wildlife management can often provide better returns on investment and cause less environmental harm than traditional cropping and livestock operations. Appropriate placement of agricultural processing facilities can avoid water contamination, limit logistical and transportation bottlenecks, and reduce liability. USAID will work with producers and processors to identify the most profitable, environmentally sound uses of land resources.

Over a billion people live in or around the world's most critical protected areas, jeopardizing the survival of biodiversity resources. Recent research highlights the potential for promoting agricultural practices that are profitable and contribute to the conservation of biodiversity.⁸ Strategies include the creation of biodiversity reserves that benefit local farming communities, developing habitat networks in non-farmed private and public lands, increasing productivity on existing farmland, and minimizing agricultural pollution. As the integration of agriculture and NRM activities proceeds, efforts will be made to promote practices that sustain biodiversity on farmland and across agricultural landscapes while providing new income streams and opportunities for producers.

Strengthening Agriculture and Natural Resource Policy and Governance

Ensuring that natural resources and ecosystems critical to agriculture are well managed requires effective institutions and policies that promote good governance. The last decade has seen a trend towards a greater recognition of citizens' environmental rights, and devolution of

authority from the national to the local level. Sound natural resource governance is concerned with the distribution, exercise, and accountability of authority over natural resources and directly affects agricultural viability. In strengthening policy and governance, USAID activities will help speed efforts to promote secure access to resources, practical procedural rights, and devolution of authority for natural resource decision-making.

Farmers are not likely to maintain, much less invest in, resources over which they do not have secure long-term claims. Effective land rights can take many forms, from regulated communal use of public resources to titled private ownership of land. The important element is that land users have confidence that they will be able to profit from any investments that they make to improve the health of the resource base. USAID will work to provide secure access to land and natural resources as the first step in supporting sound agricultural and NRM policies.

Procedural rights must also be strengthened so that rural communities have the power to hold planners and resource users accountable for their decisions and actions. USAID will promote substantive procedural rights, including access to information, decisionmaking processes, and recourse in matters related to natural resources. These rights ensure that individuals and community groups have a voice and influence in policy development and implementation related to natural resources upon which their livelihoods depend.

Finally, it is important to develop local human and institutional capacity to manage new-found responsibilities as decision-making authority over NRM is devolved from the national level. Local governments and institutions that existed under highly

centralized government structures will need new skills and experience to build the technical and management capacity to ensure equitable use of resources that maintains long term productivity.

Conclusion

Over the last four decades, our understanding of the complex relationship between productive agriculture and sound natural resource management has substantially evolved. It is now well understood that sound environmental management, economic growth, good governance, and human capacity building components all must be present and work together if the long term viability of agriculture is to be achieved. Over the next 5 years, USAID-supported activities will promote the guiding principles of sustainability and adaptive management and integrate the social, economic, and environmental elements necessary to ensure dynamic and effective agriculture programs in the developing world.

ANNEX ONE

BIFAD REPORT: ACTIVITIES AND RECOMMENDATIONS

The Board for International Food and Agricultural Development (BIFAD) was created in 1975 under Title XII “Famine Prevention and Freedom from Hunger” of the Foreign Assistance Act. The primary role of BIFAD is to advise the USAID Administrator on agricultural development priorities and issues and to monitor activities undertaken under Title XII. BIFAD members are appointed by the President. There are seven members, at least four of whom must be from the U.S. university community. The Board receives technical, administrative, and financial support through the Title XII Officer located in the Office of Agriculture in the Economic Growth, Agriculture, and Trade (EGAT) Bureau. BIFAD normally meets at least three times a year. All meetings are announced in the *Federal Register* and open to the public.

BIFAD did not meet during FY 2002. During the year, the Administration appointed a new Board. In July 2002, the White House announced the new BIFAD members and their terms of appointment.

BIFAD Members and Terms

M. Peter McPherson, Chair, 2002-2005
President, Michigan State University

Mike Deegan, 2002-2005
President and CEO, ACDI/VOCA

Stewart Iverson, Jr., 2002-2005
Majority Leader, Iowa State Senate

Anthony Laos, 2002-2005

President and General Manager, Stauffer Seeds

William DeLauder, 2002-2004
President, Delaware State University

Carol Lewis, 2002-2004
Interim Dean, School of Agriculture and Land Resources Management, University of Alaska

Sharron Quisenberry, 2002-2004
Dean, College of Agriculture, Montana State University

BIFAD held its inaugural meeting in October 2002. An initial focus of the Board will be renewing Agency emphasis on long-term degree training in agriculture.

Strategic Partnership for Agricultural Research and Education (SPARE)

SPARE is a sub-committee of BIFAD. During FY 2002 three meetings were convened to:

- (1) Review the Soil and Bean/Cowpea Collaborative Research Support Programs (CRSPs), November 29-30, 2001;
- (2) Discuss the Scientific Liaison Officers Program, June 19-20, 2002; and
- (3) Discuss CRSP Transaction Costs, September 25- 26, 2002.

In June 2002, USAID requested that BIFAD undertake three sub-sector reviews on

fisheries/aquaculture, integrated pest management, and sustainable agriculture. BIFAD tasked the reviews to SPARE, which undertook the reviews in FY 2003.

In August 2002, USAID Administrator Andrew Natsios appointed Winfrey B. Clarke, Virginia State University, and John B. Swanson, USAID EGAT, to three-year terms on SPARE beginning in October 1, 2002. Emmanuel Acquah, University of Maryland-Eastern Shore, and Terry Hardt, USAID EGAT, completed their three-year terms on September 30, 2002.

SPARE recommendations to BIFAD on its review of Soil and Bean/Cowpea CRSPs:

- *SPARE recommended that the Bean/Cowpea CRSP be approved for a five-year reauthorization and that the Soil Management CRSP be approved for a five-year extension.*

SPARE's recommendations to BIFAD on its discussion of the Scientific Liaison Officer Program:

- *SPARE recommended that USAID convene an expert panel of university and International Agriculture Research Center (IARC) scientists to consider current modes including the Scientific*

Liaison Officer Program and other modes that need to be identified to strengthen university-IARC collaboration and develop mechanisms to implement the most feasible ones.

- *Currently, good, efficient, and effective mechanisms to forge stronger university ties to the IARCs are not available. This is a major constraint, but one that can be overcome. SPARE recommended that USAID and the U.S. university community, both public and private, seriously consider additional ways to further new and ongoing collaborative relationships.*

SPARE's recommendation to BIFAD on its discussion of CRSP Transaction Costs:

- *Based on SPARE's discussion with the CRSP Program Directors, the critical issues regarding CRSP transaction costs are of the following relative priority: (1) Procurement/Funding; (2) Reporting and Communication; and (3) Oversight. SPARE recommended that BIFAD communicate to the Agency the urgency of reviewing and clarifying these issues. Furthermore, SPARE proposed that BIFAD/SPARE work with both the Agency and the CRSP Council to resolve them as appropriate.*

ANNEX TWO

AGRICULTURAL OBLIGATIONS

OVERVIEW

During FY 2002, USAID supported agricultural activities in over 70 countries to address the strategic priorities of its regional and pillar bureaus. The regional bureaus are sub-Saharan Africa (AFR), Asia and the Near East (ANE), Europe and Eurasia (E&E), and Latin America and the Caribbean (LAC). The pillar bureaus, established in FY 2002 as part of the Agency's reorganization, include Economic Growth, Agriculture, and Trade (EGAT); Democracy, Conflict, and Humanitarian Assistance (DCHA); and Global Health (GH). Agricultural obligations were made by the four regional bureaus, EGAT and DCHA, and the Policy and Program Coordination (PPC) Bureau. The obligations and activities of the regional and pillar bureaus are summarized below. PPC funds were used to support food security and agricultural research and analysis.

Approximately \$421 million was invested during FY 2002 in activities that address the

objectives of the 1961 Foreign Assistance Act and Title XII through the following funds:

Development Assistance (DA)

Economic Support Fund (ESF)

Assistance to Eastern Europe and Baltics

Assistance to Independent States of Former Soviet Union

Andean Counterdrug Initiative

Approximately 46 percent of the total came from DA funds, while 33 percent came from the ESF. Total agricultural obligations from these funds increased by 39 percent over FY 2001 allocations (Table 1), and were the largest amount obligated to agriculture since 1995. Additional agricultural activities were supported by DCHA through Title II (P.L. 480) and the International Disaster Assistance account.

TABLE 1. USAID AGRICULTURAL OBLIGATIONS BY BUREAU, 1996-2002 (THOUSAND ¹\$)

| Bureau² | FY 1996 | FY 1997 | FY 1998 | FY 1999 | FY 2000 | FY 2001 | FY 2002 |
|---------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| AFR | 80,123 | 80,186 | 77,912 | 83,161 | 97,734 | 102,187 | 113,602 |
| ANE | 93,569 | 56,828 | 131,906 | 130,420 | 113,710 | 86,122 | 117,345 |
| E&E | 32,109 | 31,525 | 34,200 | 40,938 | 32,432 | 48,800 | 85,279 |
| LAC | 32,682 | 28,958 | 27,478 | 34,867 | 34,341 | 24,864 | 61,862 |
| EGAT ³ | 64,040 | 42,663 | 37,738 | 38,777 | 29,518 | 35,171 | 35,272 |
| DCHA ⁴ | 5,302 | 2,736 | 4,239 | 1,941 | 2,083 | 5,957 | 6,900 |
| PPC | 0 | 1,858 | 2,300 | 3,100 | 406 | 414 | 545 |
| Total | 307,825 | 244,754 | 315,773 | 333,204 | 310,224 | 303,515 | 420,805 |

EGAT

ECONOMIC GROWTH, AGRICULTURE, AND TRADE BUREAU

The Bureau for Economic Growth, Agriculture, and Trade (EGAT) was officially established on November 4, 2001.

EGAT, one of the Agency's three pillar bureaus, provides Agency technical leadership and expertise to missions

¹ Data for FY 1996 through FY 2001 are from FY 2001 Title XII Report to Congress. Data for FY 2002 are from the bureaus. Obligations include new obligating authority from Development Assistance and other appropriations, carryover, and recoveries. The table does not include International Narcotics Control funds, funds for sustainable agriculture coded as environment activities, funds from the International Disaster Assistance account, or funds obligated under Title II (P.L. 480).

² AFR–Africa; ANE–Asia and Near East; E&E–Europe and Eurasia; LAC–Latin America and the Caribbean; EGAT–Economic Growth, Agriculture, and Trade (name changed from Global in FY02), DCHA–Democracy, Conflict, and Humanitarian Assistance (name changed in FY02 from Bureau for Humanitarian Response); PPC–Policy and Program Coordination

³ Global Bureau began obligating for sustainable agriculture activities coded as environment activities in FY 1992. The Global Bureau's obligations for sustainable agriculture activities coded "environment" were \$16,195,000 in FY 1996, \$11,457,359 in FY 1997, \$15,478,017 in FY 1998, \$13,161,056 in FY 1999, \$27,880,711 in FY 2000, \$25,470,000 in FY 2001, and \$25,500,000 in FY 2002.

⁴ Not included are DCHA obligations under Title II (P.L. 480) or from the International Disaster Assistance account (see Table 8).

worldwide in the areas of broad based economic growth, agricultural development, environmental management, energy, urban development, biodiversity, education, training, information technology for development, and trade and marketing.

In addition, the Bureau directly manages programs and projects that provide support for global and transboundary research and innovation as well as program mechanisms (such as Indefinite Quantity Contracts) that permit all bureaus and missions rapidly to access technical expertise and training services. The Bureau also houses the Agency's Women in Development (WID) Office, whose goal is to mainstream gender considerations throughout USAID's programs.

The Collaborative Agricultural Biotechnology Initiative (CABIO), a new EGAT initiative, was announced at the "World Food Summit: *five years later*," held in Rome in June 2002. CABIO's goal is to help developing countries access and manage biotechnology to reduce poverty and hunger. Programs will focus on biotechnology crop development and training, building policies and capacity for science-based regulations, examining biosafety in the broader context of economics, environment, science, and trade issues, and building biotechnology

leadership among African and Asian countries (see Annex 3 for more details).

Agricultural and environmental research continues to be a focal activity to address the Agency's objective of improving economic growth in developing countries. The Consultative Group on International Agricultural Research (CGIAR) and the Collaborative Research Support Programs (CRSPs), both managed by the EGAT Bureau, are major USAID-funded programs that work in close collaboration with U.S. university and agribusiness communities, the international agricultural research system, and interested NGOs. These programs have had a significant global impact on the development of improved crop and livestock technologies and contribute materially to scientific advances in agriculture and natural resource management.

Funding obligations for agricultural activities carried out in the EGAT Bureau amounted to approximately \$60.8 million in FY 2002, including sustainable agriculture activities coded as environmental activities. Agricultural research and education through the CGIAR and the CRSPs accounted for approximately 80 percent of EGAT's funding.

TABLE 2. ECONOMIC GROWTH, AGRICULTURE AND TRADE BUREAU AGRICULTURAL OBLIGATIONS (THOUSAND \$)⁵

| | FY 2000 | FY 2001 | FY 2002 |
|--|----------------|----------------|----------------|
| Consultative Group on International Agricultural Research (CGIAR) | 26,600 | 26,650 | 26,900 |
| Collaborative Research Support Programs (CRSPs) | 20,050 | 21,246 | 22,443 |
| International Fertilizer Development Center (IFDC) | 2,000 | 2,300 | 2,300 |
| Biotechnology and Biodiversity Interface Program (BBI) | 0 | 2,000 | 0 |
| Partnerships for Food Industry Development (PFID) | 0 | 1,000 | 1,575 |
| Agricultural Biotechnology for Sustainable Productivity (ABSP) ⁶ | 39 | 2,377 | 0 |
| Collaborative Agriculture Biotechnology Initiative (CABIO) | 0 | 0 | 2,800 |
| Food Security II (FSII) | 400 | 400 | 400 |
| Agricultural Policy Analysis Project III (APAP III) | 114 | 61 | 0 |
| Rural and Agricultural Incomes with a Sustainable Environment (RAISE) ⁷ | 252 | 281 | 131 |
| Program Support ⁸ | 1,772 | 1,728 | 2,695 |
| BIFAD Support ⁹ | [150] | [150] | 0 |
| Child Survival Initiative | 872 | 0 | 0 |
| Utah State Directive | 0 | 1,000 | 0 |
| Dairy Directive | 800 | 1,598 | 1,528 |
| Sub-Total | 52,899 | 60,641 | 60,772 |
| Additional Dairy ¹⁰ | 4,500 | 0 | 0 |
| Total | 57,399 | 60,641 | 60,772 |
| (Minus sustainable agriculture activities coded as environment activities) | [27,881] | [25,470] | [25,500] |
| Total | 29,518 | 35,171 | 35,272 |

⁵ *This table includes obligations coded as environmental activities

⁶ ABSP II included in CABIO obligations in FY 2002.

⁷ In FY 2000 and FY 2001, includes Environment Center contribution to joint financing of this activity.

⁸ Includes RSSA staff, AAAS staff, short term technical assistance, and purchase orders

⁹ Included in Program Support

¹⁰ Funds transferred from Management Bureau's Budget Office.

AFR

AFRICA BUREAU

In Africa, agriculture is the cornerstone of USAID's development objectives that target poverty and hunger reduction. The overall goal of the Africa Bureau is to implement an environmentally sound agricultural growth program to reduce hunger, food insecurity, and poverty. As a testament to this commitment, agricultural programs are expanding. Since FY 1998, expenditures have increased from \$77.9 million to \$113.6 million and the number of countries receiving agricultural assistance has increased from 15 to 23. From FY 2001 to FY 2002, agricultural funding increased by 11 percent (Table 3). Crucial to implementation of the programs are partnerships with U.S. universities, international organizations, local and regional organizations, NGOs, the private sector, and governments.

The rationale for an increase in agricultural funding is clear. Per capita food production in the region has steadily declined in the last five years. It is estimated that a third of the world's malnourished people reside in sub-Saharan Africa, and in the future that fraction is expected to increase. Infectious diseases such as malaria, tuberculosis, and HIV/AIDS are already inflicting high mortality rates and draining labor from food production. Approximately 80 percent of the African poor live in rural areas and depend on agriculture for their income. Between 40 and 60 percent of GDP comes directly from agriculture, and approximately 40 percent of Africa's export earnings are derived from agriculture. Despite the central role of this sector, the continent is characterized by very low investment rates in agriculture and

natural resources (e.g., 1 percent of GDP in Africa, 15 percent in Asia). The U.S. government supports the vision of African agriculture articulated by Africans through the joint efforts of the New Partnership for Africa's Development (NEPAD) and the Forum for Agricultural Research in Africa (FARA). These initiatives emphasize that increases in agricultural growth are necessary for economic growth, poverty alleviation, and food security in Africa.

The Presidential Initiative to End Hunger in Africa (IEHA), launched at the 2002 World Summit on Sustainable Development, is a testament to the U.S. government's commitment to meeting the UN Millennium Development Goal of halving the number of severely impoverished and malnourished people by 2015. Through this initiative, the U.S. government has pledged to increase by over 25 percent its financial commitments to boost agricultural productivity and trade in Africa. These investments will focus on harnessing science and technology and using the power of market forces to increase smallholder agricultural productivity. This initiative will focus first on three countries and regions: Mali in West Africa, Mozambique in Southern Africa, and Uganda in East Africa.

Recognizing the importance of agricultural research to improving food security in Africa, USAID supports many research institutions and consortia. The African-led and managed FARA is one such organization. USAID provided core support in the amount of \$12 million for FARA's Sub-regional Research Organizations in East, West, and Southern Africa. In addition,

USAID provided support for strengthening National Agricultural Research Institutions in Ethiopia, Kenya, Mali, Mozambique, Nigeria, and Uganda. The Bureau continues its investments in the CGIAR and affiliated International Agricultural Research Centers (IARCs), as well in the CRSPs that engage the U.S. and African university communities in agricultural research. Details on the accomplishments of these research programs can be found in Annex 5.

Consistent with the vision of NEPAD, USAID provides support to strengthen the capacity of African governments and private-sector groups to design programs, policies and strategies to support agricultural growth. For example, USAID is helping the governments of Ghana, Kenya, Mali, Mozambique, Nigeria, and Uganda to build policy frameworks and investment plans for the agricultural sector.

In 2002, two new programs were initiated to support policy and trade expansion. Through IEHA, USAID funded a new effort led by the International Food Policy Research Institute (IFPRI) to establish a Strategic Analysis and Knowledge Support System (SAKSS) for African agriculture to assist planners and decision makers. A second new initiative is Trade for African Development and Enterprise (TRADE). This multi-year trade capacity-building program will promote regional integration and cooperation by strengthening the ability of African countries and businesses to develop their export trade, including trade in agricultural products. Regional Hubs for Global Competitiveness will be located at USAID's regional missions in West, East, and Southern Africa. With TRADE assistance, African businesses should be able to take advantage of greater market access promoted by the African Growth and Opportunity Act (AGOA).

Combining its strengths with the resources and capabilities of other actors in agricultural development, USAID established 18 new Global Development Alliances (GDAs) in Africa during FY 2002, providing approximately \$20 million to leverage more than \$37 million of funding from alliance partners. Partners include U.S. and foreign universities, businesses, and private voluntary organizations (PVOs). These alliances include a regional program for agribusiness in sustainable African natural plant products, food industry development in Ghana, competitiveness projects for livestock, cassava, and other crops in Nigeria, a sustainable tree crops program in West Africa, and support for the development of a livestock trade commission to jointly serve livestock traders in the Greater Horn of Africa and the Arabian Peninsula.

In Burundi, Somalia, and southern Sudan, agricultural programs are increasing where possible, given ongoing conflict in each country and U.S. statutory limitations. While programs in these countries continue to be managed through the Regional Economic Development Services Office for East and Southern Africa (REDSO/ESA) in Nairobi, FY 2002 marks the first time in several years that these countries have had their own lines in the budget for agricultural activities (Table 3). In stable areas of southern Sudan, USAID continues to work to improve the country's capacity to meet its own food needs by restoring and increasing traditional food production, increasing market demand and access for locally produced food, and providing access to startup capital, thereby increasing economic growth and incomes. In Burundi, assistance to the coffee sector continues in areas least affected by conflict.

TABLE 3 AFRICA BUREAU AGRICULTURAL OBLIGATIONS (THOUSAND \$)¹¹

| COUNTRY | FY 2000 | FY 2001 | FY 2002 |
|---|----------------|----------------|----------------|
| Angola | 0 | 1,443 | 2,703 |
| Benin | 0 | 0 | 320 |
| Burundi | 0 | 0 | 3,000 |
| Democratic Republic of Congo | 500 | 3,000 | 1,000 |
| Eritrea | 2,500 | 3,528 | 2,320 |
| Ethiopia | 3,000 | 5,694 | 3,444 |
| Ghana | 7,000 | 3,775 | 3,671 |
| Guinea | 0 | 500 | 0 |
| Kenya | 6,700 | 6,797 | 6,035 |
| Liberia | 2,399 | 3,270 | 2,665 |
| Madagascar | 349 | 500 | 0 |
| Malawi | 7,885 | 4,493 | 4,109 |
| Mali | 5,391 | 6,179 | 6,373 |
| Mozambique | 10,715 | 11,798 | 10,317 |
| Nigeria | 7,349 | 4,700 | 6,896 |
| Rwanda | 4,900 | 3,884 | 2,874 |
| Senegal | 0 | 762 | 2,400 |
| Sierra Leone | 0 | 1,000 | 1,116 |
| Somalia | 0 | 0 | 800 |
| South Africa | 2,400 | 3,699 | 5,591 |
| Sudan | 0 | 0 | 3,000 |
| Tanzania | 2,000 | 0 | 1,957 |
| Uganda | 12,500 | 5,867 | 8,121 |
| Zambia | 5,500 | 4,181 | 5,601 |
| Zimbabwe | 699 | 0 | 200 |
| REGIONAL | | | |
| REDSO/ESA & GHAI ¹² | 3,300 | 3,297 | 7,157 |
| Southern Africa | 3,100 | 0 | 4,000 |
| West Africa Regional Program | 2,000 | 2,559 | 1,629 |
| Africa-Wide (AFR/SD & DP) ¹³ | 7,546 | 21,261 | 11,303 |
| Initiative to End Hunger in Africa | 0 | 0 | 5,000 |
| TOTAL | 97,733 | 102,187 | 113,602 |

¹¹ Data for FY 2000 and FY 2001 are from FY 2001 Title XII Report to Congress. Data for FY 2002 are from the Africa Bureau. This table does not include Title II (P.L. 480) funds or International Disaster Assistance funds, which can be significant for some countries (see Tables 7 and 8).

¹² Regional Economic Development Support Office/East and Southern Africa; Greater Horn of Africa Initiative (GHAI).

¹³ Africa Bureau, Office of Sustainable Development and Office of Development Planning.

ANE

ASIA AND THE NEAR EAST BUREAU

Funding for agriculture in the ANE Region (excluding food aid) steadily declined from a high of over \$300 million in the early 1980s to below \$90 million in 2001. In FY 2002, however, this downward trend was reversed and ANE obligated \$117 million for a variety of agriculture-related activities (Table 4). Of this, almost \$100 million was funded from ESF, including all agricultural obligations to East Timor, Egypt, Jordan, Lebanon, and West Bank/Gaza.

In FY 2002, USAID returned to Afghanistan after an absence of many years. Agriculture is the key to the growth of the Afghan economy. USAID has been at the forefront of international efforts to revitalize the agricultural sector by addressing the basic factors of agricultural production—seeds, fertilizer, irrigation systems, basic farming implements, and technical assistance.

ESF supports a wide range of agricultural activities in countries of key interest to the United States. In Egypt, ESF supports agricultural policy reform, agribusiness development, and increased export competitiveness for agricultural products. Thanks to USAID, Egyptian agriculture is now more responsive to domestic and international market forces, less constrained by government involvement in production and marketing decisions, and more open to competition. In Jordan, ESF supports improved water resource management. In Lebanon, ESF resources are supporting various rural development activities, including a focus on women's cooperatives and rehabilitation of farm-to-market roads.

Total FY 2002 DA funding for agriculture in the ANE Region was \$17.6 million. This funding was used to improve agricultural policy in Indonesia, support the growth of agribusiness and improved management of aquatic and tropical forest resources in Bangladesh, encourage adoption of high-value agricultural and fish products and improved production technologies in the Philippines, and to support production of high-value agricultural crops and sustainable management of community forests in Nepal. In Afghanistan, the DA allocation is aimed at enhancing the food security and income of the rural population through activities to increase agricultural production and develop improved linkages between farmers and markets.

Other programs not strictly coded as agricultural nevertheless address agricultural issues in ANE. For example, USAID/Mongolia has helped revitalize the Agricultural Bank, with its network of more than 300 rural branches providing much-needed finance in rural areas. The USAID-funded Gobi Initiative has provided significant support to livestock producers in rural Mongolia, putting agriculture at the center of USAID/ Mongolia's economic growth strategic objective. In Morocco, although no funding was directly allocated to agriculture, water management activities helped organize farmers into water users associations to promote more efficient irrigation practices. In Sri Lanka, a number of activities in competitive markets involve crops such as rubber, spices, coir, and tea. The EGAT Bureau also funds research in

biotechnology, integrated pest management and IARC activities in selected ANE countries that are not attributed to ANE agricultural obligations.

TABLE 4 ANE BUREAU AGRICULTURAL OBLIGATIONS (THOUSAND \$)¹⁴

| Country | FY 2000 | FY 2001 | FY 2002 |
|------------------|------------------|---------------|----------------|
| Afghanistan | 0 | 0 | 6,920 |
| Bangladesh | 3,303 | 2,050 | 1,500 |
| East Timor | 0 | 8,072 | 10,000 |
| Egypt | 72,291 | 53,019 | 63,475 |
| India | 0 | 337 | 1,187 |
| Indonesia | 4,093 | 4,975 | 1,363 |
| Jordan | 27,390 | 14,469 | 14,850 |
| Lebanon | 2,250 | 0 | 6,000 |
| Mongolia | 1,596 | 0 | 0 |
| Nepal | ** ¹⁵ | 500 | 500 |
| Philippines | 500 | 1,000 | 1,150 |
| West Bank/Gaza | 2,287 | 0 | 5,400 |
| Regional Program | 0 | 1,700 | 5,000 |
| Total | 113,710 | 86,122 | 117,345 |

E & E

EUROPE

AND

EURASIA

BUREAU

USAID's agricultural assistance to the countries of the Former Soviet Union (FSU) and Central and Eastern Europe (CEE) is

focused on agribusiness and trade development and improving quality standards of local products for both local

¹⁴ Data for FY 2000 and 2001 are from the FY 2001 Title XII Report to Congress; data for FY 2002 are from the ANE Bureau. This table does not include Title II (P.L. 480) or International Disaster Assistance funds, which can be significant for some countries (see Tables 7 and 8).

¹⁵ ** Funds for agricultural activities in Nepal were coded under environment in FY 2000

and export markets. More limited assistance is provided to land and agricultural reform, institutional and organizational development, and agricultural credit. In numerous FSU and CEE countries, agricultural assistance programs are raising the competitiveness of local products. Through training, new product development, establishment of grades and standards, and improved market information systems, farmers and processors are becoming better equipped to meet the quality and other market requirements for a wider variety of food and consumer items. In Albania, Armenia, Azerbaijan, Georgia, Kosovo, Moldova, and Romania, market-chain strategies are yielding benefits to both consumers and producers as constraints that prevent higher productivity, add to costs, or prevent linkages with domestic or foreign markets are systematically addressed. In FY 2002, agricultural obligations increased by 36 percent compared to FY 2001 (Table 5). In general, the increase funds the upscaling of ongoing projects into phases of greater activity. One major exception was in Uzbekistan, where agricultural obligations jumped from \$1.2 million in FY01 to \$13.6 million in FY02. This increase was for the one-time funding of irrigation system rehabilitation near the border with Afghanistan. In Albania, Kosovo, and Moldova, USAID support has been vital to the development of networks of agribusiness and producer organizations. In Kosovo, associations of agricultural input dealers, flour millers, and poultry producers formed the Alliance of Kosovo Agribusinesses. By 2002, the annual aggregate volume of business of these organizations surpassed \$46 million. In Albania, building on an earlier success in establishing commodity-specific trade associations, USAID assisted in the development of an 18-member Federation of Agricultural Trade Associations that is now an active player in

the agricultural policy formulation process and participates in official negotiating delegations for free trade agreements. And

TABLE 5 E&E BUREAU AGRICULTURAL OBLIGATIONS (THOUSAND \$)¹⁶

| Country | FY 2001 | FY 2002 |
|---|---------------|---------------|
| Albania | 2,300 | 7,923 |
| Armenia | 10,300 | 7,450 |
| Azerbaijan | 700 | 4,350 |
| Bulgaria | 800 | 450 |
| Croatia | 0 | 3,800 |
| Federal Republic of Yugoslavia & Serbia | 1,000 | 1,715 |
| Georgia | 3,500 | 6,918 |
| Kazakhstan | 1,300 | 949 |
| Kosovo | 0 | 3,973 |
| Kyrgyzstan | 1,500 | 3,146 |
| Macedonia | 3,200 | 3,144 |
| Montenegro | 500 | 0 |
| Moldova | 5,500 | 7,034 |
| Romania | 1,600 | 3,488 |
| Russia | 6,800 | 555 |
| Tajikistan | 400 | 5,696 |
| Turkmenistan | 100 | 300 |
| Ukraine | 4,800 | 9,291 |
| Uzbekistan | 1,200 | 13,644 |
| Central Asian Republics Regional | 0 | 1,000 |
| Central & Eastern Europe Regional | 2,600 283 | |
| Eurasia Regional | 700 | 170 |
| Total | 48,800 | 85,279 |

in Moldova, members of the 14 regional

¹⁶ FY 2001 data from FY 2001 Title XII Report, FY 2002 data provided by the E&E Bureau. This table does not include Title II (P.L. 480) funds or International Disaster Assistance funds, which can be significant for some countries (see Tables 7 and 8).

agricultural producers associations formed with USAID-funded assistance now represent about one-third of the farmland in that country. With USAID financing, 44 Moldovan farm stores and six farm service centers were opened during FY 2002. In addition to providing inputs, twelve of the

stores are providing output marketing channels, and the volume of farm store business is approaching \$2 million annually, with over 75,000 farmers being served. The six farm service centers have a business volume of over \$5 million annually.

L A C

L A T I N A M E R I C A A N D T H E C A R I B B E A N B U R E A U

While there have been some recent improvements in the economic and social well-being of people living in some Latin America and Caribbean (LAC) countries, the region as a whole faces challenges in adapting to global markets, tougher competition, and lower prices for the region's principle agricultural exports and in addressing accelerating rates of environmental degradation. The Summit of the Americas continued to influence USAID's core program. In light of the benefits of the North American Free Trade Agreement (NAFTA), the promise of the Central American Free Trade Agreement (CAFTA), and the potential for a hemispheric Free Trade Area of the Americas (FTAA) in 2005, a window of opportunity exists for countries in the LAC region to expand and diversify their economies so that more of the population can enjoy higher standards of living.

LAC regional and bilateral programs have primarily concentrated on deepening democracy, assisting sub-regional trading blocs with trade matters (e.g., WTO compliance and the development of the FTAA and CAFTA frameworks), improving the institutional infrastructure to help the poor access markets, conserving the region's biological resources, improving health policies and services, promoting educational reform, and advancing development

cooperation opportunities. These efforts have led to more complementary trade policies and procedures and to environmental and labor legislation that is tied to international commitments. The region's sustainable agricultural efforts have fueled growth in Bolivia, El Salvador, Guatemala, Haiti, Honduras, and Nicaragua and have protected the region's environment and natural resources. USAID provided assistance to small farmers in the poorer countries to enable them to respond to and access high-value niche markets, strengthen producer organizations, secure access to assets through land titling, and develop rural enterprises. A new program, the Regional Quality Coffee Program, got underway in FY 2002. Its goal is to assist countries compete in the high-quality segment of the coffee market.

In FY 2002, successes in agricultural development were observed throughout the LAC region. Most impressive are the increases in the market value of agricultural products. For example, In El Salvador, the mission's core agricultural program continues to promote environmentally sound agricultural practices and crop diversification toward high-value horticultural and fruit products. USAID assistance provided to rural organizations and individual farmers helped increase sales by nearly \$800,000 during FY 2002. In Honduras, the Agribusiness Development

Center increased the value of exports of the five main seasonal crops (cucumber, squash, watermelon, honeydew, and mango) by almost \$4 million in FY 2002.

In the Andean valleys of Bolivia, higher farm incomes, reduced post-harvest losses, better market acceptance and a wider market window are among the improvements realized in the first year of efforts by the Market Access and Poverty Alleviation Project (MAPA), which focused on onion production. By adopting improved systems for curing, drying, selecting, classifying, storing, and packaging their onions, farmers

reduced post-harvest losses by 40 to 80 percent and improved shelf life from three to four months. Household annual income increased by 38 percent, from \$1,034 to \$1,428 in the targeted area. USAID/Peru's Poverty Reduction and Alleviation activity also resulted in increased agricultural production by linking farmers to improved internal and external markets, leading to an increase in sales of \$7.5 million. This activity covers an area of roughly 4,000 hectares in the jungle and highland sections of Peru and directly benefits low income families.

TABLE 6 LAC BUREAU AGRICULTURAL OBLIGATIONS (THOUSAND \$)¹⁷

| Country | FY 2000 | FY 2001 | FY 2002 |
|--------------------------------|----------------|----------------|----------------|
| Bolivia | 0 | 1,575 | 1,000 |
| Dominican Republic | 0 | 0 | 100 |
| Ecuador | 550 | 0 | 0 |
| El Salvador | 2,533 | 2,105 | 2,650 |
| Guatemala | 8,175 | 4,180 | 3,822 |
| Haiti | 6,826 | 7,900 | 4,900 |
| Honduras | 978 | 1,943 | 800 |
| Jamaica | 2,170 | 0 | 0 |
| Nicaragua | 5,929 | 5,165 | 5,690 |
| Peru | 5,920 | 1,396 | 1,300 |
| Regional Programs | 1,260 | 600 | 4,600 |
| Andean Counter-Drug Initiative | na | na | 37,000 |
| Total | 34,341 | 24,864 | 61,862 |

¹⁷ Data for FY 2000 and FY 2001 are from the FY 2001 Title XII Report, data for FY 2002 are from the LAC Bureau. This table does not include Title II (P.L. 480) funds or International Disaster Assistance funds, which can be significant for some countries (see Tables 7 and 8), or International Narcotics Control (INC) funds currently coded as Economic Support Fund (ESF). Andean Counter-Drug Initiative funds obligated to agriculture were not reported prior to FY 2002

DCHA

BUREAU FOR DEMOCRACY, CONFLICT, AND HUMANITARIAN ASSISTANCE

DCHA supports agricultural activities through its Office of Foreign Disaster Assistance (OFDA), its Office of Food for Peace (FFP), and its Office of Private and Voluntary Cooperation (PVC). These offices coordinate USAID's rapid responses to natural disasters and human-caused crises, assist with rehabilitation and disaster preparedness, and promote opportunities for peace, democracy, and economic growth. Non-profit partners and international organizations, such as the UN Food Program, are critical to the success of DCHA's programs

FFP

OFFICE OF FOOD FOR PEACE

Food security is often the most fundamental concern facing the poorest people in developing countries. The world's 840 million hungry people, including 180 million malnourished children, are the focus of USAID's development (non-emergency) food aid programs.

The U.S. Public Law 480 (P.L. 480) Title II development food aid program constitutes the single largest source of USAID funding focused on food security. It enjoys substantial support from a unique combination of political, agricultural, commercial, and voluntary nongovernmental sectors. Title II activities promote more productive and diversified farming systems, improve post-harvest management and marketing of crops, provide microfinance credit for seeds, fertilizers and other inputs, and promote improved management of natural resources.

In FY 2002, over \$1 billion was channeled through Title II programs, of which \$428.5 million was for development activities and \$597 million for emergency activities. More

than 84 food security-related development programs in 28 countries were implemented in cooperation with U.S. PVOs and the World Food Program (WFP). Approximately 83 percent of Title II development resources support activities to improve household nutrition and agricultural productivity, the priority technical areas of intervention in the Agency's *Food Aid and Food Security Policy Paper*.

About 38 percent of Title II development resources, approximately \$162 million, supported agricultural and natural resource management activities. Community-level programs work with smallholder farmers, providing technical assistance and training to promote sustainable farming practices, more productive and diversified farming systems, and improved post-harvest management and marketing. Many of the Title II Cooperating Sponsors work in close collaboration with international and national agricultural research centers to help disseminate and adapt locally appropriate technologies.

During FY 2002, priority was given to programming Title II development activities in sub-Saharan Africa and South Asia—the most chronically food-insecure regions of the world—and to targeting the most food-insecure and vulnerable households and individuals within the countries where Title II programs are implemented.

TABLE 7 TITLE II (PL 480) EMERGENCY AND DEVELOPMENT FUNDING THROUGH THE FOOD FOR PEACE OFFICE: TWENTY LARGEST RECIPIENT COUNTRIES IN FY 2002 (THOUSAND \$).¹⁸

| Country | Emergency | Development | Total |
|-----------------------|----------------|----------------|------------------|
| Afghanistan | 159,472 | 0 | 159,472 |
| India | 0 | 99,524 | 99,524 |
| Ethiopia | 45,985 | 40,608 | 86,593 |
| Angola | 69,224 | 7,798 | 77,022 |
| Sudan | 60,675 | 0 | 60,675 |
| South Africa | 46,394 | 0 | 46,394 |
| Peru | 0 | 37,035 | 37,035 |
| Uganda | 15,332 | 12,775 | 28,107 |
| Tajikistan | 26,227 | 0 | 26,227 |
| Zimbabwe | 25,716 | 0 | 25,716 |
| Sierra Leone | 24,554 | 0 | 24,554 |
| Bangladesh | 0 | 24,178 | 24,178 |
| Haiti | 2,462 | 20,690 | 23,152 |
| Guatemala | 2,651 | 18,852 | 21,503 |
| Bolivia | 0 | 20,416 | 20,416 |
| Kenya | 4,668 | 15,558 | 20,226 |
| Mozambique | 4,791 | 14,879 | 19,670 |
| Nicaragua | 898 | 14,236 | 15,134 |
| Indonesia | 4,990 | 5,670 | 10,660 |
| Pakistan | 2,262 | 2,871 | 5,133 |
| Subtotal | 496,301 | 335,090 | 831,391 |
| Other** ¹⁹ | 100,740 | 93,433 | 194,173 |
| Total | 597,041 | 428,523 | 1,025,564 |

¹⁸ Data are from the Office of Food for Peace.

¹⁹ ** Includes other countries, Institutional Strengthening Assistance (ISA) grants, unallocated preposition, plus other unallocated funds

- *In Bolivia, growth in household consumption and farmer incomes occurred through the sale of seed material, expansion into vegetable cultivation, effective use of supplemental irrigation water, and safe storage of surplus harvests. Preliminary estimates indicate that each dollar spent under the Title II agricultural productivity program produced a six-dollar gain in net income for beneficiary households.*
- *USAID/Nicaragua organized a \$2.5 million coffee relief initiative for farmers, including \$1.5 million of Title II food through Food for Work activities and \$1 million of mission funding. Coffee farmers were dealt a double blow in 2002 by drought and the steep decline in international coffee prices. In a country where coffee generates employment for about 32 percent of the agricultural workforce, low coffee prices can wreak devastating social and economic consequences. The activities supported by these Title II funds are helping to maintain 30 percent of the total coffee area in Nicaragua. The work done includes pruning, weeding, fertilization, and other labor-intensive practices necessary to maintain the health of coffee plants.*
- *In Rwanda, Catholic Relief Services' agricultural technology transfer program has been extremely successful and popular among local farmers, many of whom are women. New sorghum varieties, along with improved cultivation technologies, have led to earlier maturing and higher yields than the local varieties. As a result, farmers now have ample sorghum for their own food needs as well as surpluses to sell for additional cash income.*

OFDA

OFFICE OF FOREIGN

The mandate of the USAID Office of Foreign Disaster Assistance (OFDA) is to save lives and reduce human suffering. While the majority of its international disaster assistance funding supports response to natural and human-caused disasters, a significant portion of its funds are spent on improving food security and supporting agricultural recovery. Funding agriculture-related programs through U.S.-based PVOs and other organizations is one way that OFDA improves food security for vulnerable populations in disaster-prone areas of the world.

Effective disaster preparedness requires developing strategies in advance to mitigate and prevent loss of food security. OFDA supports such measures. In arid and semi-arid regions, for example, programs that provide drought-resistant, locally adapted cultivars of staple crops can help maintain productivity at an acceptable level during times of water stress, reducing the need for foreign food aid. The development of early warning systems and regional strategies for coping with drought can also help reduce food insecurity in arid zones.

In FY 2002, OFDA spent \$100 million on a range of agriculture-related activities in 21 countries, focusing primarily on crop productivity and smallholder seed systems in disaster-prone regions of Africa (Table 8). Sudan was the largest recipient of OFDA funding in Africa, receiving \$15.3 million. OFDA allocated \$56.5 million to help rebuild war-ravaged Afghanistan.

DISASTER ASSISTANCE

TABLE 8 OFFICE OF FOREIGN DISASTER ASSISTANCE OBLIGATIONS ALLOCATED TO FOOD SECURITY AND AGRICULTURE IN FY 2002 (THOUSAND \$)²⁰

| Countries | Amount |
|--------------------------------|---------|
| AFRICA | |
| Angola | 3,370 |
| Burundi | 3,495 |
| Democratic Republic of Congo | 5,510 |
| Guinea | 375 |
| Kenya | 285 |
| Malawi | 2,615 |
| Sierra Leone | 3,567 |
| Sudan | 15,303 |
| Zambia | 1,539 |
| Zimbabwe | 2,594 |
| ASIA & NEAR EAST | |
| Afghanistan | 56,474 |
| China | 50 |
| Indonesia | 3,857 |
| Laos | 50 |
| Philippines | 100 |
| Thailand | 25 |
| Vietnam | 85 |
| Syria | 50 |
| Tonga | 25 |
| EUROPE & EURASIA | |
| Tajikistan | 809 |
| LATIN AMERICA/CARIBBEAN | |
| Bolivia | 50 |
| GLOBAL PROGRAMS | 150 |
| TOTAL | 100,378 |

²⁰ Data are from the Office of Foreign Disaster Assistance.

PVC

OFFICE OF PRIVATE AND VOLUNTARY COOPERATION

The Office of Private and Voluntary Cooperation (PVC) supports U.S. PVOs and their local partners' efforts to strengthen NGOs, NGO networks and other local counterparts' capacity to deliver services to underserved communities. Agriculture is one such service sector. Agricultural projects are funded through the John Ogonowski Farmer-to-Farmer (FTF) Program, the Matching Grant Program, and the Cooperative Development Program (CDP).

The FTF Program, initially authorized by Congress in the 1985 Farm Bill, was reauthorized through FY 2007 as part of the 2002 Farm Bill. Congress renamed the program the "John Ogonowski Farmer-to-Farmer Program" to honor the pilot of American Airlines flight #11, which was hijacked and crashed into the World Trade Center on September 11, 2001.

The FTF Program funds people-to-people technical assistance. Its purpose is to assist farmers in increasing food production and distribution by improving the effectiveness of farming and marketing operations. The program relies on volunteer expertise from U.S. farms, land-grant universities, cooperatives, private agribusinesses, and non-profit farm organizations to respond to the needs of farmers and organizations in developing and transitional economies. Since the program's inception, volunteers have been recruited from all 50 states and the District of Columbia.

In FY 2002, \$10.6 million in FTF grants supported 36 country and two regional programs in the Horn of Africa and in Latin America and the Caribbean. The following

examples illustrate the program's impact on the processing and marketing of agricultural products.

- *As a result of FTF's work with local extension agents and coffee growers, 11 district coffee producers associations formed units of the Nepal Coffee Producers' Association, with a combined membership of more than 3,000 growers. The District Cooperative Federation (DCF) in Gulmi installed a 20-kg capacity roasting machine and began marketing roasted coffee for the local market. The processing plant serves more than 500 growers. DCF exported 10 metric tons of coffee beans to Japan in FY 2002, as compared to 3.5 metric tons in 1999. Overall, 1,236 growers (44 percent of Nepal's coffee growers) have benefited either as FTF trainees or via improved technologies promoted by the FTF Program and local partners.*
- *In Armenia, beginning in 1999, FTF Caucasus introduced artificial insemination and new genetics to goatherds. As a result of the volunteer's recommendations, USDA established and funded a goat-breeding center. FTF has sent six volunteers to the center to work with 14 hosts on breed improvement, milk selection, and cheese production. As a result of these interventions, cheese, milk, and goat sales have increased by 29 percent (\$287,000), and host revenues have increased by 38 percent (\$96,000).*
- *The Fantsuam Foundation is a Nigerian NGO that works with women's groups in*

rural communities. Micro-credit is one of its primary activities. Within six months of receiving FTF volunteer technical assistance, the foundation increased its clients from 80 to 500. The assistance, which consisted of training in computerized record keeping, resulted in improved accuracy and record keeping. Implementation of a new registration system and annual membership fees increased the foundation's revenues by \$500 and reduced dependence on benefactors. Fantsuam is now applying for funding for loans and creating partnerships with other micro-finance organizations. The assistance will improve Fantsuam's chances of receiving grants to increase its capital for loans to some 2,000 women farmers who are currently on the waiting list.

The Matching Grant (MG) Program encourages U.S. PVOs to expand successful community-based programs or initiate new projects in sectors that are consistent with USAID policies and priorities. USAID provides matching grants to U.S. PVOs to help them improve their planning and management systems and technical competencies. The MG Program also funds U.S. PVO partnerships that help build the capacity of local NGOs and community-based organizations. The program is competitive and requires a private dollar for-dollar cash match from the grant recipient. For FY 2002, the MG Program provided \$2.8 million in USAID funds for agricultural projects, and over \$2.8 million in private cash funds.

Examples of MG programs supporting agricultural development in FY 2002 include the following:

- *With MG support, Strategies for International Development (SID), in collaboration with local NGOs, is*

helping communities in the Altiplano region of Bolivia and Peru to restore soil and pasture fertility ecologically in order to boost productivity and increase farm incomes. The program has three key elements: (1) assist NGOs with program planning, design, implementation, and evaluation, (2) foster NGO collaboration and competition to innovate and improve performance, and (3) partner with NGO federations already committed to assisting local NGOs.

- *In FY 2002, The Mountain Institute (TMI) began a five-year program in Nepal and Peru whose aim is to encourage economically and ecologically sustainable production and marketing of non-traditional forest products. It also seeks to strengthen community-based ecotourism management and especially the capacity of women, local NGOs, and community-based organizations to plan and undertake conservation-linked income generation and biodiversity protection. TMI conducts participatory surveys of environmental stresses and sustainable livelihood opportunities, collecting and monitoring biophysical and social impact indicators while also building TMI field staff capacity to coordinate complex multi-stakeholder coalitions.*

The Cooperative Development Program's goal is to support the development and strengthening of effective, self-reliant, and democratic cooperatives in developing and transitional economies. Program resources are channeled through U.S. cooperative development organizations (CDOs). In the agricultural sector, CDOs work across commodities in the areas of credit, supply, marketing, and agribusiness. For example:

- CDP support for coffee cooperatives through the National Cooperative Business Association and Cooperative League of the USA (CLUSA) has produced more than \$7 million in export sales. In Sulawesi, coffee cooperatives procured and processed 7.4 million pounds of export-grade “green” coffee during the first five seasons. By exporting to niche markets, the cooperatives have enabled farmers to receive higher and more stable prices. In El Salvador, CLUSA’s work has produced more than \$2.5 million in export contracts for organic bunch onions, lettuce, baby carrots, sweet corn, fruits, and other vegetables. Working with Cooperative Resources International, a major U.S. breeders’ cooperative, CDP efforts in Nicaragua have resulted in several thousand improved cows with mature offspring producing 200 percent more milk than other local dairy cows. A silage bagging system has significantly reduced losses. The bottom line has been substantial income increases for participating producers.*
- ACDI-VOCA’s Cooperative Development Program has helped strengthen the management and marketing of agricultural commodity cooperatives in Brazil and Mozambique. ACDI-VOCA volunteers, drawn from U.S. agribusiness cooperatives, have provided technical assistance and training directly to cooperatives as well as through intermediaries that support cooperative development. The program has produced a training manual series to meet management and commodity marketing objectives. In Kyrgyzstan, the program has helped create and expand agricultural credit services in Osh, Chui, and Jalalabad.*

ANNEX THREE

INTERNATIONAL MEETINGS

This year was remarkable for the number of international summits and meetings relevant to the U.S. agricultural development agenda. These included:

- *World Trade Organization (WTO) Ministerial meeting in Doha (November 9-13, 2001),*
- *Monterrey Conference on Financing for Development (March 18-22, 2002),*
- *World Food Summit: five years later (June 10-13, 2002), and*
- *World Summit on Sustainable Development (WSSD) (August 26-September 4, 2002).*

Discussions and actions at these meetings both reaffirmed and influenced USAID agricultural policies. Coinciding with many of these events, the U.S. government announced major new development initiatives.

World Trade Organization Ministerial in Doha

In November 2001, members of the WTO launched a new round of negotiations in Doha, Qatar. The negotiating agenda adopted has been labeled the “Doha Development Agenda” because WTO members recognized that:

1. continued multilateral trade liberalization is necessary to accelerate growth and poverty reduction in developing countries, and

2. specific steps must be taken to help developing countries take advantage of the opportunities created by trade liberalization.

The Doha agenda reinforces a strategic focus of USAID assistance, since it calls for renewed efforts by donors to help developing country members of the WTO to participate more effectively in trade negotiations, comply with and implement existing trade agreements, and improve their economies’ competitiveness in the global economy. Doha agricultural negotiations are expected to reduce subsidies, tariffs, and non-tariff barriers to exports of agricultural commodities that are especially important to developing country economies.

See:

www.wto.org/english/thewto_e/minist_e/min01_e/mindecl_e.htm

The Monterrey Conference on Financing for Development

The UN-sponsored International Conference on Financing for Development was held in Monterrey, Mexico. Prior to the Monterrey conference, President Bush announced a “New Compact for Development.” Under the Compact, the United States pledged to increase its core development assistance by 50 percent over the next three years, resulting in a \$5 billion annual increase over current levels. These additional funds are for a new Millennium Challenge Account (MCA). The MCA will target its activities to developing countries that demonstrate a strong commitment to ruling justly, investing in people, and promoting

economic freedom, which are the foundations for broad-based, lasting development.

See:

www.usaid.gov/mca/.

The World Food Summit: **five years later**

The goals of this meeting were to review the advances made toward halving world hunger since the 1996 World Food Summit and plan ways to accelerate progress toward this goal. One of the major outcomes was the endorsement of an Anti-Hunger Declaration by all 182 participating countries, which pledged to act as an “International Alliance against Hunger” as they renewed their commitment to halve the number of hungry people in the world by 2015.

See:

www.fao.org/worldfoodsummit/english/index.html.

The U. S. delegation was led by Secretary of Agriculture Ann M. Veneman, USAID Administrator Andrew Natsios, and Under-Secretary of State for Economic, Business, and Agricultural Affairs Alan P. Larson. The United States played a leading role in assessing progress to date and providing a framework for addressing future challenges of hunger, malnutrition, and famine.

This was most clearly demonstrated in the U.S. Position Paper “World Food Summit: **five years later**” which was presented at the summit

See:

www.fas.usda.gov/icd/summit/wfsposition.pdf.

The paper outlines the actions that the United States will take, together with partner countries and other donors, to cut hunger in half by 2015. These actions include:

- *Improving policy frameworks,*
- *Boosting agricultural science and technology,*
- *Developing domestic market and international trade opportunities,*
- *Securing property rights and access to finance,*
- *Enhancing human capital,*
- *Protecting the vulnerable, and*
- *Improving food security in the United States.*

In her official remarks at the summit, Secretary Veneman announced USAID’s Collaborative Agricultural Biotechnology Initiative (CABIO) to help developing countries access and manage biotechnology to reduce poverty and hunger. The program focuses on conducting research and technology development, strengthening public institutions to use research and develop policy to promote biotechnology’s safe use, and developing private-sector capacity to help integrate biotechnology into local food systems. The initiative integrates a number of USAID efforts, including the following new programs:

- *Agricultural Biotechnology Support Project II (ABSP II), led by Cornell University, to collaborate with U.S. and international partners on biotechnology crop development and training;*
- *Program for Biosafety Systems, to build policies and capacity for science-based regulations and to examine biosafety in the broader context of economics, environment, science, and trade issues;*

- *Biofortified Crops to Combat Micronutrient Deficiency Program, a joint program of the CGIAR and U.S. and international universities, to address micronutrient malnutrition by raising Vitamin A, iron, and zinc content in crops. This program employs traditional breeding and nutrition analysis and education, along with biotechnology tools.*
- *Building biotechnology leadership among African and Asian countries through bilateral programs in research, policy, and capacity building.*

The World Summit on Sustainable Development

The WSSD was held for the purpose of identifying accomplishments and areas where further efforts are needed to implement Agenda 21 and other outcomes of the 1992 Rio de Janeiro UN Conference on Environment and Development. The goal was to focus on the challenges and opportunities related to sustainable development that have emerged since 1992 and on action-oriented decisions where further efforts are needed. A guiding principle of the summit was that economic development, social development, and environmental protection are interdependent and mutually reinforcing components of sustainable development, echoing the development approach of USAID.

See:

www.usaid.gov/about/wssd/initiatives.html.

Announced at this international summit were four presidential “signature” initiatives relevant to agricultural development. USAID is a key partner in each. These are:

- *Initiative to End Hunger in Africa (IEHA). IEHA focuses on building an*

African-led partnership to cut hunger and poverty. The primary objective of the initiative is to increase agricultural growth and rural incomes rapidly and sustainably in sub-Saharan Africa through Agricultural Action Plans building on the following six focal themes for maximum coordinated impact:

- *Science and technology;*
- *Agricultural trade and market systems;*
- *Community-and producer-based organizations;*
- *Human capital, infrastructure, and institutions;*
- *Vulnerable groups and countries in transition; and*
- *Environmental management.*

Initial efforts will concentrate on a key country in each of three regions: Uganda in East and Central Africa, Mozambique in Southern Africa, and Mali in West and Central Africa. These countries are leaders in policy reform, public investment, and government commitment to agricultural growth and poverty reduction. They are representative of the key economic and agricultural characteristics of their regions. These countries also have the greatest potential for rapidly influencing regional agricultural productivity and economic growth through trade and technology.

See:

www.usaid.gov/about/wssd/africa.html.

- *Congo Basin Forest Partnership. Launched by Secretary of State Colin Powell, this partnership aims to promote economic development, poverty alleviation, improved governance, and*

natural resource conservation in the Congo Basin, recognizing the interdependence of economic development, social development, and environmental protection in the quest for sustainable development.

See: www.usaid.gov/about/wssd/congo.html.

Specifically, this partnership will:

- *Promote the application of sustainable natural resource management practices across landscapes composed of logging concessions, community management forests and protected areas;*
- *Improve forest and natural resource governance by developing and strengthening policies and laws that support local management, such as community-based natural resource management; and*
- *Build capacity to monitor forests and other natural resources throughout the region at the local, national, and regional levels.*

In addition to the U.S. government, partners include the governments of the Congo Basin (Cameroon, Central African Republic, Democratic Republic of the Congo, Equatorial Guinea, Gabon, and Republic of Congo), the G-8 nations, the European Union, NGOs, and corporate interests. At the WSSD, the U.S. government proposed to invest up to \$53 million over four years (2002-2005) in this partnership.

- *Water for the Poor Initiative. This public-private initiative seeks to improve the sustainable management of freshwater resources and accelerate and expand international efforts to achieve the UN Millennium Declaration Goal of cutting in half by 2015 the proportion of*

people who are unable to reach or to afford safe drinking water. The United States will work with other governmental and non-governmental partners in three key areas: (1) broadening access to clean water and sanitation services, (2) improving watershed management, and (3) increasing the efficiency of water use in industrial and agricultural activities. The United States proposed a total of up to \$970 million to be invested from 2003-2005. It is anticipated that these investments will mobilize more than \$1.6 billion for water-related activities.

See:

www.usaid.gov/about/wssd/water.html.

- *Clean Energy Initiative. This public-private partnership will draw upon the resources and expertise of USAID, the Department of Energy, and the Environmental Protection Agency, other governments, international organizations, NGOs, and businesses to increase access to modern energy services, improve the efficiency of current energy use, and change unhealthy patterns of energy use.*

See:

www.usaid.gov/about/wssd/energy.html.

Another U.S. government initiative featured at the WSSD was the Geographic Information for Sustainable Development (GISD) initiative, a joint USAID-U.S. State Department-led international alliance.

- *The GISD initiative aims to apply a new generation of earth observation data, state-of-the-art geographic information systems-linked technologies, and field-tested geographic knowledge to sustainable development problems in target areas in Africa and elsewhere in developing countries. The alliance collaborates with many partners in and*

outside of Africa. The goal is to help local, national, and international agencies, particularly those working in Africa, better address long-term challenges, such as disaster mitigation, natural resource management, trade competitiveness, and poverty reduction.

See:

www.opengis.org/gisd.

In 2002, USAID and the State Department contributed about \$2 million to the initiative for training, capacity building, and technology transfer. In-kind services, technical assistance, software, hardware, and an array of data products have been contributed by the Environmental Systems Research Institute, the OpenGIS Consortium, and many of its private sector members, as well as by U.S. government agencies such as NASA, NIMA, USGS,

NOAA, and the Forest Service. The value of leveraged funds is more than three times the value of the USAID and State Department contributions.

Finally, one of the key accomplishments of the WSSD was the launching of more than 300 voluntary partnerships. Each partnership will bring additional resources to support efforts to implement sustainable development, including agricultural development. These partnerships will engage governments, NGOs, intergovernmental organizations, and businesses in actions that will address the commitments made in Johannesburg: expanding access to water and sanitation; improving agricultural yields; protecting biodiversity; improving access to affordable, clean, and efficient energy; and improving ecosystem management.

ANNEX FOUR

NEW AGRICULTURAL ACTIVITIES

In FY 2002, USAID launched two new activities that have significant agricultural components: the Global Development Alliance and the Afghanistan Development Assistance Program.

See:

www.usaid.gov/gda/

and

www.usaid.gov/afghanistan/agriculture.html

Global Development Alliance

Recognizing the important and growing role of private companies, foundations, and other actors in development, USAID initiated a new model in 2002 to extend its reach and effectiveness in meeting development objectives by combining its strengths with the resources and capabilities of others. With the GDA as one of the four pillars under the FY 2002 Agency reorganization, USAID has fundamentally reoriented its vision of itself and the way it relates to its traditional partners and develops alliances with new ones.

The GDA represents an important business model, building upon the best of past activities and extending the use of public-private alliances throughout the Agency. The GDA offers an innovative vehicle for USAID to combine forces with private companies and others, developing public-private alliances that take advantage of the relative strengths of each party, thus greatly enhancing the delivery of assistance and positive impacts for poor people in the developing world. The GDA is the Agency's

commitment to change the way it implements its assistance mandate. It serves as a catalyst to mobilize ideas, efforts, and resources of the public sector, the private sector, and non-governmental organizations in support of shared objectives.

In FY 2002, 75 new public-private alliances were formed with total USAID funding of \$111 million. These alliances leveraged about \$380 million in non-governmental resources. Of these new alliances, 22 are classified as primarily related to agriculture, and a number of others have agricultural components. Some notable agricultural alliances formed in FY 2002:

- **Green Mountain Coffee Alliance.** *USAID's alliance with Green Mountain Coffee Roaster is helping small and medium-sized coffee producers and workers in Central America to adjust to the sharp drop in coffee prices in global markets. The alliance supports the development of coffee systems that are environmentally, socially, and economically sustainable. This will improve livelihoods and incomes for coffee farmers and their communities while maintaining a reliable supply of coffee in the range of qualities demanded by consumers.*
- **Faith-Based Agriculture Alliance.** *An alliance with the Foods Resource Bank (FRB) will foster sustainable food security in Africa's poorest communities. FRB is a recently formed NGO that works in partnership with U.S. farmers in the Midwest and 14 faith-based organizations. U.S. farmers donate land and equipment, urban churches donate*

cash for seeds and fertilizer, and the harvest is then sold for cash, which goes to fund community-based food security projects in Africa.

- **ChevronTexaco.** *USAID's alliance with ChevronTexaco will help in Angola's transition from a war-torn nation to one of stability and economic growth. This major alliance, in which Chevron-Texaco expects to commit at least \$10 million to joint activities with USAID, provides support and training for enterprise development and agriculture. The first activity will assist 150,000 Angolan families affected by civil war (former soldiers and internally displaced people) by providing, among other things, technical support and training to grow crops.*
- **Mali Sugar Alliance.** *USAID is working with the Government of Mali and F.C. Schaffer and Company, a Louisiana-based firm that specializes in the management of sugar factory operations, on the first steps toward the development of a \$270 million, 5000-job sugar plantation and processing plant in Mali. When completed, this operation will meet Mali's domestic needs for sugar and stimulate substantial economic growth for this poverty stricken but vibrant West African country.*
- **Mozambique Business Mentoring Alliance.** *In Mozambique, another of the poorest countries in the world, USAID is working with the NGO TechnoServe and U.S. businesses to mentor Mozambican agri-businesses, helping them grow into profitable enterprises that stimulate overall economic growth and employment. This program is already showing some striking early successes.*

Afghanistan

In January 2002, with the reopening of the U.S. Embassy in Kabul, USAID reactivated official assistance to Afghanistan. Agriculture is the largest and most important sector of the Afghan economy, with 70 percent of the population depending on it for their livelihood. However, 22 years of armed conflict, compounded by Taliban rule and the worst drought in memory, devastated the country's food production capacity and impoverished millions of farmers. Vulnerability remains high throughout the country, despite massive humanitarian relief efforts, a change in regime, and the presence of foreign military/peacekeeping forces.

USAID is helping to revitalize the rural economy by working to restore the country's ability to produce its own seed, promoting the cultivation of high-value crops, providing tools and other agricultural equipment, and developing a market-led seed and fertilizer distribution system. USAID's efforts are enabling Afghan farmers to re-establish production and increase their efficiency and profitability.

- *In FY 2002, USAID's programs helped increase food production and reduced the number of people dependent on food aid from approximately 10 million to 6 million.*
- *By providing fertilizer and improved wheat seed to over 110,000 farmers, USAID contributed to an 82 percent increase in wheat yields in the fall of 2002.*
- *USAID helped 18,000 Afghan farmers switch from opium poppy cultivation to high-value crops through the promotion of such crops as grapes, olives, peanuts, and cotton. Cotton production increased three-fold in the USAID program area.*

- *The commercial distribution system for agricultural inputs was bolstered by the distribution, through private channels, of over \$5.45 million of fertilizer.*

Additional new initiatives launched by USAID at major international meetings are described in Annex 3.

ANNEX FIVE

HIGHLIGHTS OF AGRICULTURAL ACCOMPLISHMENTS

Accomplishments in FY 2002 are presented in the following areas:

- I. Agricultural productivity
- II. Agribusiness, markets, and trade
- III. Agricultural policies and institutions
- IV. Rural development, including natural resource management

I. AGRICULTURAL PRODUCTIVITY

This section highlights projects and activities that engage an international community of scientists in increasing agricultural productivity in the developing world. These include activities designed to increase the quantity or quality of production of crops, fish, and livestock intended for human consumption. USAID supported activities have increased the efficiency of production by improving crop varieties and agricultural practices and by reducing losses to pests and pathogens. They have also improved the nutritional quality and storage characteristics of agricultural products. Additional increases in agricultural productivity have resulted from improvements in the production of animal feed and in health care for fish and animals. An integral part of these programs is technology transfer, including the development of human resources and institutional capacity within developing countries.

A. Partnerships with U.S. Universities

1. COLLABORATIVE RESEARCH SUPPORT PROGRAMS

Collaborative Research Support Programs (CRSPs) draw upon expertise from USAID, U.S. universities,

developing-country National Agricultural Research Systems (NARS), International Agricultural Research Centers (IARCs), U.S. agribusiness, private voluntary organizations (PVOs), developing-country colleges and universities, private agencies, and other U.S. federal agencies such as the USDA. The CRSPs address agricultural productivity and sustainability, food quality, and natural resource management in programs that benefit both developing countries and the United States. Reported here are activities that focus on increasing agricultural productivity.

Bean/Cowpea Collaborative Research Support Program

See: www2.isp.msu.edu/crsp/.

The Bean/Cowpea CRSP seeks to overcome malnutrition, stimulate economic growth, promote environmental stewardship, and improve the well-being of people, especially women and the poor, by generating technologies and knowledge that enhance the production, commercialization, and utilization of beans and cowpeas. Bean/Cowpea CRSP scientists use cutting-edge research and teaching technologies, including molecular tools of biotechnology,

to address production and utilization constraints in Latin America and Africa.

FY 2002 accomplishments related to agricultural productivity included:

- *Latin America and Caribbean Project. Two newly released improved small-red bean varieties, "Amadeus" and "Bribri," developed by Bean/Cowpea CRSP scientists at Zamorano, Honduras, in collaboration with the University of Puerto Rico, are growing rapidly in popularity among farmers and consumers in Central America. These varieties, which are adapted to the agro-ecological conditions found in the bean-growing areas of the region, have high-yield potential, BGYM (bean golden-yellow mosaic) viral resistance, and seed color and other quality traits preferred by consumers.*
- *East Africa Project. A novel seed-storage protein that confers resistance to bean weevils has been identified in a type of wild tepary bean by Bean/Cowpea CRSP scientists at Oregon State University and Sokoine University of Agriculture in Tanzania. These weevils (brucids) damage the dry bean grain during storage. Seed from crosses of the resistant type with normal tepary beans was shown to contain the novel storage protein and experience significantly reduced damage due to weevil feeding. Current research is focusing on making hybrids between tepary bean and common bean, using embryo rescue, in order to introduce a new source of insect resistance.*
- *West Africa Project. A Bean/Cowpea CRSP trainee at Purdue University identified two novel molecular markers for Striga resistance in cowpea. Striga, a parasitic weed which reduces the vigor*

of cowpea plants, contributes to low cowpea yields in West Africa. These molecular markers will enable breeders to identify new sources of genetic resistance to Striga in cowpeas and enable screening of lines without having to infect plants.

Integrated Pest Management Collaborative Research Support Program

See: www.ag.vt.edu/ipmcrsp.

The Integrated Pest Management (IPM) CRSP works with public and private host-country organizations to institutionalize IPM systems and to generate improved technologies and institutional changes that reduce crop losses, increase farmer income, reduce pesticide residues on export products, and improve IPM research and education capabilities.

- *Regionalization among the Asian IPM CRSP sites spread the benefits of productivity enhancing technologies across national borders. For example, grafting of bacterial wilt resistant rootstocks with scions of popular but susceptible varieties of eggplant and tomato was first implemented within the IPM CRSP in Bangladesh. After dramatically higher yields and profits were obtained, the Philippines site sent a team member to Bangladesh to learn these grafting techniques. Similar rates of success are now being obtained in the Philippines.*
- *The IPM CRSP has been instrumental in strengthening linkages and enhancing collaboration between host country universities and NARS with respect to IPM. This has facilitated research aimed at increasing the productivity of many crops. For example, in Uganda, the IPM CRSP helped strengthen collaboration*

between Makerere University and the National Agricultural Research Organization (NARO) on activities involving IPM of maize, sorghum, tomato, potato, cowpea, and groundnut.

- *The adoption of IPM methods is increasing the efficiency of production in countries such as Guatemala, where more than 600 vegetable farmers adopted IPM CRSP pest-management strategies for non-traditional crop production and report positive effects on economic and social well-being and on perceived sustainability of production. In Ecuador, IPM technology was developed for non-traditional fruits, such as babaco, naranjilla, tree tomato, and plantain, and for potatoes. IPM technology is being extended for the first time to numerous plantain producers. Net profits of plantain IPM adopters are twice those of farmers using other practices, including those recommended by export companies.*

International Sorghum and Millet Collaborative Research Support Program

See: intsormil.org/.

The International Sorghum and Millet (INTSORMIL) CRSP's main objective is to improve the production, marketing, and utilization of grain sorghum and pearl millet in developing countries and the United States, and to strengthen the capabilities of U.S. and developing-country institutions to generate, adapt, and apply improved technology to local conditions.

- *Lines of sorghum resistant to a midge that seriously reduces production were identified through research supported by INTSORMIL West Texas A&M University scientists in Niger. These lines will be used to provide West*

African farmers with sorghum varieties that will withstand insect pests, thus boosting crop yields.

- *In Ethiopia, INTSORMIL sorghum breeding research by scientists from Purdue University, Kansas State University, and Texas A&M University developed elite hybrids with potential for wide cultivation in the lowland areas of the country. Research on controlling the parasitic weed *Striga* resulted in an integrated package of production technologies that include tied-ridging for water conservation, nitrogen fertilization, and resistant sorghum cultivars that will boost sorghum production in the Horn of Africa.*
- *Research on the nutritional quality of sorghum supported by Purdue University scientists identified lines with high starch digestibility, as compared to levels in maize and rice. These sorghum cultivars will be valuable for use in weaning and other foods where high energy availability is important.*

Peanut Collaborative Research Support Program

See: www.griffin.peachnet.edu/pnutcrsp.html.

The goal of the Peanut CRSP program is to improve food safety, nutrition, and production efficiency; to adopt technologies; and to increase value through market development.

- *The profitability of peanuts was increased by 320 percent with cultivars generated by researchers at the University of North Carolina and Khon Kaen University in Thailand. These results come from the "first" crop of peanut in Thailand's multiple-cropping*

farming systems. Improved varieties are now grown by 84 percent of Thai farmers surveyed.

- *Preliminary data from Ghana collected by CRSP scientists from the University of Alabama at Birmingham and the University of Science and Technology in Ghana showed that, for the most aflatoxin-exposed third of subjects, components of the cellular immune system are suppressed. This result has profound implications for world health, since an estimated 4.5 billion people in developing countries are chronically exposed to aflatoxin.*
- *Producers of animals and dairy products increasingly protect animals from feed contaminated with aflatoxins using technologies discovered by Peanut CRSP researchers from Texas A&M and Senegal. The users of this technology are farmers in Central America, the Philippines, China, Indonesia, India, and the United States.*
- *CRSP research at Purdue University and in Ghana has contributed to the health claim for peanuts presented to the FDA by a consortium of U.S. industry associations. The research found that the high energy content of peanuts was compensated for by less frequent hunger and did not result in increased calorie intake. This finding is important as a basis for increasing peanut consumption both in food-deficit situations and in the United States, where obesity and diabetes are major health concerns.*
- *CRSP-supported research at the University of Georgia developed a way to produce high levels of resveratrol in peanuts. Resveratrol is the compound in red wine that helps prevent heart disease. High levels of resveratrol in*

peanut products could promote sales of this commodity worldwide.

Pond Dynamics/Aquaculture Collaborative Research Support Program

See: pdacrsp.oregonstate.edu/.

The Pond Dynamics/Aquaculture (PD/A) CRSP's main objectives are to define the principles underlying sound aquaculture management and improve practices that will provide increased employment and dependable, inexpensive sources of animal protein.

- *Results of a feed and fertilizer study in Kenya by PD/A scientists at Auburn University found that feeding Nile tilapia diets of locally available feedstuffs resulted in significantly higher weight gains than those produced by wheat bran and pig finisher pellets. The findings suggest that farmers could use feedstuffs found locally instead of using higher-cost prepared feeds.*
- *In the Philippines, the insulin-like growth factor gene in Nile tilapia was cloned by PD/A scientists from Florida International University. The isolation of a viable clone of this gene will allow PD/A CRSP researchers to conduct subsequent studies on the growth regulation of Nile tilapia. This will provide tools to monitor the regulatory mechanisms involved in growth and thus determine optimal grow-out conditions without having to wait for a complete growth cycle to be completed.*

2. COLLABORATIVE AGRICULTURAL BIOTECHNOLOGY INITIATIVE

In FY 2002, the Agency launched the Collaborative Agricultural Biotechnology

Initiative (CABIO), aimed at helping developing countries access and manage the tools of modern biotechnology as part of an integrated effort to improve agricultural productivity, environmental sustainability, and nutrition. CABIO addresses developing-country crop and animal production needs, strengthens public institutions to promote science-based decision making, supports public outreach activities, and fosters the development of the private sector to deliver and integrate biotechnology into local agri-food systems. Activities under CABIO include the Agricultural Biotechnology Support Project (ABSP) II, awarded to Cornell University, and the Program for Biosafety Systems (PBS). In FY 2002, the Biofortification of Crops Project was initiated, with a goal of improving the Vitamin A content of maize via genetic engineering and plant breeding. This project is a collaborative effort between U.S. universities, U.S. industry, the European Union, and partners in Africa.

3. RECOMBINANT RINDERPEST VACCINE PROJECT

Research by University of California-Davis scientists resulted in an effective and easily delivered heat- and UV light-stable recombinant vaccine for use in rinderpest disease eradication programs, particularly in sub-Saharan Africa, where sporadic outbreaks continue to occur, and in Asia, where the disease is endemic. The protocol for field testing was approved in 2002 by the Kenya Agricultural Research Institutional Biosafety Committee and the Government of Kenya's National Biosafety Committee. Confined field testing was successfully completed, and expanded field trials are being conducted in Kenya to evaluate vaccine performance under conditions of actual disease prevalence and in buffer zones surrounding "rinderpest-free" areas. In addition, the project developed a

diagnostic that distinguishes vaccinated animals from those that have been exposed to the virus. Thirty African scientists have been trained to make the diagnostic and use it in the field.

B. Partnerships with International Agricultural Research Centers

International Agricultural Research Centers (IARCs) have a long history of improving food security through the development of new varieties of crops upon which farmers in developing countries depend. Their focus includes livestock production, pest management, agroforestry, and the management of natural resources. Included in the IARCs are the 16 centers that make up the Consultative Group on International Agricultural Research (CGIAR), the International Fertilizer Development Center (IFDC), the International Center for Insect Physiology and Ecology (ICIPE), and the Asian Vegetable Research and Development Center.

1. CONSULTATIVE GROUP ON INTERNATIONAL AGRICULTURAL RESEARCH

See: www.cgiar.org.

USAID continues to fund the agricultural research carried out by the 16 IARCs that make up the CGIAR. CGIAR's mission is to contribute to food security and poverty reduction in developing countries through research, partnerships, capacity building, and policy support, promoting sustainable agricultural development based on environmentally sound management.

American researchers are active in the CGIAR system and make up the largest single nationality grouping within it. Four of the centers are headed by Americans, and 24 Americans serve as trustees at the 16

centers. In addition, American scientists based at U.S. universities and other advanced research institutes were involved in over 80 cooperative research and development programs with the CGIAR. Each center allocates 8 percent of its annual USAID institutional core funding for collaboration with the U.S. research community.

An American associated with the CGIAR, Dr. Pedro Sanchez, Director General of the International Center for Research in Agroforestry until 2001, was honored with the World Food Prize in 2002. Dr. Sanchez was cited for his groundbreaking contributions to reducing hunger and malnutrition throughout the developing world by transforming depleted tropical soils into productive agricultural lands. Highlights of CGIAR agricultural productivity activities in FY 2002 include:

- *The Future Harvest Consortium to Rebuild Agriculture in Afghanistan provided technical assistance for reviving agriculture, a vital sector of Afghanistan's economy. The consortium, with major support from USAID, supplied seeds for growing bread and durum wheat, barley, lentil, chickpea, and forage legumes—all tested for their adaptation to specific growing conditions in Afghanistan. The Future Harvest partners were able to supply these seeds because they had been gathered and stored in genebanks over the past several decades. These activities highlight the importance of genebanks in preserving biological diversity for producing new varieties as well as for supplying adapted seed to farmers after wars and natural disasters.*
- *The amount of nitrogen fertilizer used in rice fields can be reduced when farmers use a leaf color chart (LCC) to*

determine plant nitrogen status. Research supported by the International Rice Research Institute (IRRI) at four locations in China demonstrated that nitrogen fertilizer use could be reduced by 30 percent without reducing rice yield. Because leaf color is influenced by the amount of nitrogen in a plant, the LCC can be used by farmers to determine when their rice crops require fertilization. In Bangladesh, the LCC was "calibrated" for six rice varieties commonly grown in that country, and extension personnel were trained in the use of the LCC in fertilizer management.

2. UNIVERSITY AND INTERNATIONAL AGRICULTURAL RESEARCH CENTERS LINKAGE PROGRAM

The University/International Agricultural Research Centers Linkage Program was initiated in 1998 to address eight specific constraints to increasing incomes and improving child nutrition. Partnerships between U.S. land-grant institutions and IARCs were developed to tackle these issues. Completing its work in FY 2002 was Texas A&M University's "Biosystematics of African Fruit Flies and their Parasitoids" project with the International Center for Insect Physiology and Ecology. Results of this collaborative project include the following:

- *Kenyan researchers received hands-on training in the systematics of both fruit-infesting tephritid flies and their natural enemies (parasitic wasps) used in biological control. In addition, workshops and training sessions were held for technicians and field workers.*
- *Several new species of fruit fly were discovered during fruit sampling*

programs in which 1733 fruit samples were processed by Kenyan team workers. Additionally, over 20 different species of the genus Ceratitis were collected and members of this genus were reared from a total of 18 plant families.

II. AGRIBUSINESS, MARKETS, AND TRADE

Globalization, trade liberalization, and new market niches are creating new opportunities for income generation through agricultural trade. Integrating farmers and agricultural enterprises in the developing world into the global economy can be a powerful force for economic growth and poverty reduction. There is vast potential for farmers and agricultural enterprises to penetrate new market niches and increase their share in domestic, regional, and international markets. To promote economic growth, reduce poverty, and sustain support for trade liberalization, developing countries must be able to take advantage of the opportunities created by trade. To do so, more emphasis needs to be placed on market-led rural development by strengthening the institutions responsible for standards and quality control, ensuring the enforcement of contracts, and improving access to market information.

Through its Title XII and other development partners, USAID has been working to help build the institutions, scientific and technical know-how, and human capacity throughout the developing world to enable farmers and agribusinesses to capture regional and global trade opportunities. Agency programs address agribusiness and access to markets by drawing upon the expertise and experience of both U.S. universities and private sector organizations.

A. Partnerships with U.S. Universities

1. COLLABORATIVE RESEARCH SUPPORT PROGRAMS

Through collaborations among the Collaborative Research Support Program (CRSP) partners, the following programs address market development and access, in addition to agricultural productivity and sustainability and natural resource management. Reported here are activities that focus on market-related issues.

The Broadening Access and Strengthening Input Market Systems Collaborative Research Support Program

See: www.basis.wisc.edu.

The Broadening Access and Strengthening Input Market Systems (BASIS) CRSP identifies policies and strategies to promote economic growth through improved access to and efficient use of land, water, labor and financial markets. Interdisciplinary research of rural factor markets and their role in enhancing or constraining growth can inform policy that seeks to foster rural economies in which growth is a sustainable foundation for broad rural prosperity. By helping make markets work for all, the BASIS CRSP seeks to improve the quality of life for people in rural areas of the developing world.

- *Research in Kenya and Madagascar documented links between poverty, market access, and environmental degradation, particularly of soil quality. Preliminary findings indicate that farmers who have access to vertically integrated financial markets (where the processor supplies inputs on credit to farmers in return for a provision of the crop) are able to improve soil quality*

and increase household income more than those that do not have such access. These findings suggest that policies that strengthen financial markets benefit both poor farmers and the environment.

- *A participatory irrigation network is most likely to reduce conflicts among water users and promote sustainable use of water resources in agriculture. BASIS scientists studying the Mwea Irrigation Scheme in Kenya found that such a network, involving all water users and stakeholders, was an effective management structure for delivery, pricing, and cost recovery of water resources.*

In FY 2002, BASIS CRSP began five new longterm research activities designed to improve policy and institutional mechanisms that will broaden access to land, credit, water, and labor markets in project countries, thus helping to increase incomes and food availability for the poor while promoting sustainable resource management. These activities and their primary locations are:

- *Building Assets for Sustainable Recovery and Food Security (Ethiopia and Honduras),*
- *Constraints to Growth in Russian Agriculture,*
- *Promoting Equitable Access to Water Resources (Malawi),*
- *Poverty Traps and Resource Degradation (Kenya and Madagascar), and*
- *Innovating Institutions to Help Land Reform Beneficiaries (South Africa and Kyrgyz Republic).*

Bean/Cowpea Collaborative Research Support Program

See: www2.isp.msu.edu/crsp/.

In addition to its focus on increasing agricultural productivity, this CRSP has also addressed the commercialization of bean and cowpea products. In West Africa, Bean/Cowpea CRSP food scientists have made major strides in the development of nutritious, value-added cowpea-based food products. At the University of Ghana-Legon, a cowpea/peanut yogurt and a cowpea-fortified breakfast cereal have been developed. Food scientists at the University of Georgia have developed processes for the preparation of retail-ready *akara* (cowpea fritters). In addition, a prototype snack food product prepared from rice and cowpea flour has been developed and an agreement signed with Frito Lay, Inc. to investigate scale-up and commercialization.

Global Livestock Collaborative Research Support Program

See: glcrsp.ucdavis.edu/index.html.

The Global-Livestock (GL) CRSP's overall objective is to improve food security and quality of life in developing countries through collaborative partnerships that focus on sustainable improvements in animal agriculture. In addition to its results in the area of natural resources management, the GL CRSP had accomplishments in agricultural business development, markets, and trade in Central Asia. For example, in Kazakhstan and Kyrgyzstan, GL CRSP scientists:

- *investigated wool production and marketing to analyze the relationships between the wool market participants and evaluate the different bargaining*

capacities, needs, and problems of the producers, traders, and buyers;

- *explored markets and marketing options for the different grades and quantities of wool produced in the project areas; and*
- *produced a video and educational material on American wool pools and grading systems to inform Central Asian wool farmers about production, sorting, grading, pooling, and wool marketing practices.*

Integrated Pest Management Collaborative Research Support Program

See: www.ag.vt.edu/ipmcrsp.

One goal of the Integrated Pest Management (IPM) CRSP is to reduce pesticide residues on agricultural products for export, thus increasing access to global markets for farmers in developing countries. An example of this is the IPM CRSP's technical support to the Environmental Quality Laboratory (EQL) in Mali. The support has provided pesticide safety education to peri-urban vegetable growers and strengthened the EQL to the level that it is now effective in monitoring pesticide residues on green beans destined for export to Europe. Without such a laboratory, exports would not be possible.

The Pond Dynamics/Aquaculture Collaborative Research Support Program

See: pdacrsp.oregonstate.edu/.

In FY 2002, the Pond Dynamics/Aquaculture (PD/A) CRSP had accomplishments in agricultural business development. For example, in Kenya, PD/A CRSP University of Arkansas researchers collaborated with Moi University scientists to develop enterprise budgets for both tilapia

monoculture and tilapia polyculture. The project has produced enterprise budgets and financial statements for business plans to be used as guides for fish farmers, which will facilitate access to credit for new fish farmers. Information developed in this project not only provides farmers with appropriate tools to show profitability, but also helps lending institutions assess the viability of aquaculture projects and reduce the rate of failure in loan repayment.

2. THE FOOD SECURITY II COOPERATIVE AGREEMENT WITH MICHIGAN STATE UNIVERSITY

See: www.aec.msu.edu/agecon/fs2/.

The Food Security II (FSII) program carries out a broad array of projects related to food security. Included are applied food and agricultural policy research (see next section) as well as research and capacity-building activities related to agricultural markets and trade in Africa. In FY 2002, market-related activities included:

- *In Mali, FSII contributed to the improvement of food systems through better market information. Its PASIDMA (Projet d'Appui au Système d'Information Décentralisé du Marché Agricole) project reinforced this goal through the implementation of key activities including the equipping of 16 field stations with radio/ phone/e-mail connections to allow real-time data communication among all 24 local market information units across the country, training enumerators in the use of new equipment and in computer use for data entry and preparation of local market reports, and training both local enumerators and local radio announcers in the basics of understanding how agricultural markets work.*

- *The FSII/PASIDMA project supported the exchange of market information in West Africa through its support of the West African Agro-Entrepreneurs Business Network. The network identifies opportunities for specific trades across countries and publicizes them through the regional market information network. In addition to supporting meetings of both the regional and national traders networks in 2002, the joint network-PASIDMA activities led to the establishment of a new cattle market on the Malian-Guinean border.*

B. Partnerships with International Agricultural Research Centers

1. INTERNATIONAL FERTILIZER DEVELOPMENT CENTER

See: www.ifdc.org/.

The goal of the International Fertilizer Development Center (IFDC) is increasing agricultural productivity in a sustainable manner through the development and transfer of effective, environmentally sound plant nutrient technology and agricultural marketing expertise. With USAID funding and in collaboration with the CGIAR centers, IFDC works to improve household food security, achieve sustainable agricultural production systems, improve resource utilization, and stimulate market-based agro-enterprise development. FY 2002 highlights include:

- *In Azerbaijan, IFDC's work to improve agricultural inputs and marketing provided business and technical training to agricultural input dealers. This work is setting the stage for a trade association of agricultural input dealers to establish a market-based agricultural inputs distribution system that will result*

in increased availability of inputs to farmers and increased access to credit, information, and business and technical skills for agricultural enterprises.

- *In Kyrgyzstan, a pilot project in the Ferghana Valley is supporting the development of agricultural inputs dealers and working to increase agricultural production through the use of improved technologies. The work is laying the groundwork for improvements in policies, laws, and regulations to stimulate private-sector investment in agriculture. The project is breathing new life into Kyrgyzstan's agricultural sector and providing support for the Association of Agribusinessmen of Kyrgyzstan.*
- *In Malawi, IFDC's Agricultural Input Markets Development Project is establishing a vibrant private sector-led agricultural inputs supply and marketing system to improve the performance of the agricultural sector. The project has designed and set up a market information system on agricultural input market conditions.*

C. Other Agency Activities

1. AFRICA TRADE AND INVESTMENT INITIATIVE

See: www.afr-sd.org/ATRIP.htm.

With one-tenth of the world's population, sub-Saharan Africa accounts for only one-fiftieth of the world's trade. Africa's exports have been growing in recent years and many major transnational corporations see the continent as a promising site for investment. Yet several obstacles, such as trade barriers and the lack of information in most African nations regarding market conditions and investment opportunities, stand in the way

of increased investment and expanded trade. Targeted U.S. government investments and expertise can make a real contribution in Africa's business and trade dynamics. This is what drives the Africa Trade and Investment Policy (ATRIP) Program, part of the President's Economic Growth and Opportunity Initiative. The ATRIP program funds and advises projects with the potential to transform Africa's trade capabilities, working directly in 13 African countries and in several other African countries through regional ATRIP programs. Highlights in FY 2002 include:

- *West Africa: Building Capacity for Agricultural Marketing of Farmer Cooperative Products. In Ghana and Senegal, USAID-funded activities undertaken by the USDA, the Federation of Southern Cooperatives, and the Opportunities Industrialization Centers International with local African cooperative groups worked to improve understanding of and promote entry into international marketing activities.*
- *West and Southern Africa: Policy Approaches to International Sanitary and Phytosanitary Standards and Implementation. USAID-supported programs carried out by the USDA's Foreign Agricultural Service responded to concerns expressed by African countries and U.S. exporters over safety issues with commodities from both animal and plant sources. This program included food-safety assessment training and workshops on sanitary and phytosanitary standards and led to the posting of USDA Animal and Plant Health Inspection Service (APHIS) specialists in three sites in Africa.*
- *Senegal: Building Trade in Horticultural Commodities with the United States. USAID funding assisted the University*

of Minnesota's efforts to help Senegal export selected fresh fruits and vegetables to the United States during seasons when other supplies are low, while at the same time helping U.S. horticultural equipment companies to find markets for their products in Senegal.

- *Ghana: Agricultural Market Access and Rural Development. USAID resources enabled the USDA's work with the Ghanaian Ministry of Food and Agriculture on the recently established Consultative Committee on Agriculture and Rural Development to develop international market access for Ghanaian agricultural products.*

2. DAIRY ENTERPRISE INITIATIVE

The purpose of the Dairy Enterprise Initiative (DEI) is to strengthen the dairy industry in developing and transition countries, and assist U.S. dairy producers and companies in preparing for more competitive international markets. The DEI brings U.S. expertise, technology, and funding together to help small dairy producers, processors and service providers to increase milk yields, produce higher quality and value-added dairy products, educate consumers, and increase cash incomes to small farmers, especially women, who are the primary caretakers of dairy animals.

In FY 2002, obligating \$19.3 million through the DEI and other initiatives, USAID supported dairy-related programs in 30 countries in East Africa, Eastern Europe, Central America, and the Middle East. Dairy Directive funds, granted to American dairy companies and PVOs, supported dairy development in Egypt, Guatemala, Guyana, Honduras, Kenya, Malawi, Nicaragua,

Uganda, West Bank/Gaza, and Zambia. USAID dairy funding has contributed to major successes in dairy development in developing countries and has forged global partnerships for the American dairy industry to promote market economies, create prosperity, and boost trade.

The U.S. dairy industry is helping to build strong dairy industries in developing countries by delivering technical and managerial assistance to commercial dairy processors and dairy producers' associations. This has led to increased trade in U.S. equipment and technology and expanded demand for American technical assistance. Dairy processing enterprises in many countries are now running more efficiently and expanding their markets, helping to stimulate economic growth in rural areas. USAID-funded dairy programs are decreasing the rate of malnutrition and infant/child mortality by increasing the availability of safe, hygienic milk and milk products to children and by training health workers and extension personnel about the role of dairy products and food safety in mother and child nutrition and prenatal care.

The DEI has also encouraged a number of USAID Missions, such as Albania, Montenegro, Bulgaria, Macedonia, and Kenya to fund dairy development programs on an ongoing basis and to become more engaged in dairy sector policy dialogue. This dialogue has led to policy changes that better support smallholder dairy producers, farmers' associations, and private dairy processors.

- *In Honduras, Land O'Lakes, Inc. is working with farmers to improve the quality of the milk they sell to processors so that they can obtain a premium price. This is being achieved through programs to improve animal husbandry practices, establishing refrigerated milk collection*

centers owned by groups of dairy farmers, and marketing activities to promote dairy product consumption. In FY 2002, over 60 dairy farmer associations were organized, and 49 of them received financing for the purchase of tanks and refrigeration equipment. These efforts resulted in the project leveraging a \$5 million investment in the construction of a powdered milk plant. Additionally, the project resulted in Honduran dairy producers importing 60 high-quality dairy animals from the United States for improving local herd genetics.

- *In Guyana, Partners of the Americas is building the capacity of the Guyanese dairy industry to address poverty, food insecurity, and malnutrition in the country. In FY 2002, a milk supplementation program provided 252 students from three schools with a pint of milk a day. The milk is supplied by a local dairy plant which processes milk from local farmers benefiting from project-sponsored training. A comparison of baseline data with data collected after four months of milk feeding to children indicates an improvement in nutritional status, especially among the girls.*
- *In the West Bank/Gaza, Land O'Lakes is assisting low-income dairy producers to increase their incomes and expand the capacity of small and medium-sized enterprises to provide higher-quality dairy products to the Palestinian population. The project educates mothers and children about the health risks posed by unpasteurized milk and provides basic nutrition education. In FY 2002, significant progress was made in training staff and farmers to undertake activities in farmer organization, farm management, cheese processing, and*

extension. The project has implemented an innovative Revolving Ewes Program to increase the number of selected Awassi sheep (a well-adapted Middle Eastern breed), to improve milk quantity and quality, increase meat production, and increase family income.

3. DEVELOPMENT CREDIT AUTHORITY

The Development Credit Authority (DCA) is a relatively new financing mechanism that provides USAID with the authority to issue partial loan guarantees (up to 50 percent) for projects that advance the Agency's development assistance objectives. DCA is based on the premise that private capital in less-developed countries is not being adequately put to work locally to fuel economic growth. DCA loan or bond guarantees, together with technical assistance, can introduce private lenders to creditworthy but underserved sectors. DCA guarantees have mobilized the local currency equivalent of over \$345 million in private financing for sustainable development projects.

Over the past four years since DCA's inception, interest in using DCA as a mechanism to develop credit markets abroad has grown exponentially. DCA guarantees have been particularly effective in stimulating private financing for the agriculture sector. In Mexico, USAID issued a DCA guarantee to Unión Progreso (UP), a regulated and supervised rural credit union established by a small group of farmers in Chihuahua. UP provides financing to micro and small agribusinesses operating in rural communities throughout that region. The DCA guarantee will cover 50 percent of the risk under a loan to UP by a private Mexican commercial bank.

In FY 2002, nine new DCA guarantees were put in place for projects that promote agricultural development. DCA has been used to channel the local currency equivalent of over \$10 million in loan capital to small farmers in Uganda, \$5 million to small and medium-sized enterprises in Nicaragua, and \$6 million to agribusinesses in Ukraine seeking credit for purchasing farm equipment. These DCA projects have mobilized \$41 million in local currency loan financing with a maximum contingent liability of \$19 million.

4. PARTNERSHIPS FOR FOOD INDUSTRY DEVELOPMENT

See: www.pfid.msu.edu/.

Partnerships for Food Industry Development (PFID) is a university/food industry joint technical assistance program that supports field operations that strengthen food industries in USAID host countries and promotes competitive participation in the global trading system. Michigan State University (MSU) is the lead university in a partnership that focuses on the fruit and vegetable sectors to improve quality and safety standards in the context of a global marketplace. Louisiana State University (LSU) is the lead university in a partnership that focuses on the meats and seafood sectors to develop support systems, business networks and high standards of quality for food industry competitiveness. Both MSU and LSU work with an array of public and private sector partners in the United States and developing countries. MSU has pilot projects in Guatemala and Kenya, and LSU has pilot projects in Ukraine and Moldova. In FY 2002, MSU initiated a collaborative project with Royal Ahold, an international grocery store chain, in Ghana through a buy-in with USAID/Ghana.

PFID accomplishments in FY 2002:

- *The MSU-led PFID forged direct market links with the H.E. Butt Grocery Company that resulted in agreements to supply Central Market stores in Texas with high-quality products from Guatemala that meet the U.S. retail market demand for off-season fresh produce.*
- *PFID/MSU completed an analysis of the state of small-scale fruit and vegetable production in the Eastern Cape of South Africa. Markets have been identified for targeted products. This will be followed by a third phase of training to improve quality and quantity of produce, increase access to markets (internally and externally), and increase sales volume at a lower cost.*
- *PFID/LSU developed an association that unites seafood producers and processors in the southern region of Ukraine. The association is working with the government to allot fishing areas and combat poaching. It also facilitates communication between catchers and local authorities, sanitation and environmental control agencies, and custom officers.*

5. RURAL AND AGRICULTURAL INCOMES WITH A SUSTAINABLE ENVIRONMENT INDEFINITE QUANTITY CONTRACT

See: www.raise.org/.

Rural and Agricultural Incomes with a Sustainable Environment (RAISE) Indefinite Quantity Contract is an innovative field support program that draws upon the skills of over 30 partners, including consulting firms, private sector businesses, environmental NGOs, and U.S. universities, to promote environmentally sound

development of agriculture and natural resource-based enterprises. In FY 2002:

- *In Nicaragua, USAID's Proyecto de Mejoramiento de Semillas (PROMESA) is working to promote the viability of a national seed industry. PROMESA facilitated the design and implementation of the National Seed Council, focusing particularly on the formation of an Agricultural Biotechnology and Biosafety Review Commission. The PROMESA team also designed a new seed production program, which will be funded by a World Bank agricultural sector loan.*
- *In Indonesia, the Food Policy Support Activity (FPSA) assists USAID and the Government of Indonesia in developing new pricing and marketing policies for rice. The FPSA team produced three policy briefs on recent rice prices and balancing consumer and producer welfare and published two working papers, both examining the perceived threats and economic realities of food security issues.*
- *In Mozambique, USAID's Agricultural Policy Support activity was involved in developing a new agriculture strategy, which will emphasize agricultural enterprises, rural finance, and agricultural infrastructure to stimulate rural economic growth.*
- *In Kenya, an agricultural sector design activity assessed the Kenyan maize and dairy sectors as input into the design of an implementation program. The program proposes a policy reform agenda for trade, increasing competition, improving marketing systems, and increasing trade services in the maize and dairy sectors as well as*

strengthening farmer associations and organizations.

- *In the Democratic Republic of Congo, USAID's agroforestry assistance activity provided technical assistance and support services to help revitalize small-scale agroforestry production and local agroforestry enterprises.*

6. TRADE CAPACITY BUILDING

In FY 2002, USAID supported agricultural sector trade capacity building in seventy countries. Nearly \$6 million was used to assist countries in meeting sanitary and phyto-sanitary (SPS) international standards and to support agricultural trade more generally through agricultural marketing and export promotion, agricultural research, and technology transfer. SPS measures protect against risks associated with additives, contaminants, and disease-causing organisms in foods, beverages, and feedstuffs, as well as plant and animal pests and diseases. USAID activities supported the establishment of process and production methods, testing, inspection, certification, and approval procedures, statistical methods and sampling procedures, risk assessment methods, and quarantine treatment. These activities will enable countries to better participate in the multilateral trading systems, implement the WTO agreements, and benefit from new trade opportunities.

III. AGRICULTURAL POLICIES AND INSTITUTIONS

USAID supports the development of agricultural and environmental policies, regulations, and institutions that promote good governance and adequate free trade markets and encourage the adoption of technologies that foster environmentally

sound sustainable agriculture. These policy issues cut across the categories of programs highlighted in this annex. The following projects demonstrate USAID's commitment to integrate and strengthen analytical policy and institutional capacity with respect to agriculture, trade, and the environment.

A. Partnerships with U.S. Universities

1. THE FOOD SECURITY II COOPERATIVE AGREEMENT WITH MICHIGAN STATE UNIVERSITY

See: www.aec.msu.edu/agecon/fs2/.

The Food Security (FS) II program carries out a broad array of applied food and agricultural policy research, outreach, and capacity-building activities throughout Africa, in addition to the market-related activities described in the previous section. In FY 2002, FSII policy accomplishments included:

- *FSII research and outreach focused on profitability analysis to identify priority areas for expanded input use and market development, and identification of policies and investments capable of reducing the cost of inputs supplied to farmers (including management training for farmers and traders). Other activities included refinement of lessons learned from innovative efforts to implement such policies and investments, and monitoring of policy reforms and their impacts on input market development.*
- *FSII completed several case studies on Title II monetization in Rwanda and Uganda. In March 2002, FSII produced a synthesis paper addressing key issues of monetization vs. direct distribution of Title II commodities. The paper was*

presented to USAID Food for Peace officials and NGOs.

- *FSII researchers and host-country collaborators working on the Agriculture-Nutrition Linkages Project completed a study on the linkages between agricultural growth and child nutrition. Results from a preliminary analysis of the data were used as background material by USAID/Mali staff in the preparation of its 2003-2012 Country Strategic Plan.*
- *In Zambia, FSII's market analysis and information demonstrated that the private sector has the potential to develop fertilizer markets and is capable of importing large quantities of fertilizer. As a result, the government is no longer importing fertilizer itself, but rather purchases the commodity from the private sector. To diminish the need for input credit, the government has adopted a new transitional strategy whereby the fertilizer is sold at subsidized prices, without a credit element. The subsidy will be phased out over a three year period. The government is encouraging the involvement of the private sector in this transitional program while at the same time reducing by 15 percent the tax on diesel fuel to promote fertilizer use in Zambia.*

B. Other Agency Activities

1. AFRICAN RURAL POLICY ANALYSIS NETWORK

See: arpan.winrock.org/index.cfm.

The primary objective of the African Rural Policy Analysis Network (ARPAN) is to strengthen African researchers' capacity to conduct and publish local social science and policy-related research relevant to

agriculture and rural development in Africa. ARPAN is funded by USAID and USDA and affiliated with Winrock International. The ARPAN network:

helps African scholars to conduct independent, policy-relevant research that contributes to a better understanding of the social, environmental, and economic aspects of Africa's rural and agricultural development from a local perspective;

- *develops working groups of social scientists and stakeholders; and*
- *publishes and disseminates research findings, making them available to policy makers, universities, African governments, and research and development institutions worldwide.*

Accomplishments in FY 2002 included:

- *Development of an informative web site where 15 policy briefs are available;*
- *Awarding of 15 research grants averaging \$3,000 each to study topics such as the impact of HIV/AIDS on agriculture and rural development in West Africa; and*
- *Publishing of 15 monographs on policy studies.*

2. AGRICULTURAL POLICY DEVELOPMENT PROJECT

The Agricultural Policy Development (APD) project addresses policies that encourage increased agricultural employment and efficient agricultural markets. It helps bureaus, missions, and host-country decision makers identify issues and resolve problems involving agricultural

policy distortions. Trade reform, market performance, food equity, agricultural sustainability, and poverty reduction issues are given priority attention. In FY 2002:

- *APD conducted an assessment of the Malian agricultural sector and examined key opportunities for increasing its contribution to economic growth in the country. It provided an analytical basis and recommendations for developing and implementing the country's new strategic plan.*
- *APD addressed policy needs in Rwanda's agricultural sector by:*
- *Examining a strategy to achieve high agricultural growth and the probable impacts of the growth on employment and poverty reduction. This research paper determines the components of a high agricultural growth rate and its impact on employment with an emphasis on the indirect effects on rural nonfarm employment.*
- *Investigating the potential economic impacts of establishing a free trade zone (FTZ) in Rwanda. The study indicated that an economy-wide FTZ for agriculture exports and employment would be advantageous and that political support for an FTZ might be increased by reducing foreign aid inflows to improve (or maintain) price incentives for production in import competing sectors. It also showed that greater fertilizer use would significantly increase production and exports of vegetable crops while considerably increasing rural employment owing to horticulture's high labor intensity.*
- *Preparing specific suggestions for the government of Rwanda in support of a five-year plan for rapid development of*

the potato sector, to lead the intensification and transformation of the agriculture sector. APD facilitated information gathering, analysis and discussion.

3. BROADENING ACCESS AND STRENGTHENING INPUT MARKET SYSTEMS INDEFINITE QUANTITY CONTRACT

In FY 2002, the Broadening Access and Strengthening Input Market Systems (BASIS) Indefinite Quantity Contract (IQC) provided USAID with specialized services to improve the accessibility, efficiency, and integration of markets for such factors as land, water, labor, and financial capital in order to alleviate poverty and contribute to broad-based, environmentally sustainable economic growth. Projects in FY 2002 included:

- *Albania Registration Organizational Improvement Project. Launched in August 2002, this two-year, \$5 million activity finances and provides technical support to ensure the success of the first-time registration of approximately 300 zones (approximately 300,000 titles). To date, the project has organized and funded training for government representatives to familiarize them with the attributes of a land registration operation that is state-of-the-art and self-financing.*
- *West Africa Civil Society Strengthening for Conflict Prevention Project. A team of conflict prevention experts conducted a comprehensive assessment of West African civil society organizations (specifically those in Mali, Cote d'Ivoire, Nigeria, and Ghana) to identify ways that USAID could strengthen their capacity to prevent and/or mitigate*

conflicts. A workshop was held in Bamako, Mali, in January 2002 at which individuals representing key stakeholder groups from civil society organizations in 14 West African countries evaluated the project team's findings. The outcome was a list of possible USAID interventions to increase capacity for conflict prevention in West Africa.

- *East Timor Land Policy and Administration Assessment Team. A joint team of Associates for Rural Development and USAID staff assessed the land policy and administration challenges in East Timor's post-conflict environment. The team recommended possible USAID interventions and actions that the East Timor government should consider in the areas of land policy reform and administration system development.*

IV. RURAL DEVELOPMENT, INCLUDING NATURAL RESOURCE MANAGEMENT

Rural development integrates agricultural programs within the larger context of multisectoral development in rural areas. Included in this broader context is the community-based management of natural resources. In addition to building capacity for governance, the development of community-based management of natural resources is crucial if poverty in rural populations is to be reduced and if agriculture is going to meet the food needs of the growing human population. Agricultural demands on water, soil, biodiversity, and land are ever increasing. In many regions they have already degraded

the natural resource base upon which agriculture depends. These negative impacts must be mitigated and more sustainable management methods found. USAID is playing an important role in addressing these requirements in developing countries through the programs of its bureaus and missions.

A summary of USAID involvement in agricultural resources management is presented in "Integrating Natural Resource Management and Agriculture," a section in this Title XII report. The paper includes many examples of mission-funded projects. Presented here are highlights of FY 2002 accomplishments of the main activities funded through the EGAT Bureau that address this topic.

A. Partnerships with U.S. Universities

1. COLLABORATIVE RESEARCH SUPPORT PROGRAMS

Sustainable Agriculture, Natural Resources and Environmental Management Collaborative Research Support Program

See: www.sanrem.uga.edu.

The mission of the Sustainable Agriculture, Natural Resources and Environmental Management (SANREM) CRSP is to assist in the creation and successful application of decision support methods, information, institutional innovations, and local capacity to support participatory sustainable agriculture and natural resource planning, management and policy analysis at local, municipal, provincial, and national levels. In FY 2002:

- *To control erosion on slopes, Natural Vegetative Strips were adopted by over*

800 households in the Lantapan municipality of the Philippines. This method of leaving narrow strips of natural vegetation along the contour was developed by the World Agroforestry Center (formerly the International Center for Research in Agroforestry) and found to effectively control soil erosion by relying on natural vegetation rather than on externally sourced planting materials and requiring fewer person-days of work than conventional contour hedgerow methods.

- Improved pastureland management and natural-resource conflict resolution between farmer and herder communities in Mali was promoted through projects of Virginia Polytechnic Institute and State University in concert with CARE and the Institut d'Economie Rurale (IER) of Mali. SANREM facilitated the organization of a group of local representatives of the two producer groups and enhanced its capacity through training in holistic management, conflict mediation, NRM legislation, financial planning, literacy, and numeracy. Today, farmers and herders are working together to implement an open-range pastureland management plan in their territories. An elected body to advise local government on NRM issues has been created, and a conflict management manual has been produced in the local language to assist community-based environmental monitors in negotiating disputes over pastoral resources.
- Crop and medicinal plant biodiversity conservation was initiated in communities in Imbabura Province, Ecuador. Genetic resources and associated cultural practices are being preserved through methods developed by

SANREM researchers for recovering and maintaining traditional food crops and medicinal plants. The initiative has provided local youth with incentives to learn and value their elders' indigenous knowledge and opportunities to acquire data collection and seed preservation skills. It also stimulated an ecotourism initiative and biodiversity fairs, which promote community commitment to natural resource conservation and showcase women's knowledge of food crops and traditional medicine. Educational materials in local languages and Spanish were developed and distributed to local schools, administrators, and NGOs. International research centers (the International Plant Genetic Resources Institute, and the International Potato Center) and U.S. regional seed-saving organizations (Native Seed Search and Southern Seed Legacy) have adopted the methodology and used it for saving endangered landraces and wild species among southwestern Native American groups.

Soil Management Collaborative Research Support Program

See: tpss.hawaii.edu/sm-crsp/.

The Soil Management CRSP's goal is to enable food-insecure countries of Africa, Asia, and Latin America to combat poverty and hunger without further compromising the sustainability of their land resource base, particularly the soil. To achieve this goal, the CRSP focuses on enabling developing-country institutions to adopt and apply information to increase agricultural productivity, scale up technology adoption, and strengthen human and institutional capacity to combat poverty, food insecurity, and environmental degradation. Knowledge-based tools developed by the CRSP program enable its customers to (1) diagnose

problems that constrain agricultural performance, (2) prescribe alternative solutions from which the customer can choose to solve the problem, and (3) compare the economic benefits of the available options.

- *In FY 2002, the Soil Management CRSP implemented a joint NASA/CRSP project in West Africa to validate the carbon accounting system involving both the Soil Management and SANREM CRSPs. Participating institutions are IER in Mali, the Universities of Florida and Hawaii, and USDA/ARS in Beltsville, MD, and in Griffin, GA.*

Global Livestock Collaborative Research Support Program

See: glcrsp.ucdavis.edu/index.html.

In addition to its accomplishments in the area of productivity and markets, the GL CRSP also addressed natural resource management issues during FY 2002:

- *The GL CRSP Livestock Early Warning System (LEWS) became fully functional and was implemented in Ethiopia, Kenya, Tanzania, and Uganda, with situation reports distributed every 10 days. Early warning information on rangeland conditions is being provided to over 300 government organizations, NGOs, and pastoral associations. Predicting spatial forage availability will provide East African pastoralists with more flexibility in decision making, leading to timely destocking strategies and greater ecosystem integrity. A monthly newsletter about pastoral conditions goes to over 400 decision makers and organizations in the region.*
- *In Central Asia, the Livestock Development and Rangeland*

Conservation Tools Project has developed the capacity to conduct regional estimates of carbon flux to establish a basis for making improved land use decisions regarding carbon sequestration. The project formed the basis for a World Bank Global Environment Facility (GEF) grant to Kazakhstan for rangeland rehabilitation.

West Africa Natural Resource Management InterCRSP

See: filebox.vt.edu/admin/international/resdev/InterCRSP.html.

The West Africa Natural Resource Management (NRM) InterCRSP addresses regional constraints to the application of natural resource management through an integrated program of collaborative adaptive research and technology transfer activities involving CRSP scientists from the United States and researchers from Cape Verde, Senegal, Burkina Faso, Cameroon, Chad, The Gambia, Ghana, Mali, and Niger. In FY 2002 InterCRSP principal investigators from the United States and across the region met in Lomé, Togo, to review progress, plan for the final year of the project, and prepare a proposal for a Phase II of the project.

2. COASTAL RESOURCES MANAGEMENT II

See: www.crc.uri.edu/crcandaaid.html.

The Coastal Resources Management II Project (CRM II), a partnership between the University of Rhode Island Coastal Resource Center and USAID, promotes increased conservation and sustainable use of coastal resources by simultaneously focusing on:

- *field support to key countries where there is interest in and need for integrated coastal management (ICM), and*
- *global technical leadership through substantive participation in global initiatives, the development of strategic partnerships, and the development and dissemination of ICM concepts and tools through global capacity building efforts.*

In FY 2002 CRM II continued to produce results at both the global and country level. The following are examples from sectors where significant accomplishments were made this fiscal year:

- *National policy initiatives—In Indonesia, CRM II helped the Ministry of Marine Affairs and Fisheries to carry out a nation-wide consultative process to draft its first national coastal management law.*
- *Promoting sustainable economic use—In Tanzania, a public/private inter-sectoral group has prepared guidelines for the coastal tourism sector as well as the local component of a tourism development plan for Kilwa, a UN Biosphere Reserve site.*
- *Capacity-building—CRM II published and distributed “A World of Learning in Coastal Management: a Portfolio of Coastal Resources Management Program Experience and Products.”*
- *ICM leadership, capacity development, and networks—CRM II played a major role in shaping the Oceans and Coasts Agenda that emerged from the World Summit on Sustainable Development (WSSD) in Johannesburg by assessing progress and defining the path forward for improved ICM governance and*

capacity. CRM II was also successful in getting equity issues on the oceans and coasts agenda, and has launched gender equity discussions at several fora worldwide.

B. Partnerships with International Agricultural Research Centers

International Agricultural Research Centers participating in the CGIAR had many accomplishments related to natural resource management and rural development in FY 2002. Highlighted here are just two:

- *Using small-scale, locally produced mechanization, farmers are moving toward low-till agriculture, doing away with traditional plowing to prepare the land. Efficiency of irrigation increases dramatically due to increased water penetration and by decreasing the wasteful flooding of fields. Water savings range from 30 to 50 percent, potentially saving 5 billion cubic meters of water per year across the South Asia region. Earlier harvesting of wheat means that farmers can add an additional crop to their annual cycle. Farmers can now plant profitable and nutritious legumes after wheat and before rice, improving soil fertility and making these foods more available and affordable. Crop diversification results in an economically more robust rural economy, as well as more environmentally sound management of one of the world’s most vital agro-ecosystems. These methods are being promoted through programs of three CGIAR centers: the International Maize and Wheat Improvement Center (CIMMYT), the International Rice Research Institute (IRRI), and the International Water Management Institute (IWMI).*

- *Through work of the IRRI, water is being better managed in the Mekong Delta to accommodate both rice intensification and shrimp raising. A model developed by IRRI researchers was used to explore the sustainability of various scenarios of water management and agricultural production. The project's outputs led to revised land-use zoning and management of brackish and freshwater resources for the benefit of both rice and shrimp farmers.*

approaches for more effective future projects.

C. Other Agency Activities

1. INTEGRATED WATER AND COASTAL RESOURCES MANAGEMENT INDEFINITE QUANTITY CONTRACT

See: www.ard-water.com/

The Integrated Water and Coastal Resources Management Indefinite Quantity Contract provides a vehicle for supplying technical expertise in the design and implementation of strategies and programs in integrated water and coastal resources management through three consortia of engineering and consulting firms, NGOs, other international organizations, and U.S. universities. Projects ongoing in FY 2002 included:

- *Recommendations and technical oversight for the rehabilitation of agricultural irrigation systems in Afghanistan,*
- *Technical support for the implementation of the Souss-Massa Integrated River Basin Management Project in Morocco, and*
- *Assessment of USAID watershed management projects in Central America and recommendations for*

ANNEX SIX

EDUCATION, TRAINING, AND OUTREACH

Capacity building is a central theme of USAID agricultural development programs. USAID builds knowledge through degree and nondegree programs, workshops, farmer field schools, and distance learning. In FY 2002, over 40,000 individuals benefited from USAID-sponsored capacity-building activities (Table 1). Participants in these programs included children and young people, smallholder to large-scale agriculturalists, extension agents, local and national government representatives, agricultural scientists, and NGO staff. These programs bridge the knowledge divide in both directions. Local knowledge is crucial to developing agricultural programs that build upon the experience of farmers and address their real needs. Technologies and methodologies developed at research institutions have the potential to improve yields, open new markets, and increase the sustainability of natural resources used in agriculture.

The CRSPs play a central role in degree training, supporting 75 percent of the individuals completing or working toward a degree (bachelor's, master's, or Ph.D.) in FY 2002. Non-degree capacity building in FY 2002 included professional training (short programs intended for professionals), workshops and in-field training in which participants gain hands-on experience, and conferences and seminars (Table 1). Providing voluntary technical assistance on a people-to-people basis, the John Ogonowski Farmer-to-Farmer (FTF)

program trained over 40 percent of the individuals benefiting from short-term training through workshops and in-field programs.

TRAINING

USAID supports the education of agricultural scientists, technicians, and policy makers from developing countries through programs at U.S. and host-country institutions. Undergraduate training most often occurs at host-country institutions, while USAID-supported graduate degree programs usually involve some course work or research at a U.S. university. Non-degree training through post-doctoral studies, sabbatical visits, and workshops strengthen the capacity of research institutions in developing countries.

Collaborative Research Support Programs

The CRSPs continue to play an important role in human capacity building. With CRSP support, 178 individuals completed degree training in FY 2002, while 127 spent the year working toward a degree. These students received training at U.S. universities or at host-country institutions. Their studies were in a wide range of fields, including agronomy, genetics, plant breeding, biochemistry, pathology, entomology, weed science, statistics, rural development, economics, food science, and environmental management.

The Center for Human Capacity Development

The Center for Human Capacity Development became part of the EGAT Bureau's Office of Education in FY 2002. It continues to support higher education and training programs in developing countries with competitive grants administered through the Association Liaison Office for International Development (ALO) and the United Negro College Fund Special Programs (UNCFSP).

See: www.aascu.org/alof/ and

www.uncfsp.org.

ALO administers a cooperative agreement with six major U.S. higher education associations. The agreement supports and assists these associations in fostering cooperative development partnerships with colleges and universities abroad. In FY 2002, with funds from USAID, ALO supported 12 partnerships with an agricultural component, 12 partnerships focusing on natural resource management, and four dealing with environmental policy. These include:

- *The University of California-Davis (UC-Davis) and the Universidad Nacional Agraria (UNA) are partnering to enhance post-harvest agriculture programs at educational institutions in Nicaragua. Six students have completed training programs in post-harvest biology and technology at UC-Davis. Another significant accomplishment was the formation of a post-harvest team at UNA, composed primarily of national experts who will lead efforts to improve post-harvest technology in Nicaragua, develop a web site, arrange for faculty exchanges, and seek additional funding.*
- *Virginia State University and the University of Asmara in Eritrea are working together to domesticate the indigenous vernonia plant (**Vernonia galamensis**) as a viable industrial oil crop in Eritrea. The plant is drought resistant, and its seeds contain an environmentally friendly oil that is widely used in industrial applications. Research is underway to identify agronomic practices that give optimum seed yields and also to identify seed cleaning and processing systems.*
- *The Fort Valley State University (Georgia) and the Awassa College of Agriculture (ACA) in Ethiopia began a partnership to improve Ethiopian household food security and enhance teaching, research, and extension at ACA. An ACA faculty member completed four months of training in parasitology at Langston University (Oklahoma) and Fort Valley State University, ACA received supplies for training and research, and a workshop on small ruminants was held.*
- *The Mississippi Valley State University and Western University for Azerbaijan are creating an environmental*

UNCFSP provides support for institutions of higher learning, with an emphasis on historically black colleges and universities and other minority institutions, to build relationships and create partnerships with governments and other organizations. UNCFSP provides resources and supports capacity building in Africa through its International Development Partnerships (IDP), its Tertiary Education Linkages Project (TELP) and its Education for Development and Democracy Initiative (EDDI). In FY 2002, three IDP and one EDDI partnership had agricultural or environmental components. These include:

management curriculum with a focus on information technology at Western University. The three-year bilateral program focuses on developing a

curriculum in Environmental Management that will help develop human potential and foster good natural resource management.

TABLE 9 CAPACITY-BUILDING ACTIVITIES: NUMBER OF BENEFICIARIES FY 1999-FY 2002²¹

| | FY 1999 | FY 2000 | FY 2001 | FY 2002 |
|-------------------------------------|----------------|----------------|----------------|----------------|
| Degree training completed | 120 | 80 | 88 | 183 |
| Degree training in progress | na | na | 218 | 225 |
| Non-degree capacity building | | | | |
| Professional training | na | na | na | 5,290 |
| Workshops and in-field training | na | na | na | 33,267 |
| Conferences | na | na | na | 1,996 |
| Non-degree total | 1,226 | 1,910 | 4,787 | 40,553 |
| Total | 1,346 | 1,990 | 5,093 | 40,961 |

INFORMATION DISSEMINATION

Information relevant to agricultural development is disseminated and adapted locally through workshops and publications, and in local communities through farmer field schools and other field-based training programs. Participants include farmers, extension agents, policy-makers, development practitioners, and researchers.

In-Field Training

THE JOHN OGWONSKI FARMER-TO-FARMER (FTF) PROGRAM: The FTF Program provides voluntary technical assistance on a people-to-people basis to farmers, farm groups, agricultural education institutions, and agribusinesses. In FY 2002, FTF provided training to over 14,000 participants. Nearly 800 FTF volunteer assignments in the field assisted 613 host-country organizations in areas such as rural development, agribusiness, marketing, bee keeping, business development, and cooperative association. Major FTF activities took place in Nigeria, Nepal,

²¹ Not all categories of information were collected for each fiscal year. USAID began collecting data on degree training in progress in FY 2001; collection of more detailed information on non-degree program participants was begun in FY 2002. No data from the Farmer-to-Farmer Program prior to FY 2002 are included

Azerbaijan, Armenia, and Georgia. In general, participants benefit from FTF programs either as direct trainees or via improved technologies promoted through the FTF program.

DAIRY ENTERPRISE INITIATIVE: Through this initiative, ACDI-VOCA is training a core group of Egyptian health educators on how to teach women farmers about the role of dairy products and food safety in improving child nutrition as well as hygienic milking procedures and other dairy husbandry practices. Egyptian women have traditionally played a major role in dairy production. Over 12,000 households have received dairy information and 66 percent have adopted project recommendations, a response that indicates widespread interest. Training and public awareness campaigns about the nutritive value of milk have led to a 47 percent increase in milk consumption and a 70 percent increase in sales of pasteurized milk.

INTEGRATED PEST MANAGEMENT CRSP: IPM CRSP technologies have reached 1500 farmers in Bangladesh through technology diffusion trials in farmers' fields and demonstration plots. At a recent field day, 2,000 farmers, extension personnel, and Bangladeshi government officials learned about these technologies. In Ecuador, Farmers Field Schools trained more than 300 potato farmers in IPM methods. In the Philippines and Jamaica, over 1,000 farmers were trained in IPM CRSP technologies for various vegetable crops.

Workshops and Conferences

SOFTWARE TRAINING: The Soil Management (SM) CRSP organized three workshops to train soil technicians in the use of SM CRSP software (NuMaSS), which facilitates integrated nutrient management. Twenty-six participants attended the Africa

workshop, held in Togo and organized in association with the International Fertilizer Development Center (IFDC). Nineteen participated in the Asia workshop held in association with the International Rice Research Institute (IRRI) in the Philippines, and nineteen participants from Latin America attended the training program in Costa Rica.

PESTS AND DISEASES OF SORGHUM AND PEARL MILLET: The INTSORMIL CRSP sponsored a workshop in Managua, Nicaragua, to teach participants about state-of-the-art research on the diseases and pests of sorghum and pearl millet in Central America.

BEAN PATHOGENS: The Bean/Cowpea CRSP sponsored the third Bean Rust and second Common Bacterial Blight workshops in South Africa. These workshops brought new technologies to East and Southern African bean scientists and facilitated communication between plant breeders in Latin America and Africa and pathologists and scientists from the International Center for Tropical Agriculture (CIAT).

THE COASTAL RESOURCE MANAGEMENT (CRM) program hosted a series of training seminars in coastal resource management and environmental/gender program implementation for 274 participants worldwide at the Summer Institute of Coastal Management. The International Coastal Management Learning workshop, sponsored by the CRM in Indonesia, was attended by 1,300 participants.

LINKING HUMAN NUTRITION AND AGRICULTURE: A conference on "Animal Source Foods and Nutrition in Developing Countries," sponsored by GLCRSP and co-sponsored by the UN Food and Agriculture Organization (FAO), Land O'Lakes, Heifer Project International, and the Pond

Dynamics/Aquaculture CRSP, brought together researchers, research priorities for linking human nutrition and agriculture.

SUPPORT FOR FISH FARMING: In Central America, PD/A CRSP researchers from Auburn University and the University of Georgia trained NGO extension agents in the use of the Web-based Information Delivery System for Tilapia (WIDeST), which provides information and assistance with decisionmaking processes for small and medium-scale fish farmers.

TECHNICAL ASSISTANCE WITH FOOD AID ISSUES: In September 2002, USAID hosted a group of scientists and policy makers from Zambia on a study tour of the United States to visit regulatory agencies and key stakeholder groups, including prominent NGOs, to learn about the safety of U.S.-based bioengineered foods.

AGRIBUSINESS SUPPORT IN ARMENIA: Local business service providers participated in seminars on product branding strategies, with support from the Rural and Agricultural Incomes with a Sustainable Environment (RAISE) Indefinite Quantity Contract (IQC). The activity also enabled Armenian businesses to attend trade shows in Italy and Belgium, providing them with vital contacts in their industries.

THE PARTNERSHIPS FOR FOOD INDUSTRY DEVELOPMENT (PFID) supported capacity building in the food industry through the following courses:

- *International Food Safety Short Course: This PFID/Michigan State University (MSU) project provided training to Latin American officials. The intensive training was followed by a week in Washington where the participants met with U.S. food safety regulatory officials at USDA, FDA, and EPA. Both in*

Michigan and in Washington, participants made field trips to production, processing, and retail facilities to learn methods for ensuring the safety of fruit and vegetable products.

- *Hazard Analysis Critical Control Points (HACCP) standard certification training program for meat and poultry in Ukraine and Moldova: This PFID/Louisiana State University (LSU) project provided officials with information to assist their governments in drafting regulations, curricula, and methodological materials. HACCP is currently recognized as the most effective method to insure safe food production in a processing plant.*
- *Economic seminars in Moldova: The seminars, organized by PFID/LSU, highlighted U.S. livestock and meat supply standards, current trends in U.S. and global consumption, branded food marketing, the futures market, and implications for the Ukraine and Moldova meat industry.*

LAND POLICY AND ADMINISTRATION CONSULTATION: BASIS IQC and the World Bank co-sponsored this multi-donor consultative process. Four regional workshops and two electronic conferences, with participation by government officials, civil society, researchers, and development practitioners from around the world, provided useful venues for donor coordination, as well as significant input into the World Bank's Policy Research Report on pro-poor land policy programming. These events also provided capacity building and networking opportunities for USAID mission staff and their collaborators.

WORLD IRRIGATION INFORMATION NETWORK (IRRINET): Housed at the International Irrigation Center at Utah State University, IrriNet aims to assemble, develop, and disseminate information needed by agricultural water institutions and personnel involved in irrigation-related research, training, and technical assistance. In FY 2002, a conference was held at Utah State University to determine what types of training and technical assistance IrriNet should provide and what applied research opportunities it should support. The conference brought together alumni and partners from irrigation projects carried out by Utah State in Central America, South America, Asia, Africa, and Europe. A pilot version of the interface has been developed which uses comprehensive teaching software to provide information on irrigation technology.

Publications

BIOSAFETY AND RISK ASSESSMENT IN AGRICULTURAL BIOTECHNOLOGY: This technical workbook was published by researchers at Michigan State University, funded through ABSP I, the predecessor to the Collaborative Agricultural Biotechnology Initiative (CABIO). The workbook is designed to complement technical training in biosafety for developing country scientists, including members of national biosafety committees, biotechnology regulatory officials, and scientists working in the public and private sectors.

See:
www.iaa.msu.edu/absp/workbook/bio1.pdf.

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A SOIL CARBON ACCOUNTING AND MANAGEMENT SYSTEM FOR EMISSIONS TRADING: This monograph, published by the

Soil Management CRSP, provides guidelines that enable customers to sequester carbon in soils for emissions trading. Authors represented the University of Florida, University of Hawaii, Institut d'Economie Rurale (IER) in Mali, Montana State University, and USDA/ARS in Beltsville, MD.

See: tpss.hawaii.edu/sm-crsp/pubs/index.html.

The accounting system enables host-country institutions and farming communities to assess baseline carbon in large tracts of spatially variable farmland, and it enables customers to estimate carbon accretion over time for alternative land management practices.

NUTRIENT MANAGEMENT DECISION SUPPORT SYSTEM (NUMASS) software was developed by Soil Management CRSP researchers at Cornell University, the University of Hawaii, North Carolina State University, and Texas A&M University. Loaded on a hand-held computer and used with a lowcost, portable soil test kit, this software will enable users to diagnose nutrient deficiencies and select among various options for improving soil quality. The NuMaSS software will provide the user with estimates of potential crop yields for different management options (e.g., fertilizer type, timing of application). A small business firm (Boon Dai Thai) in Bangkok, Thailand, has obtained a license to manufacture the soil test kit for global marketing. The kit has just been introduced in Mali by IER and in Senegal by the Senegalese Institute of Agricultural Research (ISRA) for evaluation by local institutions and agribusiness.

ANNEX SEVEN

FIELD SUPPORT

The EGAT Bureau provides technical assistance to USAID country and regional missions. Drawing upon its staff's extensive field experience in agricultural productivity, agribusiness and markets, agricultural and rural policy, and natural resource management, the Bureau assists missions in identifying, designing, implementing, and evaluating their programs and strategic objectives. Following USAID's reorganization, field support to country and regional missions has become a new central objective for EGAT staff. Support in FY 2002 included:

Agribusiness, Competitiveness, and Trade: EGAT staff assisted USAID missions in Azerbaijan, Egypt, Croatia, Bosnia, and Uganda with program development.

Agriculture and rural development: The Nepal mission was assisted in developing a strategy to revitalize rural development.

Biotechnology: Country missions in India, Bangladesh, Nigeria, and South Africa and regional missions for East and Southern Africa received technical support in the development of biotechnology programs.

Land policy: The missions of East Timor and Rwanda received technical support focusing on land policy reform and administration.

Natural Resources Management and Agriculture: The Uganda mission was assisted in developing new projects.

ANNEX EIGHT

ACRONYMS

| | |
|-----------|---|
| ABSP II | Agricultural Biotechnology for Sustainable Productivity Project II |
| ACA | Awassa College of Agriculture |
| ACDI-VOCA | Agriculture Cooperative Development International/Volunteers in Overseas Cooperative Assistance |
| AFR | Sub-Saharan Africa Bureau |
| AFSI | Africa Food Security Initiative |
| AG | Office of Agriculture |
| AGOA | African Growth and Opportunity Act |
| ALO | Association Liaison Office for International Development |
| ANE | Asia and the Near East Bureau |
| APD | Agricultural Policy Development |
| APHIS | Animal and Plant Health Inspection Service |
| ARPAN | African Rural Policy Analysis Network |
| ARS | Agriculture Research Service, USDA |
| ASARECA | Association for Strengthening Agricultural Research in Eastern and Central Africa |
| ASNAPP | Agribusiness and Sustainable Natural African Plant Products |
| ATRIP | Africa Trade and Investment Policy |
| BASIS | Broadening Access and Strengthening Input Marketing Systems CRSP |
| BIFAD | Board for International Food and Agricultural Development |
| BOLFOR | Bolivia Sustainable Forestry Program |
| CABIO | Collaborative Agricultural Biotechnology Initiative |
| CAFTA | Central American Free Trade Agreement |
| CBNRM | Community-based natural resource management |
| CDP | Cooperative Development Program |
| CEE | Central and Eastern Europe |
| CGIAR | Consultative Group on International Agricultural Research |
| CIAT | International Center for Tropical Agriculture |
| CIFOR | Center for International Forestry Research |

| | |
|--------|--|
| CIMMYT | International Maize and Wheat Improvement Center |
| CIP | International Potato Center |
| CLUSA | Cooperative League of the USA |
| COMESA | Common Market of East and Southern Africa |
| CRM II | Coastal Resources Management II Project |
| CRSP | Collaborative Research Support Program |
| DA | Development Assistance |
| DCA | Development Credit Authority |
| DCF | District Cooperative Federation |
| DCHA | Bureau of Democracy, Conflict, and Humanitarian Assistance |
| DEI | Dairy Enterprise Initiative |
| E&E | Europe and Eurasia |
| EGAT | Bureau of Economic Growth, Agriculture, and Trade |
| EQL | Environmental Quality Laboratory |
| ESF | Economic Support Fund |
| EU | European Union |
| FAO | Food and Agriculture Organization of the United Nations |
| FARA | Forum for Agricultural Research in Africa |
| FPSA | Food Policy Support Activity |
| FRB | Foods Resource Bank |
| FS II | Food Security II |
| FSA | Farming Systems Approach |
| FSU | Former Soviet Union |
| FTAA | Free Trade Area of the Americas |
| FTF | Farmer-to-Farmer |
| FTZ | Free trade zone |
| FY | Fiscal Year |
| G | Global Bureau |
| GDA | Global Development Alliance |
| GH | Global Health Bureau |
| GIS | Geographical Information System |

| | |
|-----------|--|
| GISD | Geographic Information for Sustainable Development |
| GL | Global Livestock CRSP |
| HACCP | Hazard Analysis of Critical Control Points |
| HCD | Center for Human Capacity Development |
| IARC | International Agricultural Research Center |
| ICARDA | International Center for Agricultural Research in the Dry Areas |
| ICIPE | International Center for Insect Physiology and Ecology |
| ICRAF | International Center for Research on Agroforestry |
| ICLARM | International Center for Living Aquatic Resources Management |
| ICM | Integrated coastal management |
| ICRISAT | International Crops Research Institute for the Semi-Arid Tropics |
| IEHA | Initiative to End Hunger in Africa |
| IER | Institute of the Rural Economy |
| IFDC | International Fertilizer Development Center |
| IFPRI | International Food Policy Research Institute |
| IIC | International Irrigation Center |
| IITA | International Institute for Tropical Agriculture |
| ILRI | International Livestock Research Institute |
| INTSORMIL | Sorghum/Millet CRSP |
| IPGRI | International Plant Genetic Resources Institute |
| IPM | Integrated Pest Management |
| IRRI | International Rice Research Institute |
| IQC | Indefinite Quantity Contract |
| ISRA | Senegalese Institute of Agricultural Research |
| IWMI | International Water Management Institute |
| LAC | Latin America and the Caribbean |
| LCC | Leaf color chart |
| LEWS | Livestock Early Warning System |
| LSU | Louisiana State University |
| MAPA | Market Access and Poverty Alleviation |
| MCA | Millennium Challenge Account |

| | |
|-----------|--|
| MG | Matching Grant |
| MSU | Michigan State University |
| MU | Makerere University |
| NAFTA | North American Free Trade Agreement |
| NARO | National Agricultural Research Organization |
| NARS | National Agricultural Research Systems |
| NASA | National Aeronautics and Space Administration |
| NASULGC | National Association of State Universities and Land Grant Colleges |
| NIMA | National Imagery and Mapping Agency |
| NRC | National Research Council |
| NRM | Natural resource management |
| NEPAD | New Partnership for African Development |
| NGO | Non-governmental organization |
| NOAA | National Oceanic and Atmospheric Administration |
| NuMaSS | Nutrient Management Support System |
| OFDA | Office of Foreign Disaster Assistance |
| PADISMA | Decentralized Agricultural Market Information System Project |
| PD/A | Pond Dynamics/Aquaculture CRSP |
| PFID | Partnership for Food Industry Development |
| PPC | Policy and Program Coordination Bureau |
| PROMESA | Proyecto de Mejoramiento de Semillas (Seed Improvement Project) |
| PVC | Office of Private and Voluntary Cooperation |
| PVO | Private Voluntary Organization |
| RAISE | Rural and Agricultural Incomes with a Sustainable Environment |
| REDSO/ESA | Regional Economic Development Services Office for East and Southern Africa |
| SAKSS | Strategic Analysis and Knowledge Support System |
| SANREM | Sustainable Agriculture and Natural Resource Management CRSP |
| SM | Soil Management CRSP |
| SPARE | Strategic Partnership for Agricultural Research and Education |
| SPS | Sanitary Phyto-Sanitary |
| SRO | Sub-regional Research Organization |

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|--------|--|
| TMI | The Mountain Institute |
| TRADE | Trade for African Development and Enterprise |
| UNCED | United Nations Conference on the Environment and Development |
| UP | Unión Progreso |
| USAID | U.S. Agency for International Development |
| USDA | U.S. Department of Agriculture |
| USGS | U.S. Geological Survey |
| VSU | Virginia State University |
| WFP | World Food Program |
| WHO | World Health Organization |
| WID | Women in Development |
| WIDeST | Web-based Information Delivery System for Tilapia |
| WSSD | World Summit on Sustainable Development |
| WTO | World Trade Organization |

CREDITS AND ENDNOTES

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Leslie Hunter edited the 2002 Title XII Report with assistance from Holly Zimmerman, and Anne Green did the design and layout.

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