

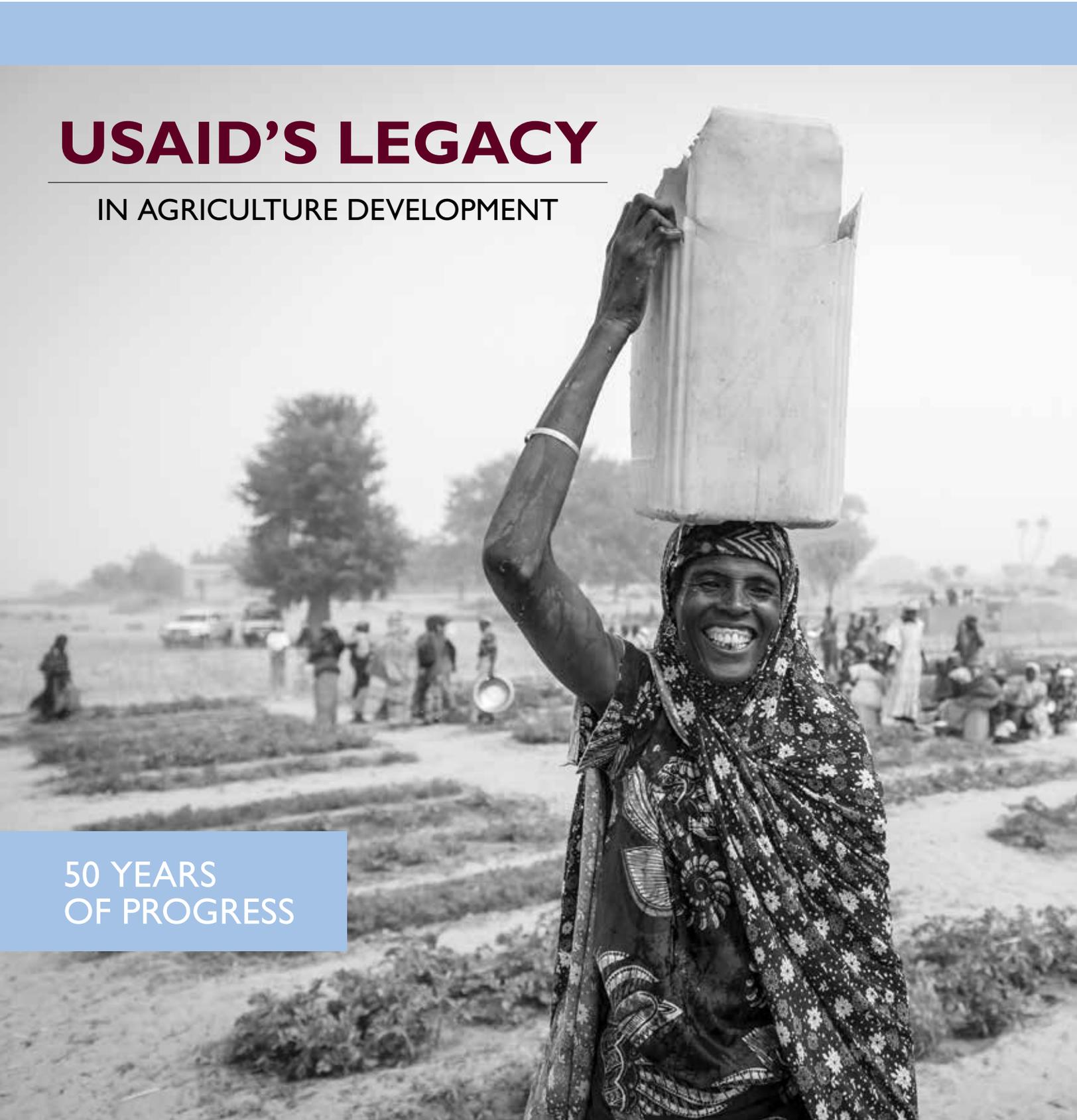


USAID
FROM THE AMERICAN PEOPLE

USAID'S LEGACY

IN AGRICULTURE DEVELOPMENT

50 YEARS
OF PROGRESS



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U.S. Agency for International Development
Bureau for Food Security
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FRONT COVER: A USAID-funded five-year development food security activity to tackle malnutrition and food insecurity in Niger helped these women start a community garden in their village. They use the garden to feed their families and also sell vegetables for some additional income. This is the first garden they have ever managed, and aimed to extend it with a new drip irrigation system. MERCY CORPS



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AT LEFT: Researchers from The Ohio State University work with colleagues at Punjab Agricultural University (PAU), India’s oldest agricultural university. PAU played a key role in increasing food grain production and ushering in the Green Revolution in India.



FOREWORD

Today, more than 840 million people in the world go to bed hungry, and poor nutrition contributes to nearly half of all deaths in children under the age of five each year. Since 2009, President Obama's global food security initiative, Feed the Future, has helped turn the tide against this devastating reality, translating a global vision of food security into sustainable impact that is lifting millions of people from poverty and giving them a foothold in the global economy.

For generations, this aspiration—of a world without hunger—has guided American engagement in development. Throughout our 50-year history, USAID has pushed the frontiers of innovation to develop, test, and advance best practices in agricultural and rural development. In fact, around the same time that President Kennedy was reshaping our nation's food aid program into a global humanitarian mission, the American scientist Norman Borlaug was developing new strains of wheat and rice that ushered in the Green Revolution. Working with researchers around the world, Dr. Borlaug developed high-yielding seed varieties that helped save untold numbers of people from starvation and transformed farms from the United States to India.

Our Agency was instrumental in launching the Green Revolution, a term coined in 1968 by former USAID Administrator William Gaud. Over the same period that Dr. Borlaug was pioneering new research and technology in agriculture, USAID set up and nurtured a new model of long-term collaborative agricultural research and institution-building relationships among dozens of American and overseas universities. In the process, we built a cadre of local leaders in agricultural development who became change-agents in their own communities.

Today, we once again face the need for the kind of large-scale results that Dr. Borlaug achieved. The global community will need to increase agricultural productivity by at least 60 percent in order to feed a projected population of more than 9 billion people by 2050. That's why the United States, along with a vast network of partners, is building on the legacy of the Green Revolution to scale our impact with a new emphasis on science and business that is quietly and powerfully changing the face of poverty, hunger, and malnutrition around the world. Feed the Future represents a fundamentally different approach to development that places smallholder farmers, especially women, at the center of country-led efforts to transform agriculture.

In 2012, working on the ground in nineteen countries, Feed the Future helped 7 million farmers adopt improved technologies or management practices, growing yields and livelihoods. In Bangladesh, farmers are using a new fertilizer technique that led to the first-ever rice surplus in the nation's poorest region. In Haiti, improved planting techniques helped increase corn yields by 340 percent and beans by 100 percent. Far from fleeting, these efforts are paying off in the form of higher incomes and brighter economies.

It is easy to be skeptical about efforts to solve enduring challenges—like hunger and poverty—that are as old as humankind. But over the last several years, we have seen the power of high-impact partnerships break intractable barriers that continue to stand in the way of progress. To help spur the private sector investment in agriculture, President Obama announced the New Alliance for Food Security and Nutrition, a groundbreaking model of partnership that matches commitments from African governments to reform with commitments from companies to invest.

In one year, the New Alliance has grown into a \$3.7 billion public-private partnership that has encouraged reforms from nine African governments and commitments from more than 70 companies, half of them local.

Looking back over the past half-century, it is clear USAID's investments in people and productivity, as well as our support of scientific and policy research, have contributed immensely to the global transformation of agriculture—and to sustainably reducing hunger and rural poverty for millions of people.

For many, however, this history is largely unknown. This book, USAID's Legacy in Agricultural Development, is intended to tell this story and remind us of the progress we have achieved and the lessons we have learned. We are proud of our nation's historic leadership in advancing agricultural research and strengthening food security, and we believe it provides a strong foundation for our efforts today to end extreme poverty and its most devastating consequences, including chronic hunger and widespread malnutrition.

In the fight to end global poverty and hunger, we must embrace all the tools at our disposal, especially innovation, partnership, and a willingness to learn and adapt. Today, we have the opportunity to achieve progress simply unimaginable in the past. As we rise to this challenge, we must also reflect on our past and learn from our own history to help transform our future.

Sincerely,

A handwritten signature in black ink, appearing to read "Rajiv Shah".

Rajiv Shah
Administrator
United States Agency for International Development

ACKNOWLEDGEMENTS

USAID would like to thank the contributing expert authors, Dale Adams, Ralph W. Cummings, Jr., Larry Paulson, Lynn Salinger, and Robert Winterbottom, who carefully researched, identified, and wrote in depth about the most salient achievements in USAID's investments in agricultural development highlighted in this book.

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USAID also took a direct hand in producing AID's Legacy. The early interest in this project, generated by Anne Williams, was nurtured by Josette Lewis and Dawn Thomas in the former Office of Agriculture and by many colleagues who helped to identify the themes for USAID's achievements, including Zachary Baquet, Bahiru Duguma, and Kenneth Hasson. Robert "Woody" Navin and David Schroder supported AID's Legacy as CORs in the Bureau for Food Security for the task order under which AID's Legacy was carried out. Philip Steffen wrote the Introduction and the Looking Back, Moving Forward chapters to set the context for this book. As activity manager, Phil reviewed and guided the editing of all draft sections.

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This story, too important to be told by a single author, is the product of many voices.



KEN WIEGAND

PREFACE

The USAID logo depicts clasped hands of friendship and cooperation alongside the words “From the American People.” The efforts of USAID’s team through the years reflect America’s longstanding commitment to extend a helping hand to neighbors around the world. Working alongside partners and governments in classrooms, laboratories, markets and farmers’ fields, the Agency’s agricultural and rural development officers have carried this spirit of cooperation into the heart of Africa, foothills of the Andes and rice fields of Southeast Asia—and countless places in between.

The Agency’s work in agriculture and rural development during the past 50 years has been built around the goals of improving lives and livelihoods through collaboration, responsiveness to changing conditions, persistence and innovation.

Through USAID, the United States confronts the challenges of poverty, hunger, disease, illiteracy, injustice and environmental degradation, seeking solutions that will change the world and improve lives. USAID has continually pioneered new approaches in agricultural science, education, economics and social organization to improve the earnings potential and standard of living of rural and urban households. The Agency has joined with international partners to identify emerging issues and develop common solutions.

As a learning organization, USAID is committed to questioning the practicality, timeliness and impact of its efforts on an on-going basis. When circumstances dictate, USAID does not hesitate to change course. As a result, while not every initiative has succeeded, USAID has continually broadened its perspective and effectiveness.

AT LEFT: Congolese women spreading cassava chips to dry.

LEARNING FROM PAST RESULTS

Over its first half century, USAID has been at the forefront of agricultural development, the starting point of the process of economic transformation and growth.

USAID has done some remarkable things. The list of its achievements is long.

But in order to build upon past achievements, it is critical that they are well-documented. Despite the Agency's many agricultural accomplishments over the past fifty years, USAID has historically been less successful in recording, examining, and communicating the results of its work. At minimum, these results have not been communicated well to USAID's various constituencies—foremost its beneficiaries, implementing partners and government counterparts, but also Congress, news media, and other Departments within the U.S. Government—or even the American people.

Recounting USAID's Legacy in Agricultural Development is intended to fill in many of these blanks so that the Agency's leadership role and accomplishments in agricultural development are better understood at home and abroad.

Thus, the purpose of USAID's Legacy is to review, document and preserve USAID's agricultural development achievements; highlight best practices and challenges; and share lessons learned with USAID and its partners.

SCOPE OF "AGRICULTURAL DEVELOPMENT ACHIEVEMENTS"

The definition of "agriculture" for our purposes comes from the 2000 Famine Prevention and Freedom from Hunger Improvement Act, as cited in the *AID Agriculture Strategy* (2004):

AGRICULTURE

The science and practice of activities related to production, processing, marketing, distribution utilization, and trade of food, feed, and fiber.

This definition includes family and consumer sciences, nutrition, food science and engineering, agricultural economics and other social sciences, forestry, wildlife, fisheries, aquaculture, floriculture, veterinary medicine, and other environmental and natural resource sciences.

It also encompasses efforts to develop agricultural policies and institutions, such as research and extension services, that support agriculture and improve productivity to catalyze rural economic growth.

In this manner, agricultural development includes rural education, as well as programs that integrate agriculture with health, nutrition, education, microfinance, microenterprise and other rural enterprise, governance, and other development priorities.

USAID’s legacy in agriculture is not the result of any single project in any one country. Rather, it is constructed from the cumulative effects of decades of vision, resources, and effort.

Past efforts have contributed significantly to the food security of millions around the globe, but too many today still face debilitating poverty and hunger. Further agricultural development work will be needed to confront these problems now and prepare to meet the challenge of feeding more than nine billion people in 2050, all the while maintaining and nurturing the natural resource base on which such agricultural production depends.

METHODOLOGY

The Agricultural Legacy project could not possibly document all USAID initiatives in agriculture carried out around the world over the past five decades. This is a story, not a complete history.

Experienced USAID staff identified nine broad themes for defining USAID’s work in agriculture and rural development. Then, in collaboration with the firm, Weidemann Associates International, USAID explored the record and set criteria for identifying and selecting key achievements that advanced knowledge or demonstrated particularly striking results.

We interviewed scores of key experts—current and former policy advisers, project managers and implementing partners as well as four former Administrators. Relevant historical reports and documents were thoroughly searched and rigorously analyzed.

Achievements were selected based on a preset list of criteria, inspired in part by the IFPRI publication, *Millions Fed*:

CRITERIA FOR SELECTION OF ACHIEVEMENTS
.....

- » *Importance or proven impact*
- » *Catalytic, systemic, or transformative results*
- » *Sustainability*
- » *Scale and replicability*
- » *Time and duration*

Once the achievements were tentatively chosen, current and former USAID staff reviewed conclusions and provided feedback. This process is ongoing. USAID welcomes input and participation online at <http://www.agrilinks.kdad.org>.

The following chapters tell part of USAID’s story in agricultural development, a retrospective centered on the first 50 years, 1961–2011. But in countless communities across the globe, this story is still being written.



TANYA MARTINEAU/PROSPECT ARTS, FOOD FOR THE HUNGRY

EXECUTIVE SUMMARY

50 Years of Progress

More than half a century ago, the U.S. Agency for International Development (USAID) set out to fulfill President Kennedy’s charge to “bring newly developing countries . . . to a stage of self-sustained growth where extraordinary outside assistance is not required.” Agriculture was the key to this endeavor, with USAID pushing the frontiers of innovation to develop and advance best practices in agriculture and rural development. After helping champion the Green Revolution that more than doubled staple crop yields, USAID continued at the forefront of advances in agriculture, harnessing new technologies and strategies to boost productivity and better the lives of rural people, transform government’s role, and partner with the private sector to magnify impact. USAID has been—and remains—a frontrunner in agricultural development since its founding in 1961. USAID’s Legacy in Agricultural Development takes stock of USAID’s achievements, highlights best practices, and shares lessons learned to accelerate progress in nine key areas.

SECURING ACCESS TO LAND AND OTHER NATURAL RESOURCES

Reforming a country’s land tenure and property rights systems produces enormous benefits for agriculture. Working with local systems, USAID’s efforts to demarcate land holdings, reform land registries, and define property rights have helped transform agriculture around the world by prompting more efficient resource use. Secure land tenure and property rights motivate farm households to invest in productivity-increasing technologies and physical

upgrades to capture the full returns and use land rights as collateral for loan finance, driving economic growth. Land rights also strengthen incentives for better natural resource management, such as conserving soil moisture, terracing slopes, and planting ground cover. USAID support for indigenous groups at a disadvantage in formal legal settings has increased land tenure security within informal or customary settings, increasing local incentives for safeguarding resources. The Agency’s conflict-mitigation techniques have expanded natural resource rights and access, protecting biodiversity in the process.

MOBILIZING SCIENCE AND TECHNOLOGY

From the outset, USAID recognized that science and technology could catalyze game-changing breakthroughs in agriculture. USAID funding helped scale up the Green Revolution, producing history’s most dramatic increase in food production through the development of high-yielding cereal varieties. USAID has partnered with U.S. university scientists and host-country researchers to conduct research to boost crop and animal productivity, regenerate soils, manage pests, enhance nutrition, support science-based biotechnology, pioneer remote-sensing applications, and understand farming systems. Bringing together international and national agricultural research systems with different capacities and complementary expertise has resulted in fruitful collaboration. In 1971, USAID and other organizations formed the Consultative Group on International Agricultural Research (CGIAR), a partnership of international research

AT LEFT: Women walking among their fields in the Nyalungana swamp reclamation project, Democratic Republic of Congo. Thirteen thousand households gained access to newly-available land for cultivation due to this development food security activity funded by USAID.

A DYNAMIC HISTORY, SHAPED BY GLOBAL AND DOMESTIC EVENTS

Over the past half century, USAID's agricultural programs and policies have been shaped by Cold War urgencies, domestic priorities, expanding trade flows, and shifting foreign policy objectives:

1960s

The Cold War cast a shadow as USAID carried out stabilization and development alongside the military in Vietnam. At the same time, USAID provided key support to enable the Green Revolution.

1970s

The 1973 Foreign Assistance Act refocused USAID on the critical basic needs of the poor, including food production, rural development, and nutrition.

1980s

A new Administration with a private sector orientation prompted a fresh look at the growth-expanding power of private sector investments at home and abroad.

1990s

After the disintegration of communism in Europe, USAID set up 24 new Missions to help countries make the transition from centrally-planned to market-based economies.

2000s

September 11th 2001 prompted USAID to search for new ways through agriculture to expand opportunities, reach new markets, and raise rural incomes, including major efforts in Afghanistan and Iraq.

2010s

USAID staffs up and re-orient itself for agriculture as part of Feed the Future, a whole-of-government initiative to reduce hunger and poverty in 19 focus countries through agriculture-led economic growth.

centers. Over the years, USAID has provided more than \$1.4 billion to fund the CGIAR's work, estimated to have lifted food production in developing countries by 7 to 8 percent. USAID's success in transferring the benefits of science and technology demonstrated that agricultural research partnerships generate high returns.

INSTITUTING AGRICULTURAL EDUCATION AND TRAINING

Agriculture is a dynamic sector, requiring education, research, and extension systems that continually adjust to ensure relevance and increase productivity and profitability. USAID has been a major investor in the agricultural institutions of dozens of countries, and trained thousands of graduate-level students in the United States. These local institutions have provided education and training to scientists, extension officers, and farmers. USAID is turning to technology-based learning solutions to keep pace with the educational needs of today's globalized, knowledge-intensive agricultural systems. Expanding information and communication technology is creating new partnerships to improve agricultural institutional capacity. USAID's Legacy underscores how USAID draws upon an increasingly diverse set of public and private sector partners, opening new possibilities for integrated education and training to help individual and institutional capacities grow.

MANAGING MARKET PERFORMANCE

USAID has been an effective advocate for enabling environments that open markets

and promote competition. USAID-funded research and training has helped define the field of agriculture and food-system marketing in developing countries, leading to policy reforms that enable markets to perform better, expand the private sector's role, and open market opportunities to improve livelihoods. Clearly delineating public and private sector roles improves market performance and enhances efficiency. USAID learned that market-led growth requires a vibrant, competitive private sector, along with a toolkit of approaches and methodologies and the active participation of small farmers and other entrepreneurs. USAID has also promoted the public sector's role as a market referee to ensure fair and transparent regulations. With USAID's support, many countries have successfully made the transition from static state-dominated systems to dynamic market-based economies that are responsive to consumer quality standards and enhanced food safety.

FINANCING FARMERS AND FOOD SYSTEMS

The prevailing financial paradigm in the 1960s assumed that the rural poor required subsidized interest rates to stimulate the adoption of new agricultural technologies. In the 1970s USAID concluded that subsidized lending was financially unsustainable and seldom worked as intended. USAID's work with cooperatives helped advance a new approach to agricultural and rural finance based on competitive interest rates, secure deposits, stable institutions, and lower transaction costs. USAID's enthusiastic embrace

of small-scale lending helped lay the foundation for the modern microfinance system that now reaches more than 150 million people worldwide. More recently, USAID has turned to cell phones and other technologies, demonstrating their role in extending access to finance—savings, loans, and transfers—to dispersed rural populations at lower cost. USAID also piloted ways to defuse financial risk, including Development Credit Authority loan guarantees, weather-indexed insurance, and warehouse receipt systems, to build confidence in financial services and spur rural investment. USAID has learned that a country's financial institutions and regulatory framework must also be strengthened and streamlined for rural financial markets to work well.

APPRECIATING RURAL ENTERPRISES

USAID-sponsored research in the 1970s uncovered the presence of a profitable, non-farm rural sector generating labor-intensive employment and making efficient use of scarce capital. Rural enterprises, eager to respond to new incentives, often need help linking to outside markets and value chains to accelerate their growth. Starting in the 1980s, USAID embraced agribusiness and value chain projects that add value to food staples as well as high-value non-traditional crops. Between 1998 and 2010, USAID supported 240 value chain projects, investing over \$4.5 billion that produced \$14 billion in additional farm income, and more than 1 million new jobs. Women have been a significant focus, representing a substantial portion of the 19 million beneficiaries. The late 1990s marked a low point in USAID's

funding for agriculture, and the Agency launched the Global Development Alliance to leverage private matching funds along with new ideas, resources, and technologies to jointly tackle business challenges and development problems. Since 2001, USAID has forged over 1,000 alliances—many in agriculture—with more than 3,000 partners. New ventures, established with USAID seed capital, often attract private sector interest and lead to commercial deals with a lasting impact.

GETTING POLICIES RIGHT

Recognizing that well-functioning economies require stable policies and fair regulations that facilitate competition and growth, USAID has

worked with partners to get agricultural policies right. USAID-supported reforms have liberalized grain trading, streamlined business procedures, opened public enterprises to private investment, and made policy-making more transparent and predictable. Beneficial policies require sound research and analysis tailored to the local context; this requires a trained cadre of objective, critically thinking local analysts. USAID provided access to quality higher education to thousands of promising young scientists and analysts, bequeathing a critical mass of trained and experienced professionals in developing countries. The Agency has provided core support to national and international policy research institutions to help study and implement sound policy development. Over the years, USAID found

that it needs its own agricultural policy expertise to articulate the impact and incidence of policy alternatives.

EXPANDING AGRICULTURAL TRADE OPPORTUNITIES

An active proponent of the benefits of liberalized trade, USAID has worked to broaden access to trade treaties for emerging economies and sharpen their trade-negotiating skills. USAID's achievements include helping Central American and Caribbean countries reach trade agreements under the Central American Free Trade Agreement, improving competitiveness, attracting



PHILIP STEFFEN

Women waiting for millers to grind their grain in eastern Ethiopia, 1974. Agriculture was a major program focus of USAID in the first part of the 1970s.

investment, and encouraging trade-led agricultural diversification. USAID achievements in trade facilitation, institutions, and policies have had a significant impact on expanding agricultural trade flows. Promotion of non-traditional agricultural exports, a key USAID strategy, has contributed to diversified livelihoods, increased incomes, and better diets, creating year-round jobs for thousands of underemployed rural people. To cement these gains, USAID has helped improve market information systems, equipping governments to gather, analyze, and act on trade-related data and market opportunities. A critical lesson is that taking full advantage of trade-led opportunities requires strategic decisions as well as sustained investments to increase productivity and reforms to address labor standards, gender equity, environmental impacts, and threats to food safety.

WORKING WITH THE EARTH

Over the past five decades, USAID has been a leader in integrating environmental considerations into agriculture, developing approaches that other countries, communities, and donors have adopted and modified. Drawing from U.S. experience, USAID has extended the use of drip irrigation, fertilizer micro-dosing, integrated pest management, agroforestry, and sustainable water use planning and management. USAID has also developed a comprehensive approach to incorporating environmental standards and practices into all facets of its work, promoting good agricultural practices, and certifying food commodities as sustainably produced. USAID

has shown that leveraging millions of dollars with private investors and donors to develop agricultural subsectors—such as environmentally sound coffee value chains—can achieve sustainable results. Improving natural resource management practices of rural agricultural enterprises, upgrading natural resource extension services, and strengthening the capacity of grass-roots rural organizations are helping countries identify and institutionalize best practices.

LOOKING BACK, MOVING FORWARD

USAID has played a major role in translating the breakthroughs of the Green Revolution and other agricultural innovations into better lives and a healthier planet—and new advances are rolling out every day. The Agency's work has spread the benefits of scientific and technological progress to help millions of people achieve food security and look to a brighter future. USAID has learned that monitoring and evaluation are essential for measuring impact, cataloging knowledge and learning lessons. Continuing activities long enough is also critical to maximizing impact and sustainability. New efforts like the President's Feed the Future initiative are part of a comprehensive approach that links higher agricultural productivity and incomes with improved health and nutrition, particularly for children and mothers. Recognizing that its resources are finite, USAID is increasingly using partnerships to extend its reach, efficiency, and impact while building durable global alliances to improve lives and meet the challenge of feeding the world's billions.



OVERVIEW

USAID's Legacy in Agricultural Development, 1961–2011

Authorized by the Foreign Assistance Act and officially established in November 1961, the U.S. Agency for International Development—USAID—became the first American foreign assistance organization whose primary emphasis was on long-range economic and social development assistance efforts.

Around the globe, hunger stalked the poor and very poor in the cities and countryside. Even though most of the people worked in agriculture, getting enough to eat was a continual struggle. Recognizing this crisis, USAID called on America's tremendous resources in agriculture—its hands-on approach and practical know-how—to help it find solutions.

I. OUR LEGACY: SHAPED BY WORLD EVENTS AND DOMESTIC DEVELOPMENTS

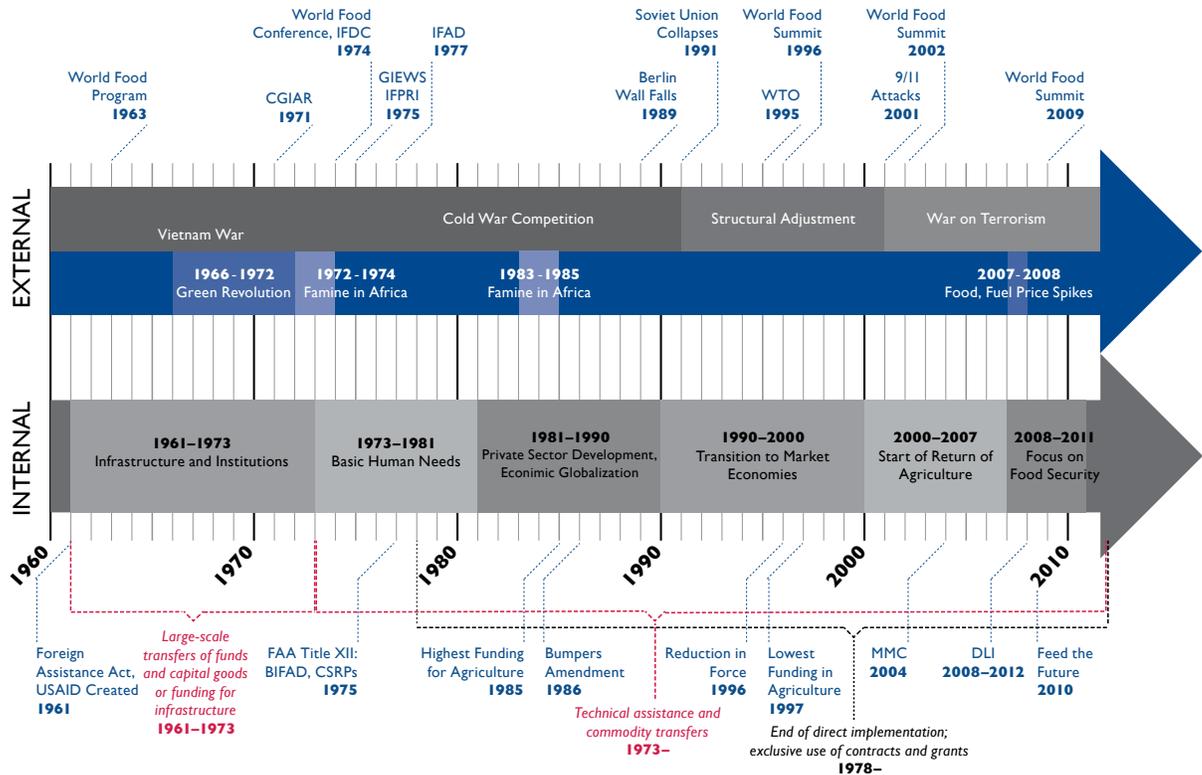
The story of USAID's Legacy in Agriculture is directly shaped by the story of USAID and the foundation laid by its predecessors dating back to the Point Four Program launched in 1949. Over the past half century, USAID's projects, programs and policies in agriculture have been tempered by internal and external events—Cold War urgencies, competing domestic priorities, devastating famines, expanding trade flows and shifting foreign policy objectives.

Figure 1 shows the major events and themes that shaped USAID as an Agency and its focus on agriculture. The top two rows show the major foreign policy themes and defining world economic events. The bottom row traces the main themes of USAID programming generally. Developments in each row had implications for USAID's investments in agriculture and rural development.

ENLISTING IN THE COLD WAR The Cold War cast a long shadow over much of USAID's history. In Vietnam, USAID carried out a major stabilization and development effort alongside the military. After 1967, Agency agriculturalists of all skills participated in the joint military-civilian counterinsurgency program known as CORDS. This was part of the biggest build-up of USAID employees ever. Outposted in rural hamlets and

AT LEFT: Fatouma Guindo is the wife of the Djanwelli village chief in the county of Bankass, Mali. She is happy that her husband applied the microdosing technology promoted by USAID.

FIGURE I: MAJOR EVENTS AND THEMES THAT SHAPED USAID'S AGRICULTURAL PROGRAMS.



villages, these agriculturalists offered technical training and advice to farming households and communities in an attempt to neutralize the appeal of the Viet Cong. The far-reaching “land to the tiller” land reform of 1970–73, a South Vietnam Government initiative preceded by USAID-funded field research and technical assistance, redistributed land to 1 million tenant farmers and boosted rice production by 30 percent, thereby sapping Vietcong recruitment, but came too late to change the course of the war. The success of these efforts was limited by the weaknesses of the South Vietnam Government that ultimately led to its downfall. Community development, part self-help

and part rural development, was another strategy used by USAID to help politically unstable countries besides Vietnam.

SHIFTING DIRECTIONS TO TACKLE POVERTY Disillusionment with the Vietnam war led many Americans to disparage foreign aid and question its rationale. Congress called for change. The Foreign Assistance Act of 1973 redirected USAID’s bilateral assistance through a New Directions Mandate. Also known as the Basic Human Needs mandate, Congress directed USAID to collaborate with host country development planning units, give highest priority to activities that directly improved the lives of the

poorest people and concentrate in a few key areas of prime concern to them—especially, agriculture, rural development and nutrition.

GEARING UP TO FIGHT GLOBAL HUNGER

About the same time that the Green Revolution—input-intensive, higher-yielding improved wheat and rice varieties that fed millions—was taking root in Asia, a catastrophic drought and famine stretched across the Sahel to the Horn of Africa, riveting global attention. Under the shadow of this food crisis, the first World Food Conference in 1974 set up new international mechanisms and multilateral organizations, such as the International Food Policy Research Institute (IFPRI), Global Information and Early Warning System (GIEWS) and the International Fund for Agricultural Development (IFAD), that gave USAID new partners and more opportunities for collaborating in agriculture. Also in the late 1960s and early 1970s, USAID helped to set up and fund the emerging network of Consultative Group on International Agricultural Research (CGIAR) centers, expanding beyond the International Maize and Wheat Improvement Center (known by its Spanish acronym, CIMMYT) and the International Rice Research Institute (IRRI), already established with support from the Rockefeller and Ford Foundations. USAID Missions devoted major resources to building national agricultural research systems (NARSs) around this time, as well as ministries, universities and other institutions. USAID propelled Green Revolution progress by supporting investments in input supply networks, land titling, agricultural research and extension, education, policies, and roads and other infrastructure.

Through the Title XII Famine Prevention and Freedom from Hunger legislation in 1975, the U.S. Congress created the Board for International Food and Agricultural Development (BIFAD) to advise the USAID Administrator on food security issues and the role of higher education in international agricultural development. The increasing complexities of international food and agricultural issues have given renewed prominence to BIFAD and greater weight for its advice. The Title XII legislation also established the Collaborative Research Support Programs (CRSPs), long-term, multi-disciplinary agricultural research and training programs between scientists in American and developing country universities, and national and international research centers. Now embedded within USAID's agricultural landscape, the CRSPs are an important part of USAID's agricultural research identity and outputs.

PROMOTING THE PRIVATE SECTOR AND ECONOMIC GLOBALIZATION In the early 1980s, an economic recession and high unemployment in the U.S., as well as a new Administration with a private sector orientation, prompted a fresh look at the job-creating and growth-expanding powers of private sector investment—at home and abroad. As a corollary, USAID recognized that the public sector needed to establish and enforce the policy and regulatory environment that enables the private sector to flourish.

USAID reversed course from its efforts to strengthen public sector agricultural marketing boards and government-run farmer cooperatives, for example, and began to work directly with local private sector producers, processors and marketers

TAIWAN: GROWING PROSPERITY THROUGH AGRICULTURE

USAID stands tall on the shoulders of several predecessor agencies and commissions. One of them was the Sino-American Joint Commission on Rural Reconstruction (JCRR), established in 1948 on the Chinese mainland and shifting to Taiwan in 1950. During the 1950s and 1960s, the United States delivered economic aid, technical assistance, and agricultural commodity aid through the JCRR totaling \$7.106 billion in current dollars. These funds were supplemented by the sale of agricultural commodities that generated an additional \$4.050 billion in local currencies, saving scarce foreign exchange and paying the local currency costs of road construction as well as land and water resources management.

From 1951 to 1965, one-third of U.S. government aid to Taiwan (Republic of China) was channeled by the JCRR into agriculture, directly contributing to more productive crops and animals, irrigation development and flood control, soil improvement, and rural credit programs and cooperatives. The JCRR carried out improvements in agricultural research and extension as well as fertilizer supply, farm credit, land tenure systems, and marketing facilities and practices. In addition, the JCRR played a leading role in agricultural policy formulation, planning, and programming. Training agricultural

technicians in the United States expanded Taiwan's human resource capacities and increased its technical competence for carrying out agricultural development programs. The combined stimulus of land reform, investments in water development, and accompanying agricultural and marketing assistance helped to boost agricultural production to an average annual growth rate of 4 percent between 1952 and 1959, outpacing average population growth of 3.6 percent. Concurrent economic aid provided much of the capital to build up industries that supported agriculture.

USAID was already established by the time U.S. economic aid to Taiwan was formally phased out in 1965—making Taiwan one of the first “graduates” from U.S. assistance. The early investments by the JCRR, followed by those of USAID, yielded very substantial returns. Today, the JCRR is widely credited with catalyzing the agricultural prosperity that accelerated Taiwan's economic expansion in the 1970s and 1980s, even allowing Taiwan to sponsor its own agricultural technical assistance program. Taiwan's agricultural development would have been much slower if foreign aid had not been wisely invested for long-term growth and prosperity.

of food and agricultural products, and other entrepreneurs—the genesis of the Agency’s now acclaimed leadership in forming and upgrading agricultural value chains. From a domestic-focused agribusiness approach, it was a natural progression for USAID to add an export-focused approach, emphasizing non-traditional crops, and the beginnings of the Agency’s role in globalized agricultural markets. Even before the end of the decade, the focus of attention to the Basic Human Needs mandate shifted from agriculture to health and child survival.

WELCOMING NEW PARTNERS AFTER THE COLLAPSE OF COMMUNISM After the steady disintegration of Communist regimes in Europe, USAID set up, in an astonishingly short time starting in 1992, 24 new Missions in Russia, the former Soviet republics and Eastern bloc countries as well as a new Europe and Eurasia Bureau in Washington to service them. New opportunities opened for the Agency to support the full

of agriculture programs, but especially helping to guide the transition from centrally-planned to market-oriented economies and acquainting farmers, processors and traders with meeting consumer-driven demand for higher food quality and safety standards. Many of these countries, having “graduated” from USAID support, are now fully integrated into global economic and financial markets and institutions.

Not long after the rapid post-Soviet build-up of USAID Missions, the Agency downsized almost as abruptly. Severe budget cuts forced USAID to make painful cuts in staff, close 11 Missions and downgrade a dozen others in 1996. Funding for agriculture dropped to its lowest point in 1997.

SEEKING A POST-9/11 PURPOSE Just as the collapse of Communism led to a search for a post-Cold War rationale for U.S. development assistance a decade earlier, the attacks of September 11 prompted a new search for both relevance and effectiveness in confronting the conditions that give rise to terrorist threats and insecurity that stifles economic growth. USAID expanded its assistance programs in Afghanistan



MOHAMMED GHANI KHAN

Following devastating floods in Pakistan in 2010, USAID joined other donors in providing improved seeds and fertilizers to over 410,000 farmers accelerated agricultural recovery.

and Iraq as part of broader U.S. foreign policy. Agency agricultural officers served on Provincial Reconstruction Teams, restarted markets for traditional higher-value crop and animal products, and sought to lay the groundwork for viable livelihood alternatives to the corrupting influence of poppy production; USAID has supported similar alternative livelihoods in the Andean region of South America. While USAID works more closely with the State Department and U.S. military, its new programs attempt to manage and mitigate conflict, reduce poverty, improve democracy and governance—and rebuild agriculture.

2. OUR LEGACY: SHAPED BY AGENCY BUDGETS, STAFFING AND AGRICULTURAL POLICIES

DECLINING BUDGETS Funding for agriculture has expanded and contracted over time, reflecting shifts in Agency policies and emphases. The New Directions Mandate of 1973, the first funds for the Sahel Development Program in 1974 and Title XII legislation in 1975 that launched the CRSPs contributed to a surge in funding. However, agriculture’s share of all USAID funding declined from well over 50 percent in 1979–81, to about 40 percent in 1986–87, to just over 30 percent at the beginning of the 1990s, and to its lowest point, 4 percent, in 1997 as agriculture fell out of vogue. Due to rising agricultural productivity, the world was “awash in grain” and abundant food and affordable prices were taken for granted. USAID’s funding for agriculture bottomed out at \$245 million, also in 1997.

In real dollar terms, the decline is all the more noticeable. As the Administrator, Rajiv Shah, testified to Congress in 2010, “In 1982, USAID had an agricultural budget of \$1.2 billion. That is equivalent to \$2.9 billion today.” By comparison, the Agency’s Congressional Budget Justification requested \$1.062 billion for agriculture in FY 2011. Congressional directives and earmarks for agriculture have been small and irregular, in contrast with much larger earmarks for biodiversity conservation and forestry, for example.

DOWNSIZING AND OUTSOURCING: DOING MORE WITH FEWER STAFF The size of funding and staffing go hand in hand. After reaching a high-water mark of 18,030 employees in 1968 when more than one-fourth of the Agency’s workforce served in Vietnam, the total number of U.S. and foreign direct-hire staff steadily declined to 6,800 in 2009. Technical officer and project manager functions were folded into one position, leaving less time for an agricultural officer to devote to advisory and development efforts.

The New Directions Mandate in 1973 was good for agriculture. More technical assistance in agriculture required more agricultural officers. The Agency couldn’t hire enough of them. The peak number of 283 agricultural officers in 1985 fell short of the authorized level of 316. Thereafter, fewer agricultural officers reflected lower funding. Agriculture was relatively spared by the reduction in staff a decade later—if only because agriculture was already in decline as a sector and personnel category. By 1999, only 47 agricultural officers remained on board.

An American agricultural advisor meets with farmers in Turkey. Based on the tractor model and U.S. foreign aid decal on the tractor, this photo dates from the early 1950s during the time of one of USAID's predecessor agencies.



USAID ARCHIVES

Counting only U.S. direct-hire employees, however, would be misleading. By far, the biggest complement of USAID staff is its Foreign Service Nationals (FSNs), about 60 percent of all personnel since 1995. Agricultural FSNs are a fount of knowledge about national and local agricultural systems, institutions and policies. These FSNs offer indispensable language skills, institutional memory, and continuity to offset the rotations in and out of Foreign Service Officers. They hold increasingly responsible positions. USAID also hires agriculturalists in other personnel categories, some through the U.S. Department of Agriculture (USDA), to fill its staffing gaps.

OUTSOURCING: INCREASING RELIANCE ON CONTRACTS AND GRANTS For much of its first two decades, USAID agricultural officers used to do their own work, like setting up production trials, training farmers and supervising village projects. Now, with fewer employees to manage resources and programs, USAID implements its activities through contracts and grants with U.S. and foreign development consulting firms, non-government organizations (NGOs), private voluntary organizations (PVOs), foundations and public international organizations (PIOs). USAID

supports strengthening grants to NGOs and PVOs to improve their effectiveness. Over the past few decades, the value of USAID contracts and grants has ballooned.

This business model—extensive reliance on thousands of contractors and grantees known as “implementing partners”—has its share of detractors and supporters. Detractors say that outsourcing agricultural activities distances USAID personnel from the reality on the ground and lengthens the chain of accountability, pads partner profits, and reduces the amount of funding for agricultural programming. Those who support outsourcing argue that agricultural contractors are indispensable; they provide flexibility and meet the exact specifications in USAID contracts in terms of cost, timing, skills and services.

Moving forward, USAID will be carrying out reform efforts to broaden its partner base and build the capacity of local institutions in host countries.

EVOLVING AGRICULTURAL POLICIES AND PRIORITIES The first statement of agricultural policy for USAID was embodied in the Foreign Assistance Act itself. It spelled out what funding could be used for—alleviating starvation, hunger and malnutrition—and who should benefit—small farmers and the rural poor. Agricultural research

was to prioritize the welfare of small farmers and meet the test of small farmer acceptance.

The 1982 Policy Paper on Food and Agricultural Development made a break from the economically costly “food self-sufficiency” approach that some governments had adopted in the wake of the 1970s food crises in favor of the more realistic concept of “food self-reliance,” involving economically viable production and trade options based on comparative advantage. Several years later, after objections from some agricultural commodity associations, Congress banned the use of U.S. foreign assistance for agricultural research and development of agricultural commodities that would compete with U.S. exports of similar commodities. By

and large, the impact of this legislation was manageable, although Missions must still ascertain that their commodity improvement programs would not cause significant financial harm to U.S. exporters. Also in the 1980s, the Agency shifted from a commodity-centered approach to a broader farming-systems and rural development approach.

When the Agency started to promote agribusiness development, natural resource management and policy reform dialogue, some USAID agricultural officers successfully shifted into these new areas. With less funding for agriculture, the Agency lost a good part of its agricultural officers and expertise to attrition during the 1990s.



WINROCK INT'L

Farmers in southern Kyrgyzstan learn how drying their tomatoes can diversify their business.

After a lapse of more than twenty years, USAID approved a new agricultural strategy in 2004, advocating trade and market linkages; sustainable agricultural systems; science, technology and innovations; and agricultural education and training. This new strategy marked the Agency's renewed commitment to agriculture—and a return to some of the basics of the past.

3. OUR LEGACY: SHAPED BY A CHANGING FOREIGN AID LANDSCAPE AND CALLS FOR REFORM

With the turn of the century, and especially after 9/11, Official Development Assistance (ODA) attracted renewed interest across the U.S. government. A good part of development assistance became centralized within the State Department during the 2000s because of its budgetary and institutional links with the President's Emergency Plan for AIDS Relief (PEPFAR), set up in 2003 and renewed in 2008, and the Millennium Challenge Corporation (MCC), set up in 2004, to provide financial assistance to a limited number of countries selected for their good performance in economic growth and poverty reduction. USAID closely collaborates with PEPFAR, MCC and State. USAID and State now use a common Foreign Assistance Framework—agriculture was put into the Economic Growth objective—and a joint planning, budgeting and reporting processes. For the first time, funding for the Agency's agricultural programs could be easily aggregated and reported

to senior managers and key constituencies, particularly Congress.

Meanwhile, the entry of the Department of Defense into foreign economic assistance is a recent but rapid phenomenon driven by its directive to stabilize and build capacity in war-torn countries. By FY 2009, 19 U.S. Government agencies were funding foreign economic assistance activities, of which USAID was the largest in terms of obligations (35.5 percent).

RISING ROLE OF PRIVATE AID FLOWS Yet, public foreign assistance has been dwarfed by the rapid growth of private capital transfers to developing countries. Today, about 87 percent of all these financial transfers flow from private direct foreign investment, international bank loans, remittances, donations from corporations and foundations, university scholarships, and charitable groups. In stark contrast to total U.S. ODA of \$28.8 billion in 2009, total net private capital flows reached \$262.2 billion. Remittances from the U.S. alone reached an estimated \$90.7 billion—more than 3 times greater than official American aid.

Recognizing this new reality, 10 years ago USAID set up its Global Development Alliance, an innovative public-private model for improving social and economic conditions in developing countries. By focusing on business interests, as well as philanthropic motives, these public-private alliances are co-designed, co-funded and co-managed by partners so that the risks, responsibilities, and rewards of the partnership are equally shared. USAID has established itself as the global leader in alliance building. By 2010,

USAID had formed more than 900 alliances with over 1,700 distinct partners to leverage more than \$9 billion in combined public and private resources. Up to 20 percent of these Alliances have focused on agriculture and food security.

CALLING FOR FOREIGN AID REFORM Some expected the importance of foreign assistance to wane after the end of the Cold War, but 9/11 changed that view. By the mid-2000s, a chorus of voices was calling for a reappraisal of the U.S. foreign aid architecture. Critics charged that foreign assistance programs were costly, duplicative, poorly coordinated, inflexible to changing conditions, understaffed and underbudgeted, and in need of modernization. A Congressionally-mandated commission famously called the foreign aid system “broken.” Among other recommendations, fixing the system required rewriting the long, complex and ‘badly out of date’ Foreign Assistance Act; formulating a visionary and coherent national foreign assistance strategy; merging all foreign assistance programs into a Cabinet-level department; aligning development and trade; and playing more to U.S. strengths while seeking partners.

USAID attracted a great deal of this attention. Concerned that development work would be driven by diplomatic and military objectives, foreign aid advocates called for giving USAID greater operational, budgetary and policy autonomy; overhauling its procurement and contracting systems; and securing more resources. USAID issued its own reports explaining why foreign aid mattered. Most voices recommended that the Agency focus on a few core competencies.

Significantly, one of these was reviving agriculture for development.

REAFFIRMING THE STRATEGIC IMPORTANCE OF DEVELOPMENT AND

USAID’S ROLE The Foreign Assistance Act remains in place, but changes are underway. Coming in close succession in 2010, three U.S. Government strategies reaffirmed the critical status of development, USAID’s role in it, and the approaches to make this work. The latest National Security Strategy reiterates the importance of development as a vital component of U.S. foreign policy and national security and calls development “a strategic, economic, and moral imperative.” Four months later, a first-ever Presidential Policy Directive on Global Development (PPD) recognized that sustainable development remains a long-term proposition. Most critically for USAID, the U.S. Government pledged its “long-term commitment to rebuilding USAID as the U.S. Government’s lead development agency—and as the world’s premier development agency”—by developing forceful policy, budget, planning, evaluation and operational capacities.

Complementing the PPD, the first Quadrennial Diplomacy and Development Review (QDDR) was a “sweeping assessment” of how the Department of State and USAID could become more efficient, accountable, and effective together. Both would shift from an aid to an investment approach, strengthen partnerships, invest in “game-changing” innovations and technologies, focus resources for greatest impact, including food security, and seek the necessary resources from Congress to carry out these plans. The QDDR

grants USAID the authority to recruit more personnel, reform contracting and procurement, and plan and budget for results.

4. OUR LEGACY: BUOYED BY A RENEWED RECOGNITION OF THE ROLE OF AGRICULTURE

WAKING UP TO AGRICULTURE'S

CONTRIBUTIONS IN REDUCING HUNGER AND POVERTY

Even though the rate of yield increases of the main food staple crops slowed below population growth in the 1980s and 1990s, many national governments and donor agencies continued to underinvest in agricultural productivity and capacity. In some years, the cost of emergency food aid exceeded a Mission's agricultural development budget. This underinvestment reflected a failure to understand the central role of agriculture in generating sustainable economic growth. According to the World Bank's *World Development Report* on agriculture in 2008, growth in agriculture usually creates more jobs and income growth than in other sectors. Agricultural productivity growth reduces poverty by driving down the real cost of food, the major item in the consumption basket of the poor, and significantly increases food consumption and dietary diversity. Agricultural growth, moreover, contributes to a more equitable distribution of income.

Regrettably, it took a global food crisis in 2007–08 to wake up to agriculture's contributions. Commodity prices more than doubled in less than a year, pushing the number of malnourished people above 1 billion in 2009 and driving desperate people to riot in more than 30 countries.

New partnerships, coalitions, councils, think tanks and NGOs, as well as influential members of Congress and others called for USAID to acknowledge agriculture's contributions and reinvest in agricultural research and development, education and extension, and longer-term university degree programs; modernize small-holder agriculture; and expand public-private partnerships to support food processing and trade.

A prominent effort during this decade, the President's Initiative to End Hunger in Africa (IEHA) was launched in 2002 as USAID's primary agriculture initiative to help increase agricultural productivity and incomes in eight target countries. IEHA was the main mechanism for reaching smallholder farmers through dissemination of new technologies and support to public-private partnerships (PPPs) that link farmers to technology, markets and finance. IEHA also demonstrated the effectiveness of supporting country-led agricultural strategies.

STAFFING UP AND GROWING THE BUDGET

Agriculture represented just 5.2 percent of the USAID portfolio in FY 2003, compared to 14.0 percent for non-emergency food aid. In 2009, the President pledged to double the size of the agriculture budget by 2010. Over the decades, the Agency had fewer people doing more work. This was reflected in a 2008 article published in *Foreign Affairs*, in which three former USAID Administrators argued that the downsizing of U.S. direct-hire personnel was responsible for a dramatic loss of technical expertise.

Continued concern about staff workloads and effectiveness led the Agency to expand its

recruitment, but too few new officers were hired to keep pace with retirements and other attrition. A big break came in 2008 when USAID got bipartisan support from Congress to double its Foreign Service Officer work force from 1,200 to 2,400 Officers between FY 2009 and FY 2013 under the Development Leadership Initiative (DLI). To staff up for the return of agriculture and the Feed the Future initiative (below), 105 of these new positions were set aside for agriculturalists, including more mid-career officers. Over the past four years, 79 new agriculture officers have been brought on board, and most of them are now serving in the field.

LEADING THE FEED THE FUTURE INITIATIVE Responding to the global food crisis, the United States announced a global food security initiative with solid donor backing and led by partner countries willing to develop comprehensive investment plans and commit their own resources to agricultural and market development. Later in 2009, President Obama pledged \$3.5 billion over three years as the U.S. contribution to this \$22 billion international endeavor.

The U.S. component of this global food security initiative is known as “Feed the Future.” Its goal is to sustainably reduce hunger and poverty in 19 focus countries by bridging inclusive agriculture-led economic growth and improved nutritional status, especially for women and children. Strategically coordinated with all partners and stakeholders, Feed the Future committed to:

- » reduce poverty by 20 percent, on average, in all zones where Feed the Future was operating;

- » reduce stunting by 20 percent, on average, in children under five;
- » generate \$2.8 billion in agricultural GDP through research and development activities; and
- » leverage \$70 billion in private investment in agriculture that links smallholder farmers to viable market opportunities.

Despite starting with diminished budget and staff, USAID quickly geared up to lead this “whole of government” initiative. It builds on the processes, partnerships and institutions developed for IEHA as well as the Global Hunger and Food Security Response started in 2008 under President Bush.

In USAID’s vision, a modern agricultural sector must be economically efficient *and* environmentally sustainable while pushing the frontiers of research and development to meet the challenges of the next fifty years.

5. OUR LEGACY: REFLECTING A BROAD SPECTRUM OF ACHIEVEMENTS IN AGRICULTURE

USAID has gone through highs and lows in the past half century—from the heyday of big budgets and staffs to lean times of attrition and uncertainty. Both the character of the world in which USAID operates and the basis for USAID’s agricultural investments have changed significantly since the Agency was established fifty years ago.

Yet, against this ever-changing global and domestic backdrop, USAID has steadfastly promoted the structural and technological

transformation of agriculture, driven by increasing productivity that allows fewer farmers to feed more people, freeing them to shift to higher-value crops and spur job creation in off-farm value chains, while reducing the need for food aid. To manage this transformation, USAID has been at the forefront of a host of agricultural development innovations and their applications.

USAID's investments and innovations in agriculture have contributed significantly to the growing body of development knowledge, practice and partnerships, based on first-hand experience and learning. Development progress takes time, measured in increments and setbacks. Indeed, agricultural development is a long-term learning process for which success seldom comes without failures. The narrative that follows includes both, particularly where near-term "failure" led to learning moments and systemic improvements—rethinking assumptions, adjusting programs, and monitoring progress—that achieved success over time.

Over the past half century and before, USAID's achievements, and those of its predecessor agencies, can be grouped around nine themes. They give a glimpse into some of the many different ways that USAID has led in the global field of agricultural development and how that legacy continues to unfold.

1. Promoting land tenure, land markets and property rights to secure access to land and unleash its productive potential;
2. Intensifying agricultural productivity by mobilizing science and technology research to raise yields, increase supplies and lower the cost of food;
3. Building agricultural education institutions through applied technical assistance and mentoring, in partnership with U.S. universities and foundations, to strengthen human capacity and extension services for technology adaptation, training and diffusion;
4. Supporting research and technical assistance to improve market institutions, infrastructure, services and performance to increase production and productivity incentives, as well as food availability and access;
5. Linking rural people and organizations to financial services to stimulate savings and investments;
6. Investing in small and medium rural agricultural enterprises, including value chains, to create jobs, reduce waste, and add value;
7. Developing agricultural and food policy research and analysis capacity to inform policy decisions and enable commercial environments;
8. Expanding global and regional agricultural trade opportunities through trade liberalization and regional trading organizations and food quality and safety assurance; and
9. Integrating environment and natural resources management into agricultural practices and livelihoods.

The sections that follow explore these achievements in more detail.

ONE

Securing Access to Land and Other Natural Resources

LAYING THE FOUNDATION FOR AGRICULTURAL DEVELOPMENT, ECONOMIC GROWTH AND FOOD SECURITY

Marciana Soares, a small-scale farmer in Timor-Leste's Liquica district, thought her family had a home for life.

She held no title to the land upon which they lived, but tradition dictated that when her family received it as a marriage gift, its ownership would be unchallenged. But in 2002, the original owners wanted the land back.

Fearful of losing her home, Ms. Soares sought the assistance of staff from the USAID-sponsored Ita Nia Rai—"Our Land"—program set up to help the newly independent but politically unstable Southeast Asian nation deal with the problem of murky property rights following the wartime destruction of land records and mass displacement of population. Although the land dispute was lengthy, the original owners ultimately agreed to turn the land over to the Soares family so that they could apply for official title under the Timor-Leste government's land program.

With USAID's help, Marciana Soares has registered a claim to her land and now has greater tenure security.

The conflict resolution approach method that aided the Soares family is just one example of the Agency's efforts to strengthen land tenure and property rights in East Timor and across the globe. But for one family, and thousands more like it, USAID's mediation made all the difference.

Before farmers can participate effectively in the agricultural economy, they must have secure access to land and resources. In its first 50 years, USAID's work in land reform, land certification and titling, and conflict resolution has provided security and opportunity for rural families and communities around the world. Property rights are the "hidden infrastructure of economic growth." Property rights, whether informal or formal, hold capitalist economies together and help propel them forward through private investments that lower costs, increase output, and start new businesses.

The origins of USAID's work in land tenure and property rights trace back to efforts of its predecessor agencies. In post-World War II East Asia, U.S. reconstruction and land

AT LEFT: Julio Jankoña, a Bolivian farmer in the Chapare region of Bolivia, proudly shows his legal land titles.

reform efforts redistributed vast tracts of land from big landlords to small farmers. In 1962, USAID established the Land Tenure Center (LTC) at the University of Wisconsin to carry out research and training on land tenure, initially in Colombia and Chile. Over the next four decades with continued USAID funding, the Center became the world's leading university-based institute on land policy. During the late 1980s to early 1990s, USAID/Niger engaged in a major way on the development of Niger's Rural Code, for which LTC staff made an important contribution, as they did for similar work in Madagascar. In 1990 USAID-funded studies at the Center examined local perspectives on formal versus informal methods of assuring land ownership. To the surprise of many, these studies indicated that many farmers felt relatively secure in their land ownership under informal systems without legal titles. While this seemed counter-intuitive to USAID experts who assumed that formal titling approaches were best, the Agency adapted its approaches to property rights to meet the needs and expectations of local farmers.

The absence of clear property rights for the poor exerts a heavy drag on economic growth, as evidenced by findings of the Institute of Liberty and Democracy (ILD). Beginning in the 1980s, USAID has helped to fund the ILD, based in Lima, Peru, and the work of its visionary founder. ILD has raised awareness that the poor are usually unable to generate wealth because their ownership of land and property is not recognized. A four-year study in Egypt by ILD, funded by USAID in 1999–2004, focused on the property rights in urban and peri-urban neighborhoods. The study's

most jarring finding was that Egypt's informal economy was the largest provider of employment in the country, that over 90 percent of Egyptians "held" property without legal title, and that these properties comprised a substantial portion of the country's private capital. The value of this property, about \$350 billion at the time, was effectively frozen because without clear property rights, it could not be used as collateral, thus limiting the property owners from obtaining formal loans to expand their businesses, legally tapping into electricity and water utilities, or passing on property. ILD contributed to the empowering of the poor by recommending a roadmap for comprehensive legal and institutional reforms that allow the poor to leverage their property into improved, sustainable livelihoods. ILD research showed that enhancing property rights has strong economic as well as social justifications for the many land reform, certification and titling projects that USAID has funded.

Even ownership of small, homestead-size plots of land lets a family build a house, grow seasonal vegetables, keep a dairy cow, and increase their incomes to eat better, keep their children in school and invest in their land without fear that it might be taken. For many poor, their land is their main asset and safety net. Thus, another institution that USAID supported over a long period is the Rural Development Institute at the University of Washington, now called Landesa, that helps design legislative, policy and programming solutions and guidelines for formulating land rights that have benefited millions of households over the past four decades.

DEFINITIONS

ACCESS The right or privilege to enter or use private property or common property, such as water, land, forests or other resources, as well as the right or privilege to deny access or use.

CUSTOMARY TENURE Often associated with indigenous cultures, customary tenure refers to traditional or other widely-recognized land ownership or land use rights.

GENDER EQUALITY IN LAND TENURE AND PROPERTY RIGHTS Considerations of gender, the socially and culturally defined rights and responsibilities between men and woman, may have a great bearing on the equality of access to land and other resources. A woman is at a disadvantage where customary and/or formal law doesn't recognize land ownership outside that of her husband or land inheritance rights after the death of her parents, husband or brother. This has a ripple effect when the woman cannot borrow money against the land as collateral to improve her farm or invest in other productive uses.

LAND POLICY An authoritative statement of the intentions and objectives of government for the country's land sector. It is only as good as it can be enforced.

LAND REFORM The generic term for modifications in the legal and institutional framework governing land policy. Land reform is intended to implement changes in land

policy that are designed to bring about desired changes in a changing political, economic and social environment in the interest of efficiency and/or equity. The most common types of land reform are probably those dealing with reallocations of land and those redistributing legal rights of ownership.

LAND TENURE The relationship among people—whether legal or customary—regarding land and associated natural resources. Rules of tenure define how property rights in land are to be allocated, transferred or inherited within societies. Land tenure systems determine who can use what resources, for how long, and under what conditions.

PRIVATE PROPERTY Private property and the associated rights of ownership are a keystone of market economies. In countries with written constitutions, the right to hold private property is usually enshrined as a fundamental human right.

SECURE TENURE Involves the degree of recognition and guarantee of land rights and/or access to natural resources. Improving security of tenure may help to encourage investments to improve the productivity of agriculture; to conserve and use natural resources soundly; to encourage the use of temporary rights for the use of land including leasing; and to reduce the number and the intensity of conflicts relating to the use and buying and selling of land.

Through its support to the Assets and Market Access Collaborative Research Support Program (AMA-BASIS CRSP), USAID also contributes to long-term research on underlying constraints to land access and secure tenure, and informing policy and program design so land and other markets work well.

Since the 1990s, USAID has significantly broadened the geographic scope of its work in land security. The Agency responded to the fall of the Soviet Union by helping Eastern European countries, and the former Soviet republics, transform their economies. Resolving issues related to property rights were at the forefront of that effort. From 1994–2005, USAID’s support of establishing a system of private ownership brought incentives to intensify agricultural production on formerly collectivized land where new private owners took control. Defragmenting plots of farmland also brought numerous economies of scale for small farmers.

As countries in Africa and Latin America in the 1990s turned their attention to reversing the slump in agricultural productivity and boosting food security, they, too, recognized that property rights and access to land were barriers to growth. The Agency funded land tenure assessments in many countries, helping to identify where formal titling and registration systems needed to be developed and where informal systems rooted in local customs could be adapted to meet the needs of rural populations for tenure security.

In recent years, issues surrounding use and management of natural resources have emerged as people everywhere grapple with the limits of

sustainable resource use. With broad experience across many decades on these complex issues, USAID has emerged as the global leader in discussions about securing land, water and other property rights and access for those whose voices are seldom heard in international circles.

ACHIEVEMENTS

All of these activities share one common theme: USAID’s ability to work with local partners to develop solutions adapted to the situation yet capable of supporting agricultural growth and economic development objectives. In the area of USAID support for securing property rights and access, the following four achievements stand out.

I.1 LAYING THE FOUNDATION FOR LAND TENURE SECURITY THROUGH SYSTEMATIC LAND CERTIFICATION, TITLING AND REGISTRATION.

For the past several decades, USAID has supported programs in nearly 50 countries seeking to reduce land ownership problems. These projects have strengthened the institutions and legal frameworks that address property ownership, including land titling; training; land measurements and property registration; conflict resolution; and land markets. The impact of these improved capabilities can be measured by the millions of land titles issued to farmers and non-farmers.

In the early 1980s the USAID Land Title Project (PTT) in Honduras focused on helping small farmers, especially those growing coffee, obtain land titles. Over the period 1983–2001,

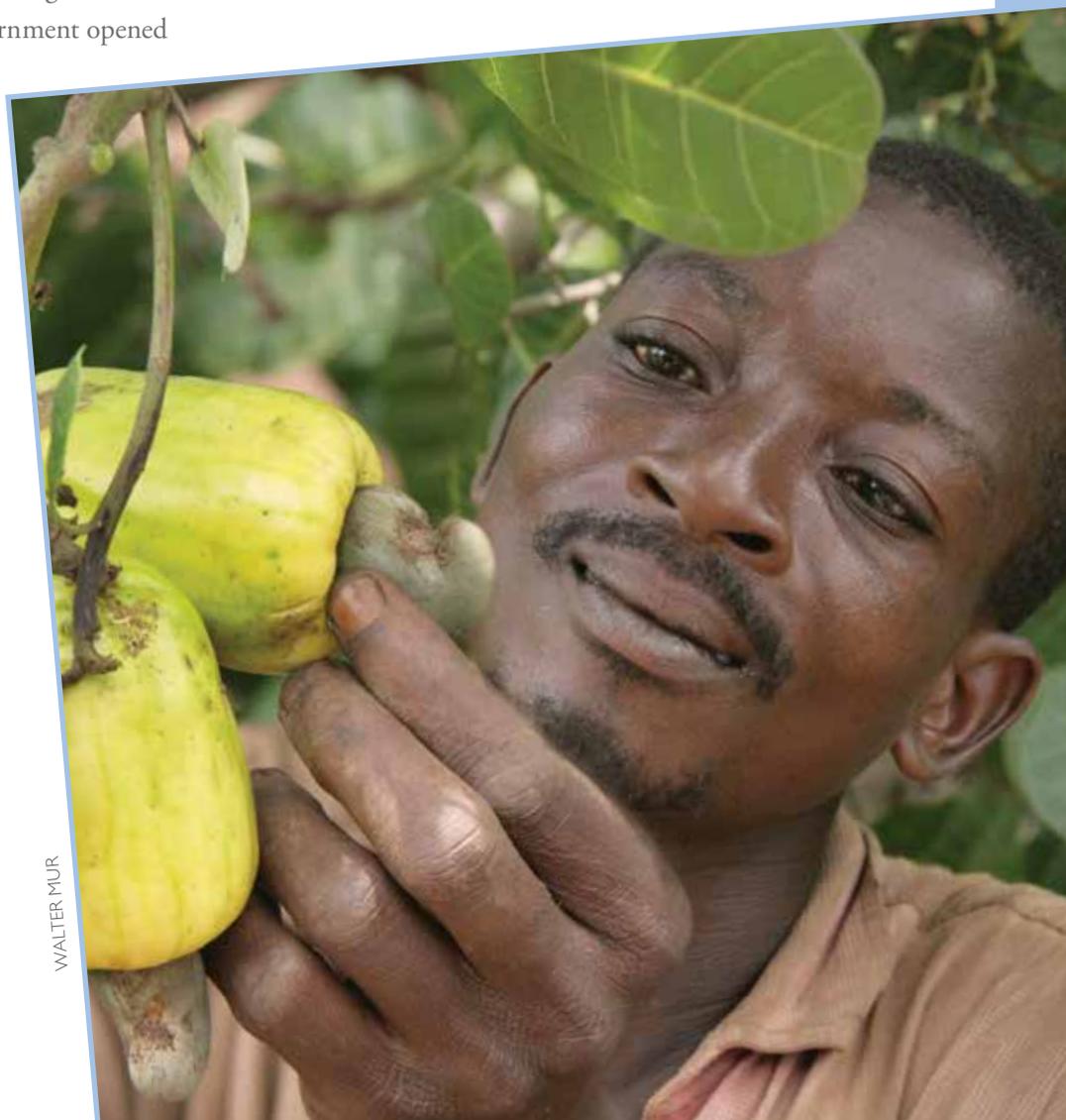
the agrarian reform agency provided over 150,000 titles to 2.86 million acres of land to small farmers. Impressive as that may seem, the real contribution of the PTT and subsequent projects came out of a USAID study that documented a significant increase in farm investments that occurred after land titles were given, and an even more significant increase in farmers' use of loans provided by credit unions, whose development was enhanced by another USAID project. Having a land title is one thing. Having access to a rural financial intermediary is another. Honduras is but one of numerous cases where USAID helped solve both sides of this equation—access to land and access to finance—while also illustrating the complexity of documenting benefits and costs of titling efforts.

In the 1960s, the Bolivian government opened the jungle Chaparé region for colonization and resettled Andes mountain dwellers there. In 2004, USAID launched a four-year project in the region to distribute land titles and develop procedures to be applied nationwide. Obtaining a land title at that point took an average of 36 months. By the project's end, the process took only six weeks and cost farmers far less than it had previously. Owners received titles to about 37,000 properties totaling some 500,000 hectares, or 90 percent of the Chaparé region. The land titling project built goodwill for the government, created a tax

base to pay for local projects, strengthened local institutions and freed up a larger portion of the region's capital base for legal enterprises.

USAID support for resettlement programs usually included infrastructure development (main roads and feeder roads, settlement pattern design, housing and wells), disease eradication (such as malaria) and complementary services, like those provided to other land settlement programs in Bolivia in the 1970s–80s (Chane-Piray and San Julian valleys) with “substantial and generally positive impacts,” according to a 1985 evaluation. USAID supported nine projects, including dams and irrigation systems, associated with Sri Lanka's Accelerated Mahaweli Development Program in the 1970s–90s.

Kwesi Kumah, farmer at Kuntunso near Techiman, inspecting cashew fruit. With agricultural support from USAID farmers in Ghana have improved their crop production efforts.



WALTER MUR

USAID's rapid response to Pakistan's 2010 floods ensured long-term food security for over 4 million individuals.



MEHDI ALI KHAN

1.2 ACCELERATING TRANSITIONS FROM CENTRALLY-PLANNED OWNERSHIP TO MARKET-ORIENTED OWNERSHIP.

After the collapse of the Soviet Union, many Eastern European countries found themselves in a state of economic and social disruption. Their agricultural sectors had been organized into huge collective farms and processing plants using equipment suitable for large-scale agriculture not easily broken into family-size farms. This made the transition to private markets difficult; many nations were starting at square one, without the experience or knowledge of how private markets worked or what was needed to promote them.

A notable example of this transition occurred in Albania. In the 40 years following the end of World War II, land ownership in Albania

underwent a major land policy shift and reversal. During the 1950s and 1960s, much of the farm land was consolidated into collective and state farms. Then starting in 1991, in the midst of economic turmoil, land in these large units was transferred back to private ownership.

This latter phase progressed quite rapidly, almost frantically. By the end of 2000, 1.7 million parcels of farm land had been transferred to private ownership. Part of this was driven by what was known, euphemistically, as “informal property development activity”—private individuals simply taking over parcels of land. In addition to land registration problems, this practice led to highly fragmented farmland, with the average farm family holding five parcels of land. The

district offices responsible for registering this land were poorly staffed and relied upon just a few rudimentary maps to identify parcels.

After considering various alternative methods of registering land, the Albanian government worked closely with USAID in the mid 1990s to establish a hybrid system that joined the mapping of parcels and the recording of legal rights for all land in Albania, state owned and private. This system, called the Immovable Property Registration System (IPRS), was implemented in a number of other countries, including Georgia and Moldova. IPRS and other institutional innovations strengthened land markets that were lacking in the former socialist countries.

Besides Albania, USAID's work in Kyrgyzstan, Georgia, Moldova and Ukraine produced similarly dramatic results. USAID helped accelerate the transition from communist economic systems to market-oriented systems emphasizing private land and property ownership, titling and registration and development of land markets. In the Ukraine, from 1999 to 2003 alone, USAID supported efforts resulting in the issuance of about 225,000 land titles. In Georgia, USAID support helped transfer to private ownership a total of 1.4 million parcels by 2008. In Kyrgyzstan, the Agency helped transfer ownership of 1 million parcels. As a result of USAID support, millions of people across the region today own their own homes, farms and other assets and, on the basis of this secure foundation of property rights, are actively building modern market-based economies and societies. USAID Missions are working with governments to facilitate post-transfer adjustments and develop

market institutions, with appropriate safeguards, for the long-term lease of land by those who do not want to farm to those who want to farm larger areas and take advantage of economies of scale.

In Ethiopia from 2005 to present, the reforms started under the Strengthening Ethiopia Land Tenure and Administration Project (ELTAP) in farming areas and Strengthening Ethiopia Land Administration Program in pastoral areas (ELAP) have collectively increased tenure security with the following positive impacts. Farmers who have received their land certificates report substantially less concern over losing their land, and have responded by taking longer-term production decisions, investing more in soil conservation and planting higher-value perennial crops, including timber. One study demonstrated that such measures resulted in a 45 percent increase in agricultural productivity. Other benefits include an enlarged area of intensive crop production rather than extensive production, improved land rental markets, enhanced gender equality in land tenure rights, and reduced land disputes. Combined with Ethiopian government and other donor interventions, these programs are helping to address problems of food security, economic growth, and instability. Notably, Ethiopia's traditionally poor and vulnerable are enjoying the greatest benefits.

1.3 DEVELOPING MORE EFFECTIVE TOOLS FOR SECURING LAND TENURE, PROPERTY RIGHTS AND ACCESS

Over the years, USAID applied a number of analytical techniques to develop local solutions to

land ownership and access issues. Recognizing the drawbacks of using different approaches, USAID designed a consistent set of tools—the Land Tenure and Property Rights Framework (LTPR)—to support land tenure and property rights programming. Specifically, these focus on LTPR assessments, impact evaluations, the local nuances of land tenure and property rights, and women/vulnerable groups, and post-conflict/stabilization. A database provides country-specific rankings, maps and assessment tools for 62 countries in which USAID operates. The LTPR framework is complemented by a process for programming that lays out a critical-path method for appropriate and efficient program design.

A complementary USAID-created tool, the Program Planning and Development MATRIX, provides categories of possible constraints and interventions involving land tenure and property rights. These constraints include violent conflict and post-conflict instability; unsustainable natural resource use and biodiversity loss; insecure tenure and property rights, inequitable access to land and natural resources, and poorly performing land markets. MATRIX also addresses cross-cutting interventions, such as public information and capacity building for communities that use customary or traditional systems of land and property rights.

The Ita Nia Rai, “Our Land,” program in East Timor mentioned at the beginning of this chapter provides an example of results obtained from applying the Land Tenure Property Rights Framework and MATRIX. Since 2007, USAID’s work with Timor-Leste’s Ministry of Justice

has collected approximately 23,000 claims to ownership of land across 10 of Timor-Leste’s 13 districts. As a result of USAID’s support, less than 10 percent of these claims ended in formal ownership disputes to be sorted out. This approach has reduced anxiety over land rights overall because ordinary people are seeing the process of land claims registration as transparent and without favoritism. Skepticism has given way to optimism as communities now demand that land claims registration start in their areas. In addition, District Administrations and local leaders are asking for the project to remain in areas under their jurisdiction and to expand into other localities.

USAID’s work with LTPR in Ethiopia began with an assessment in one region in 2004, expanded to four regions in 2005, and to six in 2008. ELTAP (2005–2008) developed and piloted fast and cost-effective methods of cadastral surveying using handheld GPS devices. Some 855 men and 269 women were then trained in land certification and cadastral surveying. These trained personnel demarcated land holdings and registered the rights of 146,824 households to 704,754 parcels of land with attached parcel index maps (PIMs). Land Administration and Use Proclamations harmonizing state law with federal law were passed in four regions. Courses on land law were delivered at federal and regional levels for 466 judges/officials and at the sub-district level for 592 land administration committee members. Courses on dispute resolution helped train 529 judges and officials. By February 2010 ELAP (2008–2013) had expanded to Ethiopia’s pastoral regions by surveying and registering with PIMs

an additional 52,300 parcels of land belonging to 40,880 households.

The Land Tenure Property Rights Framework and MATRIX fundamentally changed the way USAID approached land tenure and access issues by providing quantitative models that create a sense of order to an often chaotic process. USAID is applying these tools in conjunction with Millennium Challenge Corporation (MCC) projects across Africa, Central Asia, and Eastern Europe, as well as in Latin America and the Caribbean. This approach has become a global model for U.S. Government involvement.

I.4. EMPOWERING COMMUNITY BASED NATURAL RESOURCE MANAGEMENT

Rural populations have benefitted significantly in recent decades from USAID's investments in community based natural resources management (CBNRM). USAID project support to CBNRM was made possible in large part through Congressional earmarking of funds for biodiversity conservation, ranging from \$50–100 million per year in the 1990s to \$100–200 million per year in the 2000s. These CBNRM investments have increased local engagement in the improved management of natural resources such as soil and water, trees in cultivated fields, community forests, and wildlife and fisheries in ways that contributed to the sustainable use and increased productivity of these resources. The well-being of these rural producers has also been improved through the diversification of livelihoods and more opportunities to earn income, thereby contributing to the achievement of greater food security.

Major CBNRM programs were funded in Southern Africa with a focus on community-based management of wildlife, with particular success being achieved in Namibia. From a modest start in the early 1990s, the Conservancy program in Namibia has steadily expanded to include 240,000 people or 12 percent of the population of Namibia organized in 64 registered Conservancies managing 14 million hectares, or 17.6 percent of the country. Empowered local communities have taken advantage of supportive policies to increase their incomes from sustainable game meat harvesting, sales of live wildlife, wildlife trophy hunting and other benefits of wildlife-based tourism. Direct benefits for community participants amounted to \$5.05 million in 2009. As of May, 2011, the Conservancy program in Namibia had generated about \$28 million in cumulative economic benefits since the program was launched nearly 20 years ago. This steady increase in economic benefits for communities has been sustained well after the end of USAID project support, as a result of policy reforms and capacity building that triggered and enabled behavior changes in support of the conservation of the natural assets that form the foundation of the program's benefits.

Community forestry has been spectacularly successful in Nepal, where the mobilization and empowerment of community forest organizations has led to a remarkable transformation of rural landscapes across dozens of valleys where formerly degraded forests were more effectively protected, replanted and restored. More than 14,000 Community Forest User Groups (CFUGs)

have been organized, involving 35 percent of the total population of Nepal. The restored community forests managed by these groups now extend over more than 1 million hectares or 25 percent of the forested areas outside of Protected Areas. In 2008, the value of forest products harvested from community forests amounted to approximately \$28 million. The annual income from community forests to CFUGs from fines, fees and grants amounts to about \$12.8 million, or double the total annual revenue of the Department of Forests. Community forestry in Nepal and the development of associated community organizations have also prompted and enabled increased local investment in capital assets and community development activities such as improved drinking water supplies, school construction, training and informal education, and reduced vulnerability of the poor through access to savings and micro-credit. Worldwide, following the pioneering projects supported by USAID and others in Nepal and elsewhere, the growth in community forestry has been impressive and positively impacted the lives of tens of millions of forest-dependent people. Today, more than 400 million hectares or about 27 percent of the forests in developing countries are wholly or partly controlled locally.

Key policy reforms and support for grass roots innovations also contributed to widespread mobilization of rural producers in improved management of natural resources in agricultural landscapes across several West African countries. After recognizing the limitations of prior efforts focused on reforestation and establishment of plantations for firewood, support for more integrated and community based approaches gained momentum in the 1990s. In West Africa, CBNRM capitalized on the increased attention given to decentralization, community mobilization and capacity building among community-based organizations. CBNRM was also allied with support for good governance and policy reforms that made it possible for local producers to capture more economic benefits from CBNRM and secured resource tenure so as to enable local

“The steady increases in the density of trees on farms over the past 20 years has in turn generated a range of significant benefits for 4.5 million people in terms of increased production of food, firewood, fodder and other products, increased income and food security, and adaptation to climate change.”

communities to have more management authority over natural resources.

In Niger, the clarification of land tenure through the reformed Rural Code, along with the reform of the Forest Code and strengthening of local rights to harvest products from trees on farms, played a catalytic role in stimulating local investment in improved soil and water conservation techniques and in the protection of natural regeneration of trees and shrubs in farm fields. Pioneering studies supported by USAID revealed that this technique of “farmer-managed natural regeneration” (FMNR) was being practiced on more than 5 million hectares or about 40 percent of the arable land of Niger. This represented an investment equivalent to planting some 200 million trees. The steady increases in the density of trees on farms over the past 20 years has generated a range of significant benefits for 4.5 million people in terms of increased production of food, firewood, fodder and other products; increased income and food security; and adaptation to climate change. For example, recent data show a strong positive correlation between increased tree density in fields and increased production of cereal grains as a result of the beneficial influences on reducing wind and water erosion and improved soil fertility. As a result of efforts to protect and manage the regeneration of trees and shrubs in and around cultivated fields, farmers in Niger have produced an estimated additional 500,000 tons of cereals each year, equivalent to the annual requirements for 2.5 million people out of a total population of about 15 million. FMNR also contributes to

food security through the income from the sale of firewood, fodder, edible fruits and leaves and other tree crops in local markets.

USAID-funded Community based management of wetlands and inland capture fisheries achieved notable success in Bangladesh, where tens of thousands of rural producers joined rural organizations committed to the protection of fish sanctuaries, local enforcement of destructive fishing practices and adoption of more sustainable fisheries and wetland management practices. Community-led co-management committees have virtually stopped illegal logging in five protected forest areas. In the Philippines, USAID supported an ecosystems approach to fisheries management that reversed a long-term decline in fisheries stocks by bringing over 77,000 ha of marine waters under improved management with a three-fold increase in productivity and a 76 percent increase in total fisheries harvests.

Another example of USAID unlocking underutilized resources through securing property rights is the Property Rights and Artisanal Diamond Development (PRADD) project. Started in 2007 in Central African Republic, it aims to increase the amount of alluvial diamonds entering the formal chain of custody, while improving the benefits accruing to mining communities through strengthening property rights. Being able to identify who owns the land on which a diamond is found, and making the right of artisanal miners to prospect and dig for diamonds more formal and secure, creates incentives for more miners to enter their production into the formal chain of custody, and will enable countries to track larger

portions of diamonds from the point of extraction to market. Replication of the PRADD model in Liberia began in mid-2010, with other countries in Africa in line to do so.

CONCLUSIONS

Marciana Soares' story in Timor-Leste, told above, is one of millions of examples of USAID's work to catalyze opportunity and stability through land tenure, land markets and property rights.

USAID's involvement in land tenure and property rights issues has enabled the Agency to play a role in international policy- and decision-making. A USAID representative chairs a UN committee that seeks to reconcile alternative voluntary guidelines on responsible agricultural investment in land as a way to protect all interests in the so-called "land-grab" issues. USAID's experience on land and property rights informs U.S. government negotiations on these issues in programs not implemented by USAID.

Despite the complex, multifaceted nature of land tenure reform, USAID's efforts to help nations achieve success have been instrumental in facilitating the transformation of agriculture and the lives of those engaged in its practice. Over the long term, land tenure and property rights are arguably the most important catalysts to driving economic growth and improving living conditions in rural regions.

While much progress has been achieved, USAID and its partners could have done more to extend success in one country to others. For example, USAID pioneered community forestry in Nepal, natural forest management in West Africa

and CBNRM in Southern Africa, but the lessons have not been fully applied in the Congo basin and elsewhere in Asia and Latin America.

Improved management of fisheries, wildlife and perennial crops in rural production systems due to community-based management have proved to be valuable and significant sources of additional income and contributed to better nutrition and food security. Yet, their potential is often overlooked in agricultural sector programming.

LESSONS LEARNED

1. **Clear and effective property rights can formalize and harness the huge assets held by the poor and unleash private capital that can create enough wealth to make domestic capitalism work in urban as well as rural areas.**
2. **Land tenure security motivates producers to invest in productivity-increasing technologies and land improvements because they can expect to capture the full returns of these investments.** Secure land rights are a foundation of market economies. This includes the right to buy, sell, rent and inherit land, all requisite options for long-term planning. With secure land tenure, land values will reflect their most productive economic use, signaling options for rational growth.
3. **When small farmers have secured ownership rights and access to private property, new doors are open to a world of opportunity for more profitable use of resources.** These farmers often invest more in efforts to improve productivity, such as conserving soil, terracing or irrigating their lands, and planting

perennial crops. They may lease lands to other farmers, which diversifies their livelihoods, and in some cases they may be better able to access financial services or receive payments for carbon sequestration. On the national level, the aggregate impact of individual-ownership rights have helped brighten prospects for broad-based economic growth.

4. **The benefits of land rights extend beyond economic growth. Land tenure security promotes conservation of natural resources and maintains biodiversity.** Clarity and confidence in property ownership and rights can help alleviate poverty, improve food security, prevent conflicts, mitigate impacts of climate change, and improve people's health.
5. **Reforming a country's land tenure and property rights scheme is a long, complex process.** It is long because untangling the existing web of laws and, often, corruption—and replacing them with a widely-accepted private property system—takes decades. It is complex because a thriving agricultural economy requires many elements all working effectively: In addition to recognition of secure property titles, reforms require a functioning land market for sales and rentals, peace and security, access to reliable financial services, and dependable markets for agricultural inputs and outputs.
6. **Land tenure reforms must also take the political economy into account. Those with a stake in blocking land tenure security will resist reforms, often fiercely.** Conceptual frameworks that argue for reform in the interest of equity and opportunities for inclusive growth are rarely sufficient to convince those focused solely on self-interest.
7. **Land tenure reforms have been carried out most successfully when a compelling urgency for reforms exists, such as following war or other major calamity.** These urgent conditions are often short-lived. The progress of transformation lurches forward in fits and starts. Achievements are often measured in uneven increments.
8. **Where they perform well, informal or customary systems may offer effective land tenure security.** It is advisable to document and legally recognize all forms of land rights. When deciding precedence between statutory and customary rights, procedures need to be spelled out to ensure transparency and due process, especially for “traditional” groups who are at disadvantage in a formal legal setting.
9. **New land settlement schemes often require investments in site selection and planning, as well as supporting infrastructure and a mix of economic and social services.** Agricultural settlers will need access to reliable markets for them to grow food staples and high-value licit crops.



PHOTO COURTESY OF CGIAR (ITA GENE BANK)

TWO

Mobilizing Science and Technology

DEVELOPING RESEARCH CAPACITY, TOOLS AND TECHNIQUES TO INCREASE THE PRODUCTIVITY, SUSTAINABILITY AND RESILIENCE OF AGRICULTURAL SYSTEMS

Overcoming complex and persistent problems— such as dire food shortages—usually requires a coordinated offensive on many fronts using multiple approaches. Sometimes, one approach—in this case, mobilizing science and technology—can lead the way and catalyze game-changing improvements.

India's long history is punctuated by recurring famines. The monsoon rains were lighter than usual in 1965, and again in 1966, leading to a 23 percent drop in paddy rice production in both years below the 1964 level. Massive imports of U.S. food aid helped to avert food scarcities and starvation. But this time was different. In the mid-1960s a revolution was breaking out—a revolution in food science and technology that would avert widespread famine, save millions of lives, and ultimately feed an extra billion people.

The “Green Revolution,” a term coined by former USAID Administrator, William Gaud, and led by the work of Norman Borlaug and other crop scientists, produced the most dramatic increase in food production in human history. Borlaug's work, supported by USAID, the Rockefeller Foundation, the Ford Foundation and other donors, improved farm productivity by developing high-yielding cereal varieties that responded well to fertilizer and irrigation, tolerated stresses, and could be grown by farmers at any scale.

The Green Revolution, and subsequent breakthroughs, demonstrate the vital importance of science and technology to agricultural development. In Mexico, where Borlaug did his first experiments, use of high-yielding wheat varieties increased wheat production by six times between 1944 and 1963. Within twenty years, India's rice production would increase by almost 50 percent between 1961, before the Green Revolution, and 1981. All the more impressive, India's wheat production jumped 230 percent. Many other countries experienced similarly stunning growth in maize, rice and wheat yields and harvests. Overall, between 1961 and 2007, world rice production increased 302 percent, maize 386 percent and wheat 273 percent, far outstripping population growth. Over the same period, those suffering from hunger and poverty fell

AT LEFT: scientist tracking stock of in-vitro yams at the International Institute of Tropical Agriculture in Ibadan, Nigeria.

WHY SCIENCE & TECHNOLOGY?

Agricultural science and technology matter a lot to developing countries because they can help jump-start farm production and economic growth. Science and technology research helps to maintain the gains already achieved. Sharing research results keeps countries abreast of changes that might affect crops, helping farmers adapt to threats from insects, diseases and weeds, soil quality, rainfall patterns and extreme weather. Such research also helps farmers in developing countries to continually adjust their knowledge and practices to economic, market and social forces.

Current research on climate change and measures to protect against the yield-reducing effects of higher temperatures, for example, may well determine the location, viability and economics of certain cropping patterns and help drive the development of temperature-resilient varieties.

sharply in both absolute and relative terms as a result of more abundant and affordable food and new job opportunities.

While the benefits are astounding, the Green Revolution has had its critics. The early beneficiaries were the larger and wealthier farmers; small farmers were slower to adopt Green Revolution technologies. It is now understood that the conditions under

which yield-enhancing technologies benefit smallholders as well as large farmers include development of scale-neutral technologies; equitable distribution of land and secure access; access to farm credit, inputs and information; and policies that do not discriminate against small farmers and the landless. Environmental criticisms, including excessive and inappropriate use of fertilizers and pesticides; over-irrigation and drawdown of water tables; and loss of biodiversity, are now recognized and slowly being corrected by policy reforms, better technologies and management practices, and greater crop diversification. Higher yields through crop intensification, moreover, have dramatically slowed the destruction of forested land and expansion of crop land. The question remains: What would have been the scale of hunger and poverty without the productivity increases of the Green Revolution?

Across fifty years of service, USAID—in partnership with donors, USDA and university scientists and host country researchers—has boosted agricultural productivity across the globe, helping to feed the world’s growing population and ease global poverty. Through these partnerships, USAID has mobilized science and technology research to develop methods that are economically and environmentally sound. Much of USAID’s success has come from the commitment to assemble and support teams that brought together both U.S. and host country scientists to find country-specific solutions.

The benefits of USAID’s work to spread agricultural science and technology across the world can also be seen in farms in the United States, sometimes called the “duality of benefit.”

An estimated 60 percent of sorghum hybrids in the United States have at least one parent from USAID-funded research abroad. USAID-supported international variety research activities developed germplasm that contributed an estimated \$680 million to U.S. grain sorghum production in 2005. About 65 percent of the U.S. rice crop stems from rice research in The Philippines, partially funded by USAID. Such investments are highly profitable.

A 2003 assessment of 11 USAID-funded crop breeding programs found that without the improved varieties from these programs, developing countries likely would have seen yields as much as 23 percent lower. Prices for all crops combined would have increased by as much as 66 percent. Caloric intake per capita would have dropped by more than 13 percent. In short, global prosperity and food security has been demonstrably and significantly improved by USAID's contributions to agricultural science and technology.

ACHIEVEMENTS

Agricultural research doesn't produce breakthroughs overnight. Sustained progress built on the result of earlier research in the 1930s, 1940s and 1950s to develop higher-yielding hybrid varieties—wheat varieties that resisted stem rust, shorter-stalk rice varieties that didn't fall over before harvesting and improved maize hybrids, as well as higher-yielding and more nutritious beans. Concurrently, USAID promoted better conservation and management of natural resources as complementary practices to boost yields and output.

Women in South Korea harvest high-yielding rice varieties in the early years of the Green Revolution. South Korea "graduated" from USAID assistance in 1980.

USAID has recognized that the private sector may be reluctant to invest in agricultural science and technology when success is uncertain and profitability not guaranteed. Science involves discovery—with one idea or discovery leading to the next. Translating that discovery into applicable technologies requires product development, extensive experimentation, and packaging for delivery.

This makes public sector funding crucial for underwriting those costs of research whose results are available to all as public goods. With this in mind, USAID continues to help partner countries and regional organizations formulate policies and strategies that embrace science and technology, expand public-private sector partnerships, and build collaborative networks of specialists. As part of that process, USAID has long recognized the critical role of women in agriculture and, as a matter of policy and practice, seeks to recognize and expand the numbers of women in agricultural science and technology.

Over the past half-century, USAID has been a leader in supporting the spread of agricultural science and technology with a long-term view. Several achievements stand out.



USAID ARCHIVES

2.1 ENLISTING U.S. SCIENCE AND TECHNOLOGY EXPERTISE TO ADDRESS AGRICULTURE'S LONGSTANDING CHALLENGES

The success of agriculture in the United States is built on science and technology and rests on a foundation laid by “land-grant” universities and colleges. In 1862, the U.S. Congress established colleges and universities in each state to teach agricultural and technical courses. Each institution received a grant of federal land for field trials and demonstrations. Other laws later established agricultural experiment stations and cooperative extension services to provide technical advice and other services to farmers. Since then, science and technology research at land-grant institutions around the country has focused on developing technologies and practices most beneficial to the unique characteristics of each state and region.

When USAID sought a model for developing agricultural technologies to export around the world, these existing land-grant universities were a natural fit. By linking the expertise of land-grant universities with the needs of developing countries, sometimes with similar agro-ecological conditions, USAID maximized the effectiveness of each partnership. In its first full year in 1962, USAID paired American universities with universities in Brazil, India, Kenya, Peru, the Philippines, Tanzania and Tunisia.

Two of the most successful examples of the Agency's efforts to mobilize U.S. science and technology expertise to address the problems facing developing country agriculture are the Collaborative Research Support Programs and biotechnology applications.

Collaborative Research Support Programs

Authorized by Title XII, Famine Prevention and Freedom from Hunger, of the International Development and Food Assistance Act of 1975, the Collaborative Research Support Programs (CRSPs, now called Innovation Labs) are long-term, multi-disciplinary research and affiliations of scientists from U.S. universities with their counterparts in developing country universities, national and international agricultural research centers, the private sector, and nongovernmental organizations.

CRSPs, which emphasize the importance of partnerships in finding country-led solutions to world hunger, include research programs in livestock and climate change, horticulture, nutrition, peanuts and dry grain pulses. Two CRSPs in particular illustrate the benefits of these purpose-driven research programs.

The International Sorghum and Millet CRSP (INTSORMIL) combines the expertise of scientists representing at least nine agricultural disciplines with participation from universities



RODION GUDIM

Moldovan dried fruit and vegetable producers observe a Uniferax-Grup washing machine during a study tour. These machines have met Western standards, giving firms a chance to now enter new markets.

in five U.S. states and the U.S. Department of Agriculture's Agricultural Research Service. These scientists and related institutions collaborate with the International Crop Research Institute for the Semi-Arid Tropics (ICRISAT), other international agricultural research centers (IARCs), and the National Agricultural Research Systems (NARSs) in 18 African and Central American countries to work on sorghum, along with millet and other small grains. Sorghum is a food staple in certain agro-ecological zones in Africa, Central/South America and Asia.

This collaboration developed more than 30 stress-tolerant and high-yielding sorghum varieties and soil-management best practices that increased sorghum yield on farm fields by up to 50 percent. INTSORMIL's calculated economic benefit has reached almost \$10 for every \$1 spent on research and development. Introduction of these technologies and farmer training significantly increased yields in Senegal, Mali, Niger and Burkina Faso, countries that experienced devastating drought and hunger in the early 1970s. Sorghum producers are developing new markets to supply the expanding poultry feed business as feed mixers look to locally grown sorghum as a cost-competitive and safer (fewer mycotoxin problems) substitute for maize.

Gebisa Ejeta, an INTSORMIL scientist from Ethiopia, who received his graduate training in the United States with USAID support, won the 2009 World Food Prize for discovering the way the parasitic weed, *striga*, attacks sorghum and related varieties. He also developed sorghum varieties that can withstand both *striga* and drought, a frequent and sometimes devastating occurrence in Africa.

The INTSORMIL program has also trained and awarded MSc and Ph.D. degrees to more than 1,000 U.S. and foreign national scientists. These scientists are now actively involved in sorghum and millet technology development and transfer programs in the United States and in developing countries to take on the continuing challenges and opportunities that these coarse grains face.

Another example, the Sustainable Agriculture and Natural Resources Management (SANREM) CRSP is a partnership of 17 universities and several International Agricultural Research Centers to develop knowledge and tools that promote environmentally sustainable agriculture and natural resource management. Started in 1992, SANREM's multidisciplinary research program involves stakeholders at all levels and emphasizes gender and marginal group equity, environmentally sustainable development, and improved livelihoods through increased agricultural productivity and the restoration of degraded agricultural soils.

Recent long-term research activities have focused on how policy reforms change property rights and outcomes for people and the environment; monitoring the social, economic and environmental effects of watershed-based natural resource management on small-scale agriculture in Ecuador and Bolivia; exploring ways of adapting to economic and environmental change and building resilient livelihood systems; and developing economically viable and ecologically sound vegetable-agroforestry systems and quantifying their potential economic and environmental benefits. SANREM research

spearheaded breakthrough work that examined how alternative forest management policies and governance in developing countries affect the livelihoods of local forest users and forest protection. This research found that common property is often well-managed by the people who can control its use (Chapter 9).

The evolution of the CRSPs is itself part of the story. Each CRSP started out with a relatively narrow commodity or animal focus (such as sorghum and millet, beans and cowpeas, small ruminants, and fish farming and pond dynamics). In the early phase, TropSoils (1981–93) was the only CRSP with a broader landscape-level focus. SANREM (1992–present), based on a holistic view of agricultural production systems, continued this shift away from commodity-focused research. Social science-oriented research on poverty, inequality and development as related to agriculture expanded to the Broadening Access and Strengthening Input market Systems (BASIS) CRSP (1995–2006), renamed as the BASIS-Assets and Market Access CRSP (2006–present). Following a major review and extensive public consultation on agriculture and natural resources management research priorities in 2005, thirty years after the legislation launching the CRSPs, the CRSPs have strived to take a systems-oriented approach in their research, addressing such themes as policies, institutions, market development, income-diversification and gender inclusion. Reflecting new priorities, a Horticulture CRSP was launched in 2009 and a Nutrition CRSP in 2010. As this document goes to publication, USAID is reviewing the recommendations of a BIFAD-commissioned review of the CRSP model.

Biotechnology Applications

Biotechnology is broadly defined as the use of science and technology to improve the genetic characteristics of plants and animals, and can include techniques to speed up conventional plant/animal breeding, techniques to induce random genetic mutation, and techniques to induce targeted genetic modifications. Thus, biotechnology may entail “a range of different molecular technologies such as gene manipulation and gene transfer, DNA typing and cloning of plants and animals” (FAO) that improve a plant’s quality, productivity and resistance to pests, diseases and drought. Working with others over many years, USAID used biotechnology to help eradicate rinderpest, a deadly viral disease in cattle and buffalo in Africa (pages 42–43).

Since 1989, USAID has taken an innovative approach to biotechnology, integrating training and technological development with policy reforms that are necessary for safe and effective application in developing countries. This approach ensures that countries can safely use biotechnology as a tool for research if they choose, that a broader range of technologies is available to benefit small-scale farmers by building technical capacity in crop research and development, and that decision makers have the resources they need to make informed choices about biotechnology and biosafety.

As one example, the Bt (*Bacillus thuringiensis*) eggplant is genetically modified to resist fruit and shoot borers that can reduce yields by 50 percent and thereby reduce heavy insecticide use to control infestations. In addition to Bt eggplant, other programs in Bangladesh, India, the Philippines

USAID teamed up with Catholic Relief Services and the Food and Agriculture Organization in Burundi to search for cassava varieties that resist the cassava mosaic leaf virus.

PHILIP STEFFEN



and Uganda focus on improving bananas, cotton, groundnuts, papaya, potatoes, tomatoes and rice.

Science and its technological applications go hand in hand. Through programs like the Collaborative Agribusiness Support Program (CASP) clustering the long-established competencies of four U.S. land grant universities (1993–98), the Agency supported technical assistance, training, and technology research needs for its agricultural projects around the world in seed production and storage; postharvest handling of perishable food commodities; storage of food and feed grains; and expanded use of soybeans, and legumes. Among other achievements, the Postharvest Institute for Perishables at the University of Idaho collaborated with the Inter-American Institute for Cooperation on Agriculture (IICA) and the Association of Southeast Asian Nations (ASEAN) Food Handling Bureau to produce a “Commodity Systems Assessment Methodology for Problem and Project Identification” (CSAM) in 1999. This 26-step training tool, designed to assist agricultural professionals pinpoint food systems problems and formulate solutions, is applicable for the production, postharvest handling and marketing of any given commodity. The CSAM, still in use, has broad relevance for the technology side of value chain development and upgrading; analysis of biological, chemical, and physical hazards for food safety; and general commodity subsector analysis.

2.2 INAUGURATING AND CO-FUNDING FUNDING THE CONSULTATIVE GROUP FOR INTERNATIONAL AGRICULTURAL RESEARCH.

Problems that transcend national borders often can be addressed more efficiently and at lower cost on a regional basis than a country-by-country approach. Recognizing this, in 1969 USAID began funding the International Center for Improvement of Maize and Wheat Production, CIMMYT, in Mexico (founded in 1966, an expansion of the Rockefeller Foundation’s Agricultural Program started in 1944 that had received previous U.S. Government funding). Within a year, USAID started funding three other international agricultural research centers founded with financial support from the Ford and Rockefeller Foundations: the International Rice Research Institute, IRRI, in The Philippines (founded in 1960), the International Center for Tropical Agriculture, CIAT, in Colombia (1967), and the International Institute of Tropical Agriculture, IITA, in Nigeria (1967).

In 1971, USAID joined with other major foreign assistance donors to form the Consultative Group on International Agricultural Research (CGIAR) around IRRI, CIMMYT, CIAT and IITA. The USAID Administrator, John Hannah, promised to fund 25 percent of the CGIAR’s costs, a level maintained for many years. As a founding member, USAID has been active in providing direction and oversight, and has been the largest

financial donor to the CGIAR, providing more than \$1.4 billion to date.

The CGIAR is a strategic partnership that conducts research and promotes technology transfer aimed at achieving food security and reducing poverty in developing countries. The number of the original international agricultural research centers (IARCs) has expanded from 4 to 15, embracing other commodities such as roots and tubers, food legumes and oil crops, non-plant agriculture such as livestock and fisheries, other production systems such as agro-forestry and semi-arid land and dry land agriculture, insect pests and related diseases, water resources, and agricultural policies and economics. The IARCs collaborate closely with national and regional research institutes, civil society organizations, academia, and the private sector. Research focuses on boosting sustainable production and incomes; sustaining biodiversity; improving natural resource management; addressing the impacts of climate change on food security, and developing policies to reduce poverty and hunger.

The IARCs have been instrumental in the collection and maintenance of germplasm (the genetic resources of a seed), basic genetic improvement of plants and animals, and information exchange. The IARCs, especially CIMMYT and IRRI, established a pattern early on for greater cooperation in agricultural research between international and national research centers. The IARCs conduct research in developing countries under conditions that local people face. Another early innovation was shuttle breeding to speed the development of new plant varieties; plants were “shuttled” between different locations

to take advantage of two growing seasons per year, cutting the time to develop new varieties in half.

Other far-reaching impacts included crop genetic improvements, such as drought-tolerant maize and flood-tolerant rice; natural resources management and conservation, such as biological control of the cassava mealybug and green mite and resource-conserving “zero-till” technology; and food policy research, such as pro-poor policy and institutional reforms.

Several years ago, independent analysts estimated that without CGIAR contributions:

- » World food production would be 4–5 percent lower, and developing countries would produce 7–8 percent less.
- » World grain prices would be 18–21 percent higher, adversely affecting poor consumers in particular.
- » Cultivated areas in developing countries would be 11–13 million hectares larger, expanding at the expense of primary forests and marginal lands that are fragile and harbor high biodiversity.
- » Per capita food consumption in developing countries would be 5 percent lower on average and as much as 7 percent lower in the poorest regions.
- » Some 13–15 million more children would be malnourished, most of them in South Asia, where the incidence of hunger is highest.

USAID has played an active role helping the CGIAR adopt a new institutional model to reduce duplication by defining critical research themes across multiple centers to improve delivery of

research results, clarify lines of accountability, and streamline governance and programs.

2.3 BUILDING AND STRENGTHENING NATIONAL AGRICULTURAL RESEARCH SYSTEMS (NARS) AND PRODUCTION PROGRAMS IN DEVELOPING COUNTRIES.

In keeping with USAID’s goal of creating the necessary conditions for sustainable progress, the

Agency invests in building National Agricultural Research Systems (NARSs) and production programs in partner countries. National agricultural research systems enable these countries, through science, to understand the potential of and challenges to local agricultural production and to develop technologies that enable producers to improve their outcomes and meet consumer needs.

GLOBAL HUNGER INDEX

These organizations, the International Food Policy and Research Institute (IFPRI), Welthungerhilfe and Concern Worldwide, publish an annual Global Hunger Index, which illustrates the remarkable success that many of USAID’s partner countries have enjoyed in reducing hunger. While many factors contributed to this success, USAID-supported advances in agricultural science and technology helped to accelerate progress.

GLOBAL HUNGER INDEX SCORES

	1980	2010
BANGLADESH	44.4	24.2
INDIA	41.2	24.1
INDONESIA	28.1	13.2
PAKISTAN	33.6	19.1
PHILIPPINES	22.4	13.0
THAILAND	23.3	8.5

The GHI scores countries on an open-ended scale, based on the proportion of people who are undernourished; the proportion of children under five who are underweight, and the child mortality rate. Scores above 40 are considered “disastrous;” those above 30 are “very alarming;” those above 20 are “alarming;” and those above 10 are “serious.” A decrease in the score indicates fewer hungry and malnourished people.

A NARS consists of public agricultural research institutes, universities and other auxiliary institutions, farmer groups, civil society organizations, private sector and any other entities that conduct agricultural research. The NARS institutional framework encompasses public as well as private sector institutions in implementing agricultural research and promoting linkages with other national, regional and international institutions. USAID seeks to help a NARS transform agricultural production into modern science-based, market-oriented agriculture capable of greater efficiency, profitability and of sustaining growth in the agricultural sector while contributing to poverty eradication.

Adapting the results of agricultural research to local conditions and technologies often takes considerable time and funding before a breakthrough is reached. USAID recognized that building and strengthening NARSs and production programs in developing countries is key to a developing country's ability to effectively borrow agricultural science and technology from international agricultural research centers, adapt it to local conditions and share it. NARSs need to be able to identify, screen and adopt suitable applications of research to local conditions and technologies. Successfully achieving a wide-scale impact may take decades—even in countries that are highly committed to developing strong agricultural national research capabilities. And as most basic agricultural research is an essential public good—in the absence of intellectual property rights, available to all—the traditional public sector focus on basic and applied research

in food staples, other food crops and related food safety issues necessarily falls to the NARSs. USAID's support has proved indispensable.

For example, USAID has worked closely with Brazil to build its internal research capacity. This partnership began in 1953, when USAID's predecessor organization provided support for institution-building and extension programs at the Federal University at Vicosa and later developed partnerships with four Brazilian agricultural universities, emphasizing undergraduate training and graduate training in Brazilian and U.S. universities. USAID provided early technical assistance for EMBRAPA, the Brazilian Agricultural Research Corporation. The public company, established in 1973, is widely recognized as the key actor in Brazil's agricultural progress. The first cadre of EMBRAPA's scientific staff was trained in the United States with USAID support. From 1996 to 2006, the total value of Brazil's crops increased 365 percent. Brazil now leads the world in exports of beef, poultry, sugar cane and ethanol.

Today, Brazil has a world-class agricultural research system that has diversified into agribusiness and food technology, biotechnology and genetics, floriculture and forestry, remote sensing, livestock production, and technology transfer and social development. EMBRAPA has on-going agricultural innovation partnerships in Africa and is entering into similar partnerships in Latin America and the Caribbean. EMBRAPA's capability powerfully demonstrates the energy embedded in agricultural science and technology to get a country moving.

In Asia, USAID made major investments in 14 countries and institutions into the 1990s. During Asia's Green Revolution, USAID was a major facilitator of partnerships between U.S. foundations and Indian research and educational institutions. USAID provided technical advice in agricultural production, seed production, soil and water management, and other areas. From 1956 to 1970, USAID and its predecessors brought a total of 2,000 Indian scientists to the United States for advanced education in agriculture and natural resources management. Partly as a result of USAID's technical assistance and support for Indian universities, India ranks fourth in the world in total investments in public agricultural research and development. More than half of Indian agricultural research staffers hold Ph.D. degrees, one of the highest rates in the developing world.

In Indonesia, USAID partnered with the World Bank, the Asian Development Bank, the U.N. Development Program, the Australian Centre on Agricultural Research, AusAID, Japan International Cooperation Agency (JICA), and others. The Agency supported development of Indonesia's leading agricultural university, reorganization of its NARS and the development of Indonesia's Agency for Agricultural Research and Development. USAID also provided technical assistance, infrastructure building and training across the country's vast archipelago.

The Agency made similar contributions to building agricultural research capacities in the Philippines, Pakistan, Bangladesh and Thailand.

In Sub-Saharan Africa, USAID's support for the NARSs began in the 1960s and continues

today. The Agency currently supports about 175 projects in more than 30 Sub-Saharan countries with research-related funding. USAID made early significant investments in faculties of agriculture and overseas training to build a critical mass of trained people to carry out research. But there is still more work to be done. African agricultural research remains unevenly developed with about 40 percent of total research capacity concentrated in five of the continent's 54 countries.

Positive impacts of USAID-supported science and technology continue. In Kenya, USAID's research support for the NARS began in 1964, aiming to develop a breeding methodology for regular improvements in hybrid maize and to create institutional capacity in East Africa for maize research. By 1977, most smallholder farmers in the Central, Rift Valley and Western Provinces were successfully growing hybrid maize. Support for long-term training, both locally and internationally, has continued, especially locally through the Kenya Agricultural Biotechnology Support Program implemented by the Kenyan Agricultural Research Institution (KARI). KARI is recognized throughout East Africa as a premier



USAID/EGYPT

Tube green house technology allows farmers in Egypt to grow capsicum in the off-season.

research institute whose maize varieties are marketed over the region.

In the Near East and North Africa, USAID agricultural research support focused on Egypt, which has achieved some of the world's highest yields on limited land, and on Morocco, which is making a transition from grains-based agriculture to higher-value crops. In addition, USAID supports projects with research-related funding in six other countries—Jordan, Oman, Syria, Tunisia, Turkey, and Yemen.

USAID sponsors additional research through the Middle East Regional Cooperation (MERC) Program, a USAID-managed, peer-reviewed, competitive research grants program specifically focused on promoting technical cooperation between Arab and Israeli scientists, students and communities. The bulk of the research grants fall within agriculture, environment, or health.

CONCLUSIONS

Over the past half-century, investments in science and technology have proven to be among the world's most socially and economically profitable. The World Bank's 2008 *World Development Report* concluded that research and development has turned much of developing world agriculture into a dynamic sector, characterized by rapid technological innovation that is accelerating growth and reducing poverty in many parts of the world. The *Report* further concludes that analysis of some 700 agricultural research and development and extension investments in the developing world averaged an astounding 43 percent annual rate of return. Rates of return are high in all regions,

including Sub-Saharan Africa, the *Report* says. It is clear that the most effective way to raise incomes is to raise the productivity of agricultural resources on which rural poor people depend, their land and labor.

At a time of global economic uncertainty, with governments across the globe looking to spend limited resources on initiatives that positively impact the greatest number of people while offering high value for the money, agricultural research and technology is an obvious target for increased investment.

Clearly, not all research investments are successful and not all science and technology investments were driven by USAID. However, many were directly or indirectly funded by USAID—and many of the researchers and those carrying out these projects were trained in the United States.

The effort to mobilize U.S. science and technology to tackle problems in developing countries has achieved considerable incremental progress that amounts to significant impacts over time, such as lower Global Hunger Indices. Another telling indicator is that cereal production in Asia doubled between 1975 and 1995, ahead of population growth, and poverty fell sharply in both absolute and relative terms as a result of scientific breakthroughs and improved practices that have yielded more abundant and affordable food and new job opportunities while raising farm household incomes. Mobilizing science and technology has proven beneficial to developing countries and the United States. However, research requires continuous effort just to maintain the progress already achieved and to

meet the challenge of feeding the world's growing populations while ensuring social, economic and environmental sustainability.

This chapter is too short to highlight the many other examples where USAID has mobilized science and technology to achieve impact and transform agricultural systems. In addition to the stories on crop research and breeding using traditional and biotechnological methods, USAID investments have enhanced soil fertility and conservation; improved pasture management; popularized animal traction and increased the productivity of small and large ruminants; expanded water resources management through irrigation pumping technologies and water users associations; promoted national, regional and river-basin planning in Africa and Asia; developed regional agro-meteorological institutions; and pioneered remote sensing for a host of applications, including famine and livestock early warning, eco-friendly agriculture and climate change adaptation. The Agency is always looking for new applications of science and technology for agricultural systems.

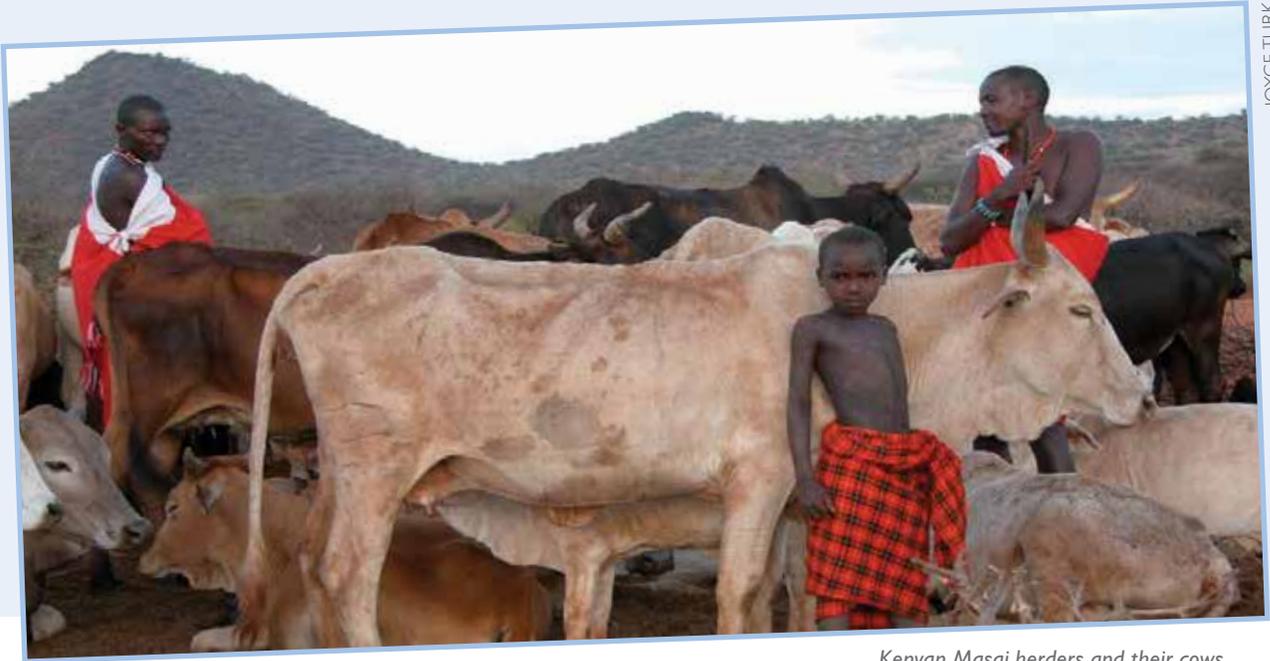
LESSONS LEARNED

1. **Evidence shows that science and technology have a critical role in helping developing countries overcome constraints to agricultural production and productivity.**
2. **Harnessing science and technology is a proven gamechanger for improving a country's agricultural productivity, accelerating economic growth, raising incomes and lowering poverty.**
3. **The public sector has a clear and compelling role in carrying out agricultural research that the private sector can enhance and apply.**
4. **Just a few highly trained and motivated people can make a big difference when ideas and inspiration are matched with the right tools, funding and opportunities.** The challenge is to find and nurture these people.
5. **While international and national agricultural research systems possess different capacities and complementarities, USAID has been able to successfully broker their cooperation and collaboration.**
6. **As in all facets of development, partnerships among donors, emphasizing the comparative advantage of each, are most effective in assisting developing countries apply science and technology to agriculture.**
7. **Science and technology are necessary, but not sufficient to advance agricultural development on their own.** Complementary investments in research institutions, markets, transport, finance, extension, and information and communications technology are also necessary to maximize the contributions of science and technology.
8. **As markets mature, the private sector will play an increasingly important role in agricultural research and development.** USAID investments have already shifted towards the private sector and opened the door for active private sector participation and partnerships with other donors, host governments, IARCs, NARSs, producer groups, civil society organizations and non-governmental organizations.

ERADICATION OF “CATTLE PLAGUE,” ALSO KNOWN AS RINDERPEST

After centuries of recurring pandemics of rinderpest, on June 28, 2011, the United Nations officially declared the disease to be eradicated. USAID’s support is part of the story. This cattle disease is also known as the “cattle plague” because of its devastating effects on livestock, especially cattle and buffalo, and the dread it evoked in their human handlers. Previously known in Europe and Asia, rinderpest caused widespread famine when introduced into sub-Saharan Africa in the late 1800s. Animal-source food is extremely important for physical and cognitive development in undernourished populations such as those in sub-Saharan Africa. Cattle also provide other assets such as dung for fuel or fertilizer; traction for crop farming, and a means of savings and exchange as an informal banking system. The urgent need to wipe out rinderpest challenged scientists around the world. Caused by a deadly virus, rinderpest is only the second infectious disease to be eradicated by human efforts (smallpox being the first). Experts praise this as probably the greatest achievement in veterinary medicine.

The last strongholds of the rinderpest virus were remote pastoral areas in Africa where transporting vaccine at low temperatures required ice to keep the vaccine at refrigerator temperatures. Maintaining a temperature-controlled supply chain, or “cold chain,” was particularly problematic. Overcoming this



JOYCE TURK

Kenyan Masai herders and their cows.

major hurdle to mass vaccination came out of vision-driven work, much of which was funded by USAID, for the development and deployment of a heat stable (thermostable) vaccine. USAID entered into a unique partnership with researchers in the 1980s at USDA's Plum Island Animal Disease Center and Tufts University's School of Veterinary Medicine for managing the process of vaccine research and development. Developing a thermostable rinderpest vaccine that could survive for 20 weeks at body temperature (37° C) would allow the vaccine to be transported and stored at the remote locations where the disease persisted. The resulting vaccine, a modification of the Plowright vaccine, was commercially produced at large scale by 1992 and tested in Niger with USAID funding. No longer having to maintain the cold chain saved Niger more than \$3 million annually. Subsequently, in remote regions in other parts of Africa, vaccination programs were implemented by trained pastoral livestock owners guided by veterinarians. These innovations represent a milestone in the history of veterinary medicine not only because rinderpest was eradicated but because service delivery models were developed where community animal health workers transported and administered the vaccine in faraway and sometimes insecure areas.

USAID also supported development and testing of a second type of thermostable rinderpest vaccine in the 1980s, one of the first recombinant livestock vaccines. While this vaccine was not used in the eradication, it was an early and significant proof of principle for the development of recombinant livestock vaccines. Proteins on the surface of the rinderpest virus that induced protective immune responses in cattle were identified. The genetic code for these proteins was transferred to a weakened form of the vaccinia virus (the reason why it is termed a "recombinant" vaccine); the vaccinia virus was the same viral vector used to make the smallpox vaccine. Funding from USAID enabled scientists to demonstrate that the new vaccine protected cattle against rinderpest and was safe even at high doses. Moreover, it did not require sterile syringes and needles since the vaccine could easily be administered through a scratch on the animal.



THREE

Instituting Agricultural Education and Training

BUILDING EDUCATIONAL INSTITUTIONS TO STRENGTHEN HUMAN CAPACITY AND EXTENSION SERVICES FOR TECHNOLOGY ADAPTATION, TRAINING AND DIFFUSION

“I have been teaching plant pathology in four universities and supervised over 20 M.A. and Ph.D. students in plant pathology.”

“My institution became the most vibrant in research activities and research outputs during my tenure as director. It has one of the largest independently sourced budgets.”

“The ‘result oriented’ state of mind is now being accepted by my subordinates, very untypical to a government organization.”

“My institution was able to provide sound and good advice to government agriculture sector to increase crop yields and food security.”

“The establishment of a seed grower program rapidly increased the national seed program and the conversion to a corporate entity and paved the way to privatization.”

“Things that people learn in their academic life programs will affect the way they live and perceive everything else not only at work but within their families, friends.”

These quotes are from graduates of USAID’s African Graduate Fellowship Program (AFGRAD), 1963–90, and its successor, Advanced Training for Leadership and Skills (ATLAS), 1991–2003, gathered by the 2004 survey, “Generations of Quiet Progress: The Development Impact of U.S. Long-Term University Training on Africa from 1963 to 2003.” The quotes attest to the impact of USAID-sponsored education on individuals, communities, institutions and countries. Spanning four decades, the AFGRAD and ATLAS programs helped 3,219 Africans receive bachelor, masters and

AT LEFT: Adult Education, Shaukat Ali Jarwar, Pakistan

Ph.D. degrees in the United States. This education equipped them better to take on responsible positions and advance the development of their home countries.

Throughout its 50-year history, USAID has not only trained promising young scholars in the U.S. but has also helped to build institutions in developing countries that provide agricultural educations to even larger numbers of youth. The Agency has invested extensively in strengthening and building agricultural institutions—universities, research systems, and extension and training systems—to provide lasting infrastructure to help ensure that agricultural training and education is self-sustaining.

The Agency has helped develop extension services to provide training for farmers and others in the food and agricultural sector to transform production systems and livelihoods in rural areas. Over time, USAID has promoted education, extension and training systems that use a multidisciplinary problem-solving approach, actively engage farmers as participants, transfer new technologies and practices that have been tested under farmer field conditions and that are cost-effective in meeting market demand, and provide continual feedback between extension and research systems. Sustainable intensification of agriculture, with attention to sound soil and water management, is getting increasing attention.

All in all, education has been at the heart of USAID's agricultural development work for good reason: knowledge is the basis for change. USAID has worked to unite a diverse group of stakeholders to streamline the delivery of knowledge and

develop sustainable agricultural systems around the globe. Generations of agricultural researchers, educators, extension agents and other leaders in developing countries received their training with USAID support and went on to make indispensable contributions to improving the livelihoods and building the futures of millions of rural families.

ACHIEVEMENTS

Education and training have been enormously successful components of USAID's contributions to agricultural development over the past half-century. However, the very nature of education means that this work will never be complete; each succeeding generation must be educated, and as the range of stakeholders widens and new issues emerge, the methods of imparting new agricultural knowledge are constantly evolving and improving.

3.1 BUILDING HUMAN CAPACITY IN AGRICULTURE THROUGH EDUCATION AND PARTICIPANT TRAINING

USAID has provided scholarships to qualified students from developing countries for long-term graduate studies in the United States. After graduation, the students carried their skills and expertise back home and passed them on to farmers, colleagues, rural entrepreneurs and new generations of students. The number of participants starting their agricultural academic programs of six months or longer increased steadily in the 1970s and 1980s to a peak of 758 in 1986 and 1988. This number gradually declined as university capacities increased in developing

countries themselves, costs of higher education rose in the U.S., the focus shifted from university to primary and secondary education, and needs for short-term training took priority. While the Agency's traditionally strong commitment to long-term graduates waned in the late 1990s, it has rebounded somewhat in recent years as the benefits of building lasting professional ties between countries have taken hold. The number of annual agricultural scholarships rose from a low of 188 students in 2003 to 572 in 2007.

Besides the AFGRAD and ATLAS programs above, the Collaborative Research Support Programs (CRSPs, Chapter 2) have supported agricultural research, education and training for nearly half of the Agency's existence. CRSP training programs concentrate both on short-term human and institutional capacity building and long-term graduate-level education in agriculture and rural development. Most of the students' research is done in their home countries, allowing them to maintain and build contacts with their national peers, and remain up to date with their national issues. During 1978–2007, 3,145 CRSP trainees earned degrees, of which 2,779 were post-graduate degrees. Nearly 75 percent of the trainees were from developing countries (of these, nearly half came from Africa). Graduates of CRSP programs acquired not only technical knowledge, but also skills like teamwork and a willingness to challenge conventional wisdom that are critical to success. An important part of CRSP education and training is the opportunity for close mentoring and building long-term collegial relationships within a network of scientists working in the same

area, tackling similar problems. The CRSPs helped sustain long-term agricultural training during the lean years in the 1990s and early 2000s when many other avenues were closed. It is partly due to CRSP accomplishments in integrating into research and development programs that USAID has returned to human capacity building.

In a 2009 survey of Kenyan and Vietnamese graduates from the Aquaculture CRSP-funded university programs in Kenya and Thailand over the previous decade, all graduates reported acquiring new knowledge, skills and attitudes that had an "important impact" on their professional development. They were able to apply this training in the workplace and reported improvements in organizational output, performance and productivity as a result of their training, as well as in other areas in their life.

Not all training is long-term. In the period 1983–2009, USAID sponsored a total of 177,717 people (averaging 6,582 each year) from 62 developing countries to participate in short-term technical programs that include tailored subject-matter programs, internships, observational study tours, on-the-job training, conferences, seminars, short courses, and workshops. From a peak of 13,705 short-term trainees in 1995, USAID sponsored about 3,700 per year, on average, during the 2000s. Short-term and in-service training is particularly advantageous for agricultural educators and other professionals, allowing them to return home and quickly apply what they've learned in their own classrooms, agribusinesses, farmer organizations and communities.

MAKING THE RIGHT CONNECTIONS

While a lot of investments were made in developing the Green Revolution technologies (chapter 2), the speed with which they were adopted and diffused depended on how effectively these technologies were communicated—providing information to change farmers' knowledge, leading to changes in attitudes and acceptance and adoption of new practices. Key to this is the relevance of improved technology to the farmer's situation and the competence and credibility of the "change agent" to introduce the new technology.

USAID took two approaches to transferring technology. First, USAID's research project on Diffusion of Innovations in Rural Societies, begun in 1964 through Michigan State University (MSU) and working in Brazil, India and Nigeria, aimed to develop improved research methods for the study of diffusion and adoption of innovations in traditional societies; identify knowledge that was useful to change agents (village innovators and opinion leaders), identifying the role and influence of alternative communication channels and approaches, testing these approaches, and assessing the influence of the many factors influencing farmer adoption of new ideas; and strengthen host-country research into diffusion-adoption models. The project set

up a Diffusion Documentation Center that amassed more than 1,000 publications by 1966; developed an early use of computers to simulate how innovations are diffused in village societies; trained Diffusion Research Fellows from developing countries in communication techniques; and set up working relationships with counterpart national institutions.

Second, as adoption and diffusion also depend on the availability and quality of extension services, USAID took lessons from the experience in the U.S. of the National Project on Agricultural Communications (NPAC), 1953–60. Its largest activity was communications training and the "train the trainer" approach was at the forefront, based on four communications training modules for basic, oral, written and visual skills, each incorporating the latest technological advances and training by doing. This approach elevated the role of communications and got different disciplines to work together for effective messaging. USAID's predecessor, the International Cooperation Agency (ICA), contracted with MSU, through NPAC, to establish a short-term training course to help returning students successfully apply their new knowledge, skills and abilities in their home countries.

From the early 1960s through the late 1970s, MSU conducted communication seminars for developing country students pursuing academic programs in agriculture and other fields at U.S. universities. These seminars provided training in effective communication, thereby supplementing and enhancing application of the knowledge and skills that these students were learning in their technical fields of study. By 1978, MSU had conducted over 550 of these training seminars and reached 30,000 students.

Subsequent to the MSU program and into the 1990s, the Management Training and Development Institute (MTDI) provided one-week Management Communication for Development seminars, building on the design of the original MSU communication seminars. USAID sponsored most of the participants.

MTDI expanded its curriculum to two-week courses on multiple topics covering leadership, listening, critical thinking, decision making, conflict resolution, and team building. Over the years, MTDI seminars reached more than 10,000 students from 123 countries.

Moreover, these communications training philosophies migrated to the IARCs through the communications staff at IRRI, CIMMYT, CIAT and IITA. Aspects of these communications approaches have been incorporated in the CGIAR system generally, reinforcing the key roles of the “train the trainer” and “learning by doing” approaches in supporting and accelerating technology transfer to farmers.

More recently in 2011, the Agency announced a new initiative, the Borlaug 21st Century Leadership Program to provide training to future leaders and help strengthen agricultural institutions. With support for strategic planning, donor coordination and financing, the five-year Program will strengthen more than 65 African agricultural research institutions and will directly reach more than 2,300 students with fellowships, training and mentoring.

3.2 BUILDING AGRICULTURAL INSTITUTIONS AND INSTITUTIONAL CAPACITY

Along side training individuals in agriculture, USAID built agricultural institutions in developing countries and enhanced their effectiveness for national agricultural development while actively improving the capacity of U.S. universities to play a supporting role. In this effort, USAID turned to the land-grant university approach to learning that creates new knowledge through research, brings research results into the classroom, and then disseminates it to communities and institutions

outside the university. This process has not only helped the countries with which USAID engages, but also become a two-way street, with U.S. universities benefiting from these overseas partnerships.

USAID contracted with American universities to partner with overseas universities, providing strengthening grants through Title XII of the Foreign Assistance Act (1975) for helping U.S. institutions that were inexperienced with foreign technical assistance work. This transformed the basic character of U.S. universities as new courses on developing country agricultural subjects were developed or modified, enrollment in them increased, graduate students started doing field work in developing countries, large numbers of faculty started research in developing countries or research in the U.S. directed at developing country problems, and new language courses were targeted at languages useful in developing countries.

Close to one-half of USAID funding to U.S. universities was targeted on agriculture in the 1960s and 1970s. From the early 1950s through 1996, USAID and its predecessor agencies provided \$456 million and played a key role in developing 63 agricultural universities in 40 countries. Many of these universities helped to accelerate their countries' agricultural growth and associated decline in poverty.

Three among many notable examples of USAID's success in building and strengthening agricultural institutions and capacity can be found in India, Brazil and Ethiopia.

India

The 1950s was a time of chronic food shortages across India. In 1955, India and the United States established the first collaborative effort between the two nations to develop a decentralized network of state agricultural universities (SAUs) in India, directly responsible to each state and mandated to work on statewide agricultural constraints and opportunities. By 1960, the first SAUs were fully functioning and had begun working to solve the food shortage.

From 1952 to 1972, USAID contracted the six land-grant universities of Illinois, Kansas State, Missouri, Ohio State, Pennsylvania State, and Tennessee to help the Government of India develop eight agricultural universities in India at an approximate total cost of \$31 million in U.S. dollars and \$11 million in U.S.-owned rupees. During the 20 years of cooperation, 337 U.S. faculty members were assigned to posts in India and more than 1,000 Indian students received M.Sc. and/or Ph.D. degrees from the six U.S. universities. This legacy of support to India's state agricultural universities (SAUs) is of particular interest, given that India sought to adapt the U.S. land-grant model in the development of a national system for agricultural higher education. The establishment of the first eight universities laid the foundation for a national, state-based system of 28 agricultural universities by 1988 and 41 by 2008, with some states having more than one SAU.

Later, USAID provided funding for five U.S. universities—Illinois, Kansas State, Missouri, Ohio State and Tennessee—to begin partnerships with nine of the newly established Indian state

agricultural universities. The U.S. universities supplied more than 300 professors on assignments of two years or more for the SAUs. The initiative not only sent American experts to live and work in India, it also brought Indians to the United States for training that gave them the skills to fill specific needs when they returned home. USAID also provided textbooks, laboratory equipment and other teaching equipment for the SAUs. The U.S. universities provided on-campus coordination and technical backstopping of all aspects of this effort. According to a 1988 evaluation, these state universities had a “considerable impact” on agriculture and rural life in India.

India’s large-scale buildup of human capital helped form a productive agricultural research, extension and education system. As a result,

India was able to develop the domestic talent and technology to sustain the rapid increases in staple food production that came to be known as the Green Revolution. As India achieved food self-sufficiency by the late 1980s, the SAUs were able to shift gears to focus on improving food staple productivity rather than production, improving and diversifying diets, adapting food processing technologies, and promoting an increasingly diverse agriculture that includes milk, poultry, fruits and vegetables. While SAUs need continual attention to updating their mission, management and methods, much of India’s success in the past 50 years has been credited to political stability, its openness to institutional innovation, and a sense of urgency to contribute to improving household food security.

ACHIEVEMENTS OF STATE AGRICULTURAL UNIVERSITIES IN INDIA

... Among them are increased manpower for veterinary services; improved poultry and egg production; increased opportunities for women—even in agronomy and animal sciences; development of trained staff for government services; development of regional research stations in numerous agroclimatic zones, in part as a result of the National Agricultural Research project; use of artificial insemination to improve cattle breeding; major increases in milk production; animal feed improvement; massive increases in the production of wheat and rice, especially in irrigated areas; increases in selected areas of production of sorghum, millets, pulses, and minor crops; resolution of crop micronutrient shortages; greater use of biofertilizers and biological control methods; creation of farmer demand for extension through radio and television programs, bulletins written in local languages, and annual farmer fairs; and the creation of a cadre of skilled agricultural loan officers for the banks.

Universities for Development: Report of the Joint Indo-U.S. Impact Evaluation of the Indian Agricultural Universities. A.I.D. Project Impact Evaluation No. 68. 1988.

Brazil

Much like India, Brazil has achieved stunning agricultural success that is largely attributable to the collaboration between the U.S. and Brazil in research and education over the past 50 years. Here, too, USAID has played a catalytic role in helping to transform the country into a global agricultural powerhouse that not only feeds its own population, but also leads the world in production of coffee, oranges and sugarcane, as well as bio-fuel research.

From 1963 to 1973, four U.S. universities—Purdue, Ohio State, Wisconsin and Arizona—and four Brazilian agricultural universities received support to improve the quality of undergraduate teaching in Brazil. This brought integration of research and extension programs into the universities, and helped hundreds of Brazilians pursue graduate training in Brazilian and U.S. universities.

With USAID's support, Brazil's human capital improvement plan has shown impressive results. At the Federal University of Ceará in the country's Northeastern State, only 2 percent of the agricultural faculty had advanced degrees in 1963. In fact, most worked part-time. By 1973, 86 percent of the faculty worked full-time and by 1986, 82 percent held advanced degrees. From 1973 to 1989, the university produced 335 Masters theses in fields of agriculture. The introduction and growth of graduate programs was a key factor in expanding the research output of Brazilian agricultural universities. Today, Brazil is home to more than 5,000 full-time equivalent, nationally funded researchers, and the country's total research

expenditure accounts for about half of Latin America's total agricultural research spending.

A study conducted by USAID's Center for Development Information and Evaluation found that nearly all the postgraduate programs begun with USAID support continued after USAID funding ended. Brazil now has 26 institutions offering 120 Masters and 23 Ph.D. programs in agriculture. The impetus for nearly all these programs can be traced to USAID support that helped to transform Brazil's agricultural development in a systemic and sustainable way.

Ethiopia

In 1950, Ethiopia's agricultural sector was among the world's least developed. Responding to Ethiopia's pressing needs, about half of the USG development budget for Ethiopia during the 1950s focused on developing high school and college agricultural educational facilities and some agricultural research capacity.

With support from USAID's predecessor agency, Oklahoma State University (OSU) set out in 1951 to establish a college of agriculture, eventually located in Alemaya, a countrywide system of agricultural extension services and agricultural experiment stations. The dilemma was that OSU found very few students with the suitable background and training to enroll in college-level courses.

To lay the foundations for the College of Agriculture, OSU had to first equip and upgrade an agricultural technical high school at Jimma as the source of students for the university. Classes began on schedule in 1952. Of the first class of



GERRY LARU

Ethiopian coffee tasters hone their skills during a Coffee Corps Advanced Cuppers Training Seminar.

80 students, 50 went on to complete B.Sc. degrees at the College of Agriculture, 26 of those went on to receive M.S. degrees from U.S. institutions, and 16 pursued Ph.D. degrees. Twelve classes comprising 550 students graduated from the agricultural school while OSU worked there, 1952–1968. A final impact evaluation in 1968 found that 50 percent of those graduates continued their education at the College of Agriculture and 94 percent were either employed in agriculture or continuing their education in preparation for employment in agriculture. Graduates were notably dominant in the country’s agricultural extension service, but were also found throughout Ethiopian government ministries, educational institutions and private industry.

A significant feature of the education of these high school students, and a cultural change for those with formal learning, was the requirement that they roll up their sleeves and participate in agricultural research projects focused on solving real-life problems of Ethiopian agriculture. This made its graduates more knowledgeable about scientific research methods and relevant research findings during their careers.

Though the Ethiopian College of Agriculture and Mechanical Arts developed more slowly, by the 1967–68 school year, the last year of OSU’s contract with USAID, it offered some 33 and 53 courses for lower and upper division students, respectively. Courses covered the normal array of basic sciences, general agricultural plant and animal sciences, animal husbandry, agricultural engineering, agricultural economics, teaching and extension methods and other courses to meet the broad spectrum of anticipated Ethiopian agricultural development needs. During 1950–69, 248 Ethiopians continued their university training in agriculture in the United States, funded by USAID scholarships.

USAID’s considerable investments in Ethiopia’s agricultural education institutions through Oklahoma State continued to pay long-term dividends. During a visit to the College of Agriculture in 1985, a former professor from OSU found the original equipment well-maintained and operative, 800 full-time students, and 500 students enrolled in part-time continuing education and special programs. Faculty totaled 110, only 17 of whom were expatriates, and the

rest Ethiopians, almost all trained under OSU. Research was ongoing and the high school at Jimma was continuing to graduate students in vocational agriculture. Though the rupture of the connection with OSU had created some problems for the Ethiopian institutions, ties continue and the benefits of long term associations carry on—evidence of how important investments by USAID can have long-term and sustainable payoffs.

USAID has renewed its support for agricultural education institution building through programs such as Higher Education for Development (HED), founded in 1992. In 2007 it launched the Africa-U.S. Higher Education Initiative. This project, a collaboration between USAID, the Association of Public and Land-grant Universities (APLU) and eight other U.S.

higher-learning groups, was created to build the capacity of African colleges and universities through partnerships with U.S. institutions to focus on agriculture, environment and natural resources, science and technology; and business, management; economics and other fields. As another example, in 2011, USAID awarded a grant to a five-university consortium lead by Ohio State to boost the training and research capabilities of Tanzania's national agricultural research and extension system and Sokoine University of Agriculture, the chief institution of higher learning, research and outreach for the agricultural and agribusiness sector in Tanzania. The award will help educate the next generation of agricultural and nutrition scientists in Tanzania and the region.



PHILIP STEFFEN

USAID-funded NGOs train farmers in South Sudan in oxen plowing during the dry season.

3.3 BUILDING TECHNOLOGY AND ORGANIZATIONS TO SUPPORT FARMERS

Agricultural extension and advisory services help rural people improve their agricultural productivity, profitability and livelihoods in sustainable ways by expanding access to knowledge and information. Early on, USAID had a high learning curve in finding the right mix of approaches.

Success in boosting agricultural productivity in the United States and in Europe after World War II, through the introduction of new technologies, led many to believe that similar improvements in farming techniques and inputs could substantially—and readily—increase the agricultural production of developing country farmers. However, USAID soon found that introducing modern tools and techniques to these farmers was a complex undertaking. USAID ran into formidable obstacles, such as farm size and land quality; farmer income, education levels and receptivity to new practices and risks; nascent input delivery and credit systems; harmful government policies that reduced the profitability of agriculture and incentives for investments in innovation; and long distances to markets that discouraged producing surpluses to sell.

As a result, USAID'S early efforts to catalyze agriculture improvements in developing countries focused on transferring improved technologies to farmers that made sense in the context of local conditions. The American land grant university teaching-research-extension system offered a model with proven results.

In the 1950s and 1960s, USAID and its predecessors played a prominent role in expanding

public extension systems throughout the developing world. Starting nearly from scratch, USAID helped create extension systems in nearly a dozen South and Central American countries. Throughout Africa, Asia, and Latin America, USAID trained and assisted national extension workers, expanded national extension systems, and provided direct national extension services to farmers by USAID personnel, many who used to be extension agents themselves in the United States.

Many USAID-supported national extension service activities improved agricultural practices directly and significantly. USAID was instrumental in Taiwan's rice revolution. USAID supported the Agricultural University in Peshawar, Pakistan in making research results directly relevant to farmers. USAID expanded the capacity of Egerton University in Kenya to offer expert extension through mid-level technicians, a practice that continues. In Ghana, Ivory Coast, Nigeria and Cameroon, USAID is partnering with two other organizations to expand cocoa farmer education and training programs while improving the genetic quality and productivity of the cocoa varieties under cultivation. Globally, USAID supported the introduction of new crops, modern fertilizers, commercial poultry production, animal traction, and a variety of other agricultural techniques.

But not all extension efforts were a resounding success. Difficulties reflected the insufficiency of most existing technology—and the absence of much new technology. They also reflected USAID's own extension approach at the time—an emphasis on working with national extension bureaucracies while overlooking farmer organizations as means

for transferring technology and developing local skills; communications process over technological content; and an oversimplified view of the U.S. extension experience. In some instances, the national extension systems had their own problems, being poorly funded, overly centralized, and weakly linked with researchers, universities, private agribusinesses and others. Overworked extension agents had limited contact with farmers and few new technologies or practices to offer. Often, these new extension services were unable to sustain a high ratio of extension agents to farmers and other recurrent costs.

Over time, USAID reflected on these challenges and realigned its initiatives to achieve better results. For example, USAID-supported programs began engaging local farmer groups to participate in the design, testing and dissemination of new agricultural technologies. USAID has also increasingly worked to decentralize agricultural extension and information services, using mass media and information communications technologies in extension.

An example of USAID's new approach was the Farming Systems approach to research and extension.

USAID set out to improve its approach for agricultural extension in 1985, including strengthening public extension services, by linking research and extension; linking the private sector to public extension systems; using PVOs as implementing agencies and continuing support for the Farming Systems approach; making better use of radio and other mass communication approaches; and stimulating private extension services.

Evidence of successful USAID-supported extension efforts was a willingness and ability of farmers and other rural groups to accept change and innovate in their use of technologies, resource management practices, organizational arrangements, institutions, and environmental resources. USAID found that poor and small-scale farmers would change their agricultural practices when offered improved technologies and given appropriate information; PVOs and NGOs could effectively reach poor and isolated farmers; and geographically-focused extension units could transfer knowledge effectively.

But as Agency funding for agriculture began to shrink in the 1990s (Overview), agricultural extension was an early casualty.

Another long-standing and popular example of USAID's approach to education and training is the Farmer-to-Farmer program. Through this program, U.S. agricultural producers and businesses transfer their knowledge and expertise on a voluntary basis. The program, initiated in 1985, has earned respect for the high-quality technical services it provides. Volunteers generally work with rural cooperatives and producer organizations and their ability to resolve local problems. Major focus areas include horticulture and high value crops, income diversification, dairy and livestock, producer organizations, financial services, marketing and processing, and natural resources management.

Farmer-to-Farmer emphasizes economic impact by concentrating volunteer assignments in specific geographical areas, commodity programs, and service sectors. Measurable impacts

ELEMENTS OF THE FARMING SYSTEMS APPROACH TO RESEARCH AND EXTENSION (FRS/E)

The conventional approach to agricultural research and extension didn't always work well because commodity or discipline-centered research based at experiment stations followed a top-down technology development and transfer model. Because of faulty assumptions about small farmer behavior, researchers developed 'improved' technologies that farmers often did not adopt.

A new approach viewing the farm as a **system**, took into account the full range of factors that influence farm household decisions—their goals, preferences, skills, resources, activities and management practices, as well as factors that the households can control and the interactions of all these factors with the local agro-ecological, physical and socio-economic environment that the household cannot control.

Based on nine core characteristics, Farming Systems Research/Extension:

- » *is farmer oriented, where small farmer households are the client group;*
- » *involves the client groups as participants in the research and extension phase;*
- » *recognizes the location specificity of technical and human factors;*
- » *is a problem-solving approach;*
- » *is systems-oriented, evaluating the potential use of an improved technology in one or more production subsystems and its impact on the farming system as a whole*
- » *is interdisciplinary;*
- » *complements, not replaces, conventional commodity and discipline research;*
- » *tests technologies in on-farm trials, and provides feedback for shaping research priorities and agricultural policies.*

USAID used this farming systems research approach in some 75 projects between 1975 and the late 1980s. Encompassing technological development and institutional change, FSR/E required a much longer timeframe to achieve significant results than the usual 3–5-year project. Nonetheless, as reported in a 1989 review, USAID Missions placed a high priority on facilitating technology transfer, training in FSR/E, and institutionalizing the farming systems approach.

A Review of A.I.D. Experience with Farming Systems Research and Extension Projects. A.I.D. Evaluation Special Study No. 67. October 1989.

on incomes and productivity are possible even with targeted short-term volunteer assistance if assignments are well planned. Serving 40 core countries, over 10,000 volunteers have contributed their time and energies to aid approximately one million farmer families (representing about five million people), who have been direct beneficiaries. This program has demonstrated that there is strong commitment to the humanitarian and volunteer ideals in the American public that supports international development.

Today, recognizing that more complex agricultural knowledge and information systems

are needed to serve a diversity of farmers and other rural groups, USAID works to involve public and private sector providers, including input suppliers, produce buyers, farmer organizations, NGOs, consulting firms, and government organizations; deliver knowledge and information through the private sector or mass media; use cost-recovery, fee-for-service, and cost-sharing to improve financial sustainability and ensure responsiveness to client needs; and employ demand-driven, participatory approaches and decentralized administration to improve effectiveness.

In 2011, USAID embarked on a major effort through its Modernizing Extension and



A climate station in Croatia alerting farmers of weather changes by mobile phone and E-mail encourages them to try integrated fruit production.

Advisory Services cooperative agreement through universities and other partners to disseminate good practices, strategies and approaches for establishing efficient, effective and financially sustainable rural extension and advisory service systems.

CONCLUSIONS

The need for developing strong and effective agricultural institutions remains great. USAID has been a major investor in the agricultural research, extension and education systems of dozens of countries around the world, most of which are firmly established and self-sustaining. Development of effective agricultural institutions has hastened the historic structural transformation of agriculture where fewer farmers feed more people, agriculture's share of the economy decreases and poverty declines with the drop in real food prices.

USAID's linkages with overseas universities persist and continue to evolve. Expanding information and communication technology capacities are enabling new partnerships to improve institutional capacity. With continued USAID support, these partnerships are poised to help training and education and institutional capacity to grow again.

Due to the rising costs in higher education, USAID is now introducing lower-cost alternatives through sandwich programs (where a student's research overseas or in the United States is "sandwiched" between course work in the home country and the return home to write and defend a thesis or dissertation), distance education (these days, usually by internet), and other increased use

of information and communication technology (ICT). Other options include support for short, problem-focused technical training courses or national and regional training programs having the added advantage of allowing students to stay closer to home and focus their research on local and national problems.

USAID is making better use of ICT in agricultural extension for sharing information about problems or opportunities in agricultural production, marketing, conservation, resource management, and rural livelihoods. Investing in high speed internet, low-cost computers, smart phones and community radio are effective ways to reach many in an era of tight budgets.

The divisions between disciplines are blurring. Redefining the relationship and responsibilities between agriculture, on one hand, and management of the environment; globalization and commercialization; new technologies; nutrition and food safety; and a broadening range of public and private sector stakeholders and interests, on the other hand, opens new possibilities for integrated education and training.

LESSONS LEARNED

1. **With sufficient time and investment, strong institutions deliver results.** Building and strengthening a national research system, extension system and agricultural university system that integrates research, education and extension takes decades but the returns on investment are high. USAID remains committed to long-term investments in institutional development.

2. **USAID draws on an increasingly diverse set of partners for building human and institutional capacity in agriculture.** U.S. land-grant universities, with their venerable model of research-extension-education, have a depth of experience and durability to tap. USAID collaborates closely with the CGIAR centers and private foundations. Others include farmer organizations, PVOs and NGOs, consulting firms, and government organizations, especially the U.S Department of Agriculture.
3. **Both institutional and human capacity building are dynamic.** The work of educating young people and retraining mid-career staff is always unfinished. The structure and content of education and training, both for individuals and for institutions, change with time and circumstances. The form that institutions take is also changing with technology and USAID agricultural education and training programs are changing along with it.
4. **Agricultural education, research, and extension systems need to continually adjust to maintain their relevance.** Urgent priorities going forward include staff continuing education as well as recruitment and retention of new personnel to replace those trained years ago by USAID; upgrading curricula to emphasize multi-disciplinary, problem-solving approaches and modernizing teaching and training methods; finding innovative and efficient ways to deal with rising costs; aligning agricultural education and training institutions to meet national and regional development goals as well as market demand; and linking with external constituencies. A special challenge for universities is to develop an effective means of communicating and cooperating even when reporting to different ministries.
5. **Agricultural education, extension and learning are part of an integrated system.** Today's globalized and knowledge-intensive agricultural systems require continuing education for the workforce and a more integrated agricultural education system comprising extension, formal education, in-service training and mass-media/distance-education programs. A more integrated system can improve the effectiveness of the entire system by serving students of diverse abilities and backgrounds, and increasing their relevance and responsiveness to employer needs through a wider mix of graduate qualifications.
6. **The content of agricultural extension messages, effectively presented, is more critical than the means of communication.** For farmers and others to absorb extension messages and change their agricultural behaviors and practices, extension messages must lead to clear improvements in productivity and profitability. No amount of extension messaging can popularize practices and technologies that are essentially unprofitable or that entail the possibility of uncompensated risk.

7. **Agricultural extension messages must be tailored to the agro-ecological conditions and practical day-to-day realities that the target audience faces.** Acceptance of extension messages must also be within the financial means of farmers, herders and other rural groups and backed by a host of private service providers and supporting markets, institutions and infrastructure. Farmers will not try improved seeds, for example, if they cannot afford or access the right fertilizers that are part of the package. Herders will not vaccinate their cattle if the lack of local refrigeration makes vaccines unavailable.
8. Ever since USAID largely ended direct implementation of projects by its own personnel, it has successfully harnessed the skills of NGOs and local firms to implement **most of its extension activities**, including Food for Peace development activities. These NGOs and local firms often have deep roots in the communities they serve, and the right training, language skills, and cultural awareness to be effective. Most personnel are deeply committed to their work. Moreover, they can be valuable sources of local information and feedback as well as partners for monitoring and assessments.



PHILIP STEFFEN

FOUR Managing Market Performance

IMPROVING MARKET INSTITUTIONS, INFRASTRUCTURE, SERVICES AND PERFORMANCE TO INCREASE PRODUCTION AND PRODUCTIVITY INCENTIVES, AS WELL AS FOOD AVAILABILITY AND ACCESS

Agricultural markets perform four critical functions. They provide a means of transferring ownership; determine prices through interactions between buyers and sellers; provide a setting for transformation of agricultural commodities in time, place and form; and coordinate transactions between all stages—from producers and first handlers to retailers and consumers. Well-functioning markets also spur entrepreneurship and innovation, agricultural research and productivity gains. Conversely, weak markets act as a drag on all participants, minimizing opportunity, profits and adoption of new methods.

USAID invests in markets because markets coordinate the economy. Just as importantly for rural development and food security, well-functioning markets also help reduce poverty by lowering costs and moderating price and supply volatility. This improves the purchasing power of the poor, who in many parts of the world spend half or more of their limited incomes on food. The Feed the Future initiative is premised upon—and made possible by—well-functioning markets.

ACHIEVEMENTS

Early on, USAID and its partners realized that well-functioning markets don't just happen. Indeed, markets in developing countries were often described as unorganized, unpredictable and unreliable. USAID has been a pioneer in helping to improve the performance of markets as a mediator of supply and demand conditions between locations and seasons, reflecting consumer preferences at a range of costs and qualities. By taking steps to encourage conditions that open markets and level the playing field across the supply chain, USAID has dramatically improved markets in countries across the world. The following achievements illustrate USAID's leadership in helping "getting markets right."

AT LEFT: About one year after the signing of the Comprehensive Peace Agreement in 2005, peaceful conditions allowed food markets to flourish in Yei, South Sudan.

4.1 DEVELOPING METHODOLOGICAL APPROACHES FOR DIAGNOSING MARKET PROBLEMS AND RECOMMENDING SOLUTIONS

In the 1960s, development planners tended to prescribe expanding agricultural production without sufficiently considering what takes place when goods leave the farm and enter the market supply chain. In 1964, the U.S. Department of Agriculture (USDA) urged state agricultural experiment stations to focus on markets in addition to production. In response, many land-grant universities created new faculty positions to focus on market-based solutions. Before long, the new attention given domestic markets spilled over to international markets, creating momentum for marketing issues to enter the exciting field of development economics just then getting underway.

Many early USAID efforts were limited to descriptive and feasibility studies for public sector investment in market infrastructure. As the Agency began to consider the dynamic interplay of market institutions and development goals such as efficiency, equity, growth and employment, new approaches took a broader set of market participants into account when assessing various agricultural subsectors.

In another significant methodological advance, USAID-funded subsector analyses adapted the Structure-Conduct-Performance (SCP) paradigm from industrial organization theory and applied it to grain commodity subsectors in the early 1980s. After defining the basic conditions of the sub-sector (such as product characteristics; supply

and demand conditions; and seasonality), the paradigm describes structure, the relatively stable features of the marketing environment; conduct, the practices and strategies of market participants; and, performance, which measures the reliability of markets. The SCP paradigm remains one of standard diagnostic approaches to staple food market analysis. Some consider it a precursor to the value chain approach with its focus on end markets, reviewed in chapter 6.

4.2 REFOCUSING THE PUBLIC SECTOR ROLE ON PROVIDING RELIABLE MARKET-FACILITATING GOODS, SERVICES AND INSTITUTIONS

Much of USAID's work in recent decades has focused on promoting the private sector's role in markets. At the same time, the Agency has worked to promote a more constructive role for the public sector. To this end, USAID has worked with governments to provide services, policies and regulations that facilitate trade and competitiveness and reward innovation and entrepreneurship. This includes an enabling market environment writ large—building market-supporting infrastructure, defining and regulating standard grades and units of measure, providing market and trade information and forecasts, protecting against plant and animal diseases, and inspecting and enforcing food safety regulations to assure consumer confidence. In short, privatizing certain parts of the agricultural economy would not lead to improvements on their own without fundamentally redefining—and strengthening—the public sector's role in markets.

THE LATIN AMERICA MARKETING PROJECT (LAMP)

Some of the earliest of these subsector studies were conducted by the USAID-funded Latin America Marketing Project (LAMP), implemented by Michigan State University starting in 1965. LAMP researched the role of markets in economic development, including a new methodological approach, a review of market development's historical impact in Puerto Rico, and a diagnostic study of links between Puerto Rican food and agricultural market systems, large urban centers and rural supply areas. These diagnostic studies were replicated in northeastern Brazil and expanded to include Bolivia, Colombia and Costa Rica.

LAMP not only encompassed several countries, but a diversity of subsectors as well. These included grains, fruits and vegetables, poultry and eggs, milk and red meat. Identifying market problems was relatively simple; finding solutions proved more difficult. The usual, sometimes heavy-handed, public sector practices of regulating markets (tariffs, licensing, certifications) and supporting prices and intervening through buying, selling and storage operations blocked necessary changes in marketing institutions and behaviors. The grains subsector studies showed that none of the market participants understood the market system as a whole, a key factor explaining the poorly organized wholesale-retail distribution systems. LAMP also found that small-scale farmers who failed to specialize in those crops best suited to local climate and soil conditions faced much higher marketing costs for each unit of non-specialty crop they produced.

Using an approach that was at once pragmatic and eclectic, LAMP studies identified managerial, technological and institutional innovations aimed at overcoming constraints from the perspective of local officials and market system participants themselves. This new approach focused on vertical coordination, involving all stages value-addition of agricultural markets, as the central organizing framework for agriculture's role in national economic development.

LAMP identified three levels at which development must take place: farms, processing companies and food distribution systems. While conscious of the need for the government to provide some "rules of the road," LAMP made a clear distinction between necessary and beneficial public sector interventions and those that held markets back. LAMP advocated for public sector provision of market-facilitating investments and services, such as roads, information and inspection services that stimulate improvements in market performance and thereby production incentives, productivity improvements and dynamic growth in the food marketing systems.

One of USAID's biggest challenges and successes was overcoming host government skepticism that markets really work, especially for politically- and socially-sensitive food and agricultural markets, and allaying mutual suspicions between governments and private sector traders. Many governments distrusted the private sector, perceived as colluding to fix prices, hoard supplies or distort markets through other means. For their part, traders distrusted governments because of abrupt shifts in government marketing policies, with no stakeholder consultations, thereby undermining trader investments and profitability. USAID helped by guiding governments to assume the role of referee, ensuring a level playing field through fair, reasonable and transparent regulations, while leaving the field to the private sector as participants. Beneficiaries of this approach over the years include several countries in Latin America, as well as Bangladesh, Egypt, Mali and Morocco.

The Agency also developed a market-related diagnostic tool, known as AgCLIR (Agricultural Commercial, Legal and Institutional Reform), to provide in-depth analysis of the marketing environment of agribusiness and to identify barriers to starting and running farms and other agriculture-related businesses. AgCLIR provides a comprehensive method of diagnosing the root causes and inefficiencies of an underperforming agricultural sector. The diagnostic tool recommends practical actions to resolve problems such as export delays, input monopolies, overregulation and inappropriate taxation.

USAID has been instrumental in transforming the public sector's role to provide market-facilitating services proactively, as seen in compliance with food safety concerns. Over the last fifteen years, a variety of private standards and public regulations have emerged to address the safety of foods produced in developing countries and shipped to increasingly discerning global consumers. To gain access to the United States market, producers and exporters must comply with regulations administered by USDA, the U.S.



As part of USAID's early efforts to connect farmers to markets, Ayo Alawode, agricultural information specialist, Ministry of Agriculture and Natural Resources, and Anthony Astrechan, USAID agricultural information advisor, discuss a new issue of a market bulletin in Ibadan, Nigeria, in 1962.

USAID ARCHIVES

IMPROVED LIVELIHOODS AND MORE JOBS

“Voacanga Africana, a wild plant, contains several alkaloids used for the treatment of Alzheimer's and Parkinson's, as well as treatment of withdrawal symptoms in alcoholics and drug addicts. In 2004, Voacanga was plagued with poor quality, priced at \$1.50/kg, export value of \$1.5 million, complaints by importers and frequent disputes between exporters and importers. PFID/NP and Agribusiness in Sustainable Natural African Plant Products interventions included training 2,000 collectors ... and 30 exporters in Quality Assurance/Quality Control systems, introduced electronic trade and mobile telephone trading platforms as well as training 3,600 collectors annually in sustainable harvesting and post-harvest techniques. Results: Voacanga export prices, in 2008, were \$6/kg and export value increased to \$20 million. Average income per collector stands at \$1,200 per annum, providing collectors with a 30 percent increase in profit margins. Finally, transaction time was reduced from 61 to 29 days.”

Evaluation of PFID/NP, Partnerships in Food Industry Development/Natural Products; May 8, 2009

Food and Drug Administration, and the U.S. Environmental Protection Agency, among others.

So that private standards and public regulations do not act as a real or perceived set of non-tariff barriers to trade, USAID—often in collaboration with USDA—has helped to strengthen partners' abilities to comply with food standards and regulations, as well as to establish new legal frameworks, certification and inspection bodies, and food safety regulatory agencies for both domestic and traded products. Non-compliance with these standards can thwart access to current markets and entry into new ones. Thus, USAID activities have served to strengthen the public sector's role in markets as well as protect the viability of value chains and USAID's investments in them.

With funding from USAID, USDA helped build capacity in partner countries by modernizing laboratories; drafting food safety inspection legislation; developing new pesticide use regulations; creating food inspection systems; assisting food and agricultural sectors to improve compliance with the new inspection systems; and providing technical assistance for animal and plant health. These food inspection systems and new regulations greatly enhanced the ability of the public sector to help the private sector to compete. Training of individuals and assistance to private firms have contributed not only to improving the quality of food domestically but expanding horticulture exports from Central America to the United States. In some instances, they launched exports from zero. USAID-supported examples

include melons, peppers, tomatoes, asparagus, and other produce originating from El Salvador, Guatemala, Honduras, and Peru.

4.3 INTRODUCING A PRIVATE SECTOR AND COMMERCIAL FOCUS TO MARKET-LED GROWTH

Promoting the private sector focus on development is perhaps the most significant of USAID's achievements in agricultural marketing. The private-sector approach is often referred to as "unleashing the power of the private sector," "liberalizing markets," or "privatizing markets." The strength of USAID-funded research into economics and marketing policy helped open the door more widely, ushering more private enterprises into markets and carrying out more functions.

The shift to the private-sector focus began with the 1980 election of President Ronald Reagan. He and his USAID Administrator, M. Peter McPherson, encouraged the Agency to broaden its programming to support the private sector's role in accelerating growth in developing economies. Under this new approach, USAID advocated easing regulatory restrictions on the private sector, selling or dissolving state-owned enterprises, and strengthening farmer-owned and farmer-led organizations. Many of these initiatives were embraced by partner country governments, in many cases motivated as much by their own budget limitations as by a newfound appreciation for the role of the private sector.

The USAID/Bangladesh Fertilizer Development Improvement (FDI) program

illustrated USAID's-emerging approach to market development and the interplay of the private sector, market development and enterprise-building. In the early 1980s, this program aimed to privatize fertilizer marketing and distribution to improve market efficiency, promote entrepreneurship, and increase the availability of fertilizer while reducing its cost.

The FDI program's first phase (1978–87) concentrated on replacing the old state-controlled market system by liberalizing marketing policies and making the Bangladesh Agricultural Development Corporation (BADC), the fertilizer-distributing state enterprise, more efficient and market-oriented. This created a stronger role for private dealers, privatized fertilizer marketing at the retail level, and deregulated retail prices. The first phase was considered a major success in its own terms. It demonstrated that farmers would use more fertilizer, but also showed that even a long-term effort could not make BADC an effective and competitive distributor of the rapidly increasing supply of fertilizer.

The second phase of FDI (1987–94), which concentrated on expanding the role of the private sector, far exceeded expectations. Hundreds of firms emerged to take advantage of new policies allowing the private sector to import and market fertilizers. Fertilizer use increased three-fold within 16 years, contributing to an increase in rice production of more than 50 percent and a drop in the real price of rice by 30 percent. These fertilizer marketing reforms, in parallel with other substantial investments in Green Revolution technologies, created much greater stability in rice

supplies. By 1992, Bangladesh produced enough rice to feed itself and an estimated 15 million people increased their daily caloric intake and joined the ranks of the food secure.

Another example of USAID's private sector and commercial focus to support global food market growth is the Partnership for Food Industry Development (PFID), with components in natural products (NP); meat, seafood and poultry (MSP); and fruits and vegetables (F&V). Working with the private sector from 2000 to 2010, PFID-F&V partnerships focused on the rising role of supermarkets in agricultural value chains and the importance of farmer compliance with quality and hygiene standards. PFID-F&V worked in Ghana, India, Nicaragua, South Africa, and Southern Africa.

In India, for example, USAID supported mango market development in Maharashtra State. Mango growers who were able to comply with international standards received premiums of up to 30 percent on sales to the high-value domestic market and up to 60 percent on mango exports. In turn, USAID's support for such "proof of concept" initiatives in India catalyzed a broader set of food safety skills development activities. Since 2004, PFID/Natural Products programs have contributed to the introduction of new crops, the sustainable collection of indigenous African botanicals, and the development of new plant products responsible for a total production volume of 6,300 metric tons and more than \$30 million in trade.

USAID also has a history of achieving results in challenging environments. One example is the Rebuilding Agricultural Markets Project

(RAMP) in Afghanistan. Operating in severely unstable conditions during 2003–2006, RAMP helped rebuild agricultural markets by repairing irrigation systems and roads, extending agricultural technologies to improve productivity, identifying market opportunities, providing rural financial services and strengthening institutional capacities. Working through a market-driven value chain approach, RAMP concentrated on food grains, fruits and vegetables, livestock and tree nuts. This \$145 million effort resulted in \$1.7 billion worth of additional agricultural products brought to market—more than seven times the cost of the project.

4.4 PROMOTING SMALL FARMER ACCESS TO MARKETS

Barriers to markets encompass more than rough roads and long distances. Small-scale farmers around the world find themselves paralyzed by their inability to overcome widespread market distortions, including weak enforcement of contracts, inconsistent public policies, an unfavorable business climate and lack of transparency, all resulting in pervasive risk and high transaction costs. Without access to accurate and timely market information, smallholder farmers often start at a major disadvantage. They may misjudge which products to produce, pay too much for inputs, move goods inefficiently, and accept prices that are too low. They may also miss out on opportunities for financing or the chance to produce different crops in response to market changes.

In response, as part of USAID's efforts to improve smallholder farmer incomes and family nutrition, the Agency has encouraged farmers over the past three decades to shift to market-demanded higher-value crops. Farmers in developing countries have had to be able to comply with both private and public food industry standards and regulations in order to respond to rising international demand for high-value, specialty, off-season, fair trade, and organic food and agricultural products. Standards set by retailers or wholesale buyers, as well as by national and regional governing bodies, include definitions of quality, safety, traceability, labor and environmental indicators. But in many instances, smallholder farmers had no organized association

to coordinate group production and marketing decisions, nor a clear business strategy, to meet these requirements and standards.

One of USAID's major accomplishments has been to help smallholder farmers better engage with agricultural markets. USAID's recognized that without government and donor support, small farmers were not equipped to take advantage of new market opportunities. Over time, Agency and host-country support helped farmers around the world to overcome barriers to success by helping them connect to better information and link with processors, distributors and consumers to meet their product specifications.



ACDIVOCA

Palmira Lando, a resident and businesswomen in Cacongo, Angola, supplies fresh fruit and vegetable produce to local and cross-border markets.

Early USAID-supported efforts to organize farmers involved distributing inputs such as seed and fertilizer through government-organized cooperatives. USAID worked with the public-sector Agricultural Development Organization (ADO) in Laos in the late 1960s and early 1970s to develop input supply networks and rice procurement where markets were not yet developed. The ADO provided seed, fertilizer and pesticides on credit to farmers to be paid back with rice.

Despite notable USAID-supported successes, including fertilizer and milk cooperatives in India and electric cooperatives in Bangladesh, many top-down cooperatives did not perform up to expectations, especially on the marketing end. Fixed prices, mandatory sales to public procurement agencies and lack of improved storage that would help cooperatives manage their own inventories and schedule their sales all contributed to disappointing results. However, as the public sector's role began to shift from market inhibitor to facilitator, cooperatives became more effective.

In the 1990s, USAID investments in organizing farmers emphasized business skill development and business planning, often coupled with technical assistance to improve production and processing. USAID-supported work with the East African dairy industry offers an instructive example of success. The Agency took a private-sector focus to dairying, creating market linkages among input supply companies, producers, processors and other service providers. USAID assisted in five key areas: value-added processing, milk bulking, milk handling, organization of

production and industry organization. Results were impressive. Over five countries, efficiency improvements saved more than 70,000 smallholder farmers a total of several hundred thousand days of family labor; annual net farm income increased by \$750–\$900 per farm; growth in the commercial milk sector created thousands of new on-farm jobs along with more than one hundred new rural non-farm enterprises; more than 26,000 individuals received training in natural resource management (NRM) and managed 16,500 acres of land with NRM practices (up from 80 acres); and more than 20,000 unemployed poor living with HIV found paid work in dairy value chains.

Another important example of USAID's contribution to smallholder market access was the Growth-oriented Microenterprise Development (GMED) program, launched in 2004. One of GMED's most important breakthroughs was proving to the Indian food industry that with supervision, training, and access to services, smallholder farmers could be successfully integrated into organized retail supply chains and take advantage of demand from the growing supermarket sector in domestic markets. GMED linked smallholder vegetable and fruit farmers to organized food retail firms. GMED's timing was fortuitous, coinciding with the rapid expansion of supermarkets, hypermarkets and specialty fresh produce outlets across India. Growth is accelerating as consumer preferences for consistent quality increasingly favor supermarkets and major Indian corporations respond to this growing demand. With USAID support, this phenomenon is repeating itself in countries around the world.

4.5 SUPPORTING THE TRANSITION FROM SOCIALIST-ORIENTED ECONOMIES TO MARKET-ORIENTED ECONOMIES

The fall of the Berlin Wall in November, 1989 and ensuing collapse of centrally-managed economies in Eastern Europe and the former Soviet Union ushered in a period of abrupt economic dislocation and social disruption. Amidst these historic shifts, USAID helped guide the transition from socialist to market-oriented economies. In most cases, former Soviet republics had to deal with a new economic paradigm when their command economies started to break down, causing people across all walks of life to struggle to understand how markets worked. Some countries gradually introduced market reforms while others simply dismantled the centrally planned economies,

forcing citizens to scramble to adjust and leave the old ways behind. In many cases, officials and citizens found their way by trial and error.

USAID helped bring confidence and stability to these tenuous conditions by introducing new agricultural technology and training, farmer field days and other demonstrations, business development services and market information. Working with former collectives to introduce the notion of producing for markets, rather than quotas—and producing to meet the preferences of more selective consumers—USAID offered guidance to entrepreneurs as they started new businesses, and in some cases provided financing as well. As noted in chapter 1, USAID also helped countries transition from Soviet-style governance by building systems for land tenure and property rights, the foundation for agricultural markets,



Sheep are marked for sale in Killa Saifullah, Pakistan for Eid al Fitr celebrations in 2009.

in Albania and in the former Soviet republics of Kyrgyzstan, Georgia, Moldova and Ukraine.

USAID has also assisted Ethiopia overcome the vestiges of its socialist-styled economic system that had been imposed between 1977 and 1991. Much of the USAID assistance focused on the country's humanitarian needs, but the Agency's work in developing Ethiopian value chains and new markets has yielded impressive results for people involved in the coffee sector, which employs directly or indirectly 25 percent of Ethiopia's 91 million people. USAID's assistance has helped to dramatically expand high-value coffee exports, an expansion that stems from private sector economic reform measures introduced by the current Ethiopian government. One such measure allowed cooperatives to bypass the national auction, previously the only government-sanctioned point of sale for coffee exports, and sell directly to international buyers. The USAID-funded Agricultural Cooperatives in Ethiopia program supported the resulting new coffee value chain, benefiting at least 180,000 small-scale coffee farmers in cooperatives by 2006. Sales of specialty coffee by small-scale farmers through their producers' unions soared from \$270,000 in 2001 to \$31 million within four years and continue to grow. Others in the country's coffee sector are now working to replicate the approach.

CONCLUSIONS

USAID-funded research influenced marketing research and training around the world in areas like coordinating market channels, organizing and

designing marketing systems to accelerate development, setting out economic tasks for marketing boards, diagnosing the political-economic biases of agricultural policies, rationalizing government objectives and reducing regulatory uncertainty, improving contract farming for small farmers, and modeling international trade. Results from this USAID-funded work helped define the entire field of agriculture and food system marketing in developing countries. Years later, others have praised the significant impact of USAID funding and contributing to agricultural marketing policies, practices and literature.

In recent years, USAID has recommitted itself to institutional strengthening and capacity building to make markets work better. Through the years and across a number of initiatives, USAID and its partners have drawn a number of lessons about the nature of markets and their functions and needs in relation to agriculture, the inter-relationships of agricultural and other rural enterprises, and the issues and opportunities of farmer and rural organizations. Much of this knowledge is now second nature for development practitioners.

Small farmers remain a central focus of USAID's support for agriculture. The opportunity of small farmers and rural folk to integrate their operations into emerging national and global marketing chains and add more value to products themselves is a powerful motivation. These opportunities will not materialize, however, without proactive support from the public sector to offer market-facilitating goods, services and institutions.

As seen in Ethiopia, India, East Africa and elsewhere, advocacy for economic reforms that help markets perform better, expand the private sector's role and open new markets present promising opportunities for improving the livelihoods of millions of small-scale farmers. Because many markets are not yet reasonably regulated, adequately supported or integrated into larger markets, USAID's work is unfinished.

Among the key lessons in agricultural and food marketing:

LESSONS LEARNED

- 1. Improving the performance of agricultural and food markets requires an understanding of the many factors that influence markets as a system.** In addition to agricultural production possibilities by location and season, market performance—the ability to match supply and demand—is influenced by a complex array of general economic policies and regulations and their transparency and enforcement; customs, traditions and attitudes towards business; protection of property rights; supporting infrastructure and services; diverse and competing stakeholder interests; the knowledge, aptitudes and practices of market participants; as well as pre-production investments in research, extension and technologies and post-production attention to storage, processing, and increasingly, food safety concerns. A country's openness to international trade also has enormous implications for its domestic markets. Paying attention to one part of the marketing system alone is unlikely to improve overall performance.
- 2. Diagnosing marketing problems and recommending solutions requires a toolkit of different methodologies and approaches.** It is no longer sufficient to “blame the middleman,” for example, without analysis of her position in the market structure, her marketing practices and the outcome for the market as a system. These methodologies measure, among others, ease of entry and exit; levels of concentration and competition; the structure of marketing costs; gross revenues, profit margins, and returns on investments; causes of price variability; degree of market integration and transmission of prices from one market to the next; effectiveness of market risk-management mechanisms; nominal and effective tariff rates; comparative advantage; volumes of trade; and the impact of the commercial-legal regulatory environment. These methodologies can identify constraints in the system that distort incentives, shift investments, or impede progress. Alternatively, these methodologies can measure improvements.
- 3. Clearly delineating the roles of the public and private sector plays to the strengths of each, resulting in better agricultural market performance and higher efficiencies.** The purpose of the public sector is to enable markets to fulfill their critical exchange and coordination functions by providing essential public goods and services that help markets to function better, especially for politically-sensitive items like food. The role

for the private sector is to supply goods and services and add value to them to meet market demand; compete and carry out cost-cutting innovations; expand markets and trade; and reduce the effects of seasonality through storage, processing and transport. In short, the public sector sets the rules and regulations, defines standards and enforces compliance, serving as an impartial referee, while the private sector participates in the game, playing within the rules.

4. **Market-led growth requires a vibrant and competitive private sector. The private sector gets things done.** Under a system of fair, reasonable and transparent policies, regulations and services, and incentives aligned to profit motives, the private sector can undertake marketing operations at greater efficiency and lower cost than public-sector owned enterprises. The discipline of market competition ensures that the private sector will meet market demand in terms of quality, quantity, timing and other specifications. This is all the more critical for time-sensitive agricultural operations, like the seasonal delivery of fertilizers or daily collection and distribution of milk and other dairy products. Moreover, well-performing markets help drive sustainable development through continual upgrading of processes, products and functions as well as coordination with a given sector and between sectors, nationally and globally.
5. **Small farmers and other entrepreneurs are eager, but not always able, to enter and compete in the market on their own.** They face numerous obstacles and need a helping hand. Farmers may have difficulties understanding about new opportunities, obtaining necessary production or packaging inputs, acquiring finance for even low-cost equipment and managing new risks. USAID has linked farmers to markets through support for market information systems, credit programs, improved production processes, training in food quality standards, organization into cooperatives for stronger market position and development of business strategies. Support from USAID has catalyzed the expanding participation of small farmers and rural entrepreneurs in markets around the world.
6. **Switching to state-dominated to market-based economies does not happen overnight.** Formerly socialist economies or economies with heavy state ownership and controls need help in rewriting their laws, rules and regulations for a market economy to operate, as well as new institutions to exercise oversight and fair enforcement. Such a structural transformation usually requires a phased approach to break up state-owned enterprises, strengthen land tenure and property rights, and ensure competition and productivity gains. Those made redundant are likely to need new skills training opportunities and safety net support. The successful structural transformation of agriculture can build confidence for reforms in other sectors.

MARKET INFORMATION FOR FAMINE EARLY WARNING

A remarkable USAID achievement that has developed a range of market monitoring tools comes from the Famine Early Warning System Networks. FEWS NET started in the Sahel in 1985 to monitor nutrition conditions after the African food emergencies in 1983–84 and is now active in Africa, Central America and Haiti and Afghanistan. The FEWS NET story connects satellite imagery, market information and information/communication technology with disaster response. FEWS NET collaborates with international, regional and host country partners to provide comprehensive early warning and vulnerability information on emerging food security threats in about 20 countries.

FEWS NET relies on satellite imagery of geo-referenced estimates of rainfall from the National Oceanic and Atmospheric Administration and similar estimates of vegetation conditions from the National Aeronautics and Space Administration, put into crop forecast and flooding models by the U.S. Geological Survey Eros Data Center. Satellite imagery provides only an approximation of conditions that must be corroborated by observation on the ground. FEWS NET professionals in the field and the United States regularly monitor and analyze weather, markets and trade, and other hazard information, such as locust invasions and plant diseases, in terms of their likely impacts on livelihoods to identify potential threats to food security.

Early warnings allow time for early response and actions to mitigate expected conditions—or example, increased food commodity imports to offset projected crop production declines due to drought.

Market monitoring is a critical component for famine early warning. Households factor market access into their choice of livelihoods—how well they can count on markets as a reliable source of food and as an outlet for the sale of household goods, services and labor. Use of markets for famine early warning requires some predictability of supply and demand patterns and seasonal price ranges from which anomalies can be identified and their causes assessed. USAID, through FEWS NET, has pioneered the use of market signals (such as unusual food price movements, gluts, shortages, and convergence of people) and market disruptions (due to disasters, conflict, or trade embargoes) as early warning indicators of impending food crises and livelihood shocks.

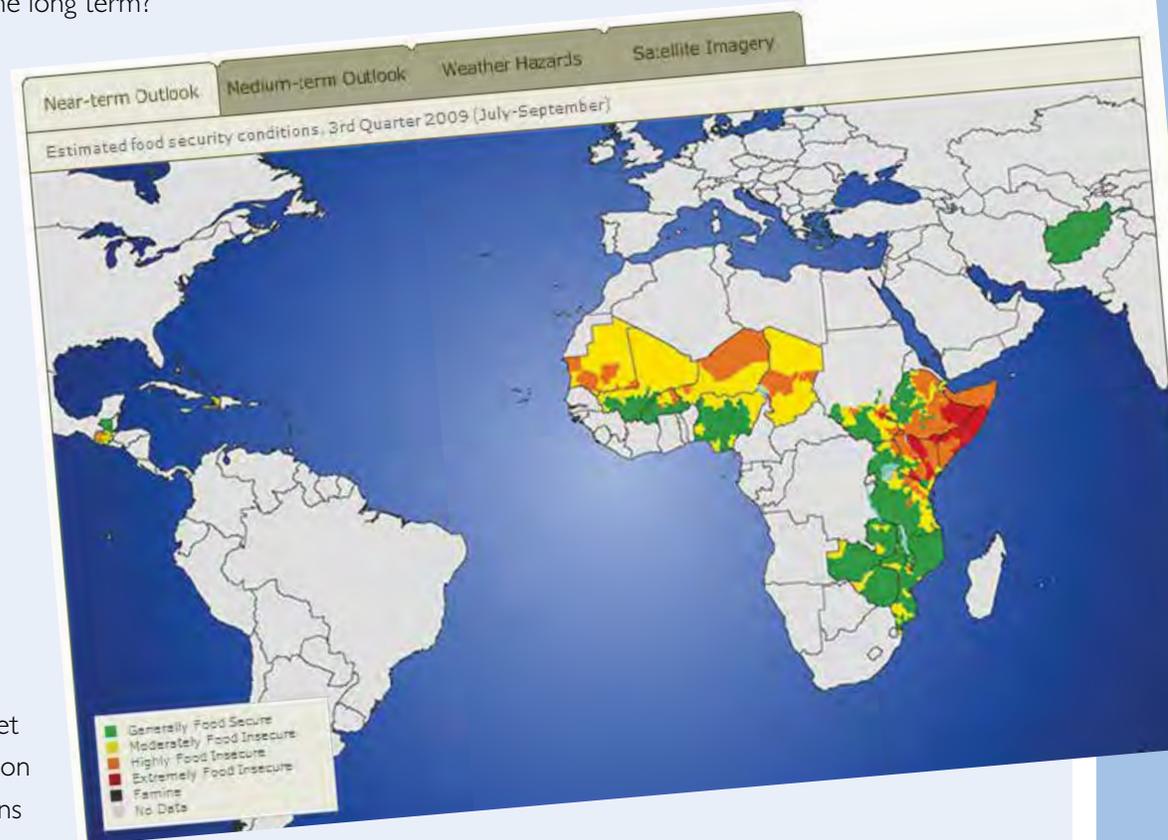
Another indicator is the relation between two prices, or terms of trade—for example, the quantity of millet that can be obtained from the daily wages of an unskilled laborer or from the sale of a two-year

old male sheep. An unusual or unseasonal shift in the terms of trade could portend worsening food security for those whose products and services unexpectedly lose significant value.

FEWS NET also looks at distortions of usual market patterns or policy-induced disruptions to regional and international trade, such as export bans and grain procurement policies.

In its work, FEWS NET considers possible market-based solutions to food insecurity problems. How can food-related interventions be effectively targeted in the short term to the most vulnerable and food insecure through market-friendly mechanisms whenever possible? For whom are market interventions viable in the short run? How can market performance be strengthened to reduce vulnerability over the long term?

FEWS NET pioneered many approaches that have been adopted and adapted by other organizations, such as the WFP/Vulnerability Assessment and Mapping (VAM) unit. The World Bank is using FEWS NET market prices to recalibrate its poverty indices and monitor global commodity prices. FEWS NET remains one of USAID's most trustworthy sources of front-lines market and food security information for the countries and regions it covers.



The Famine Early Warning Systems Network reports on emerging food security conditions related to drought and other climate crises.



BARAT ALI BATOOR/US EMBASSY

FIVE

Financing Farmers and Food Systems

LINKING RURAL PEOPLE AND ORGANIZATIONS TO FINANCIAL SERVICES TO MOBILIZE SAVINGS AND INVESTMENTS

One of the great challenges to people and organizations working with agriculture in developing countries is access to reliable and secure financial services.

A lot of agricultural income tends to be “lumpy,” coming in big amounts but only once or twice a year after the harvest. Other agricultural income is steadier, such as daily sales of eggs or milk or weekly sales of relay-cropped vegetables. In both cases, rural people need a nearby, secure place to deposit their income as savings. And like people elsewhere, rural people need to borrow money. Farmers need credit to buy seasonal agricultural inputs, like seeds and fertilizer, tractor services, or veterinary medicines. Small business people need periodic credit for raw materials, operating and payroll expenses, or new equipment. Rural people need money for routine expenses like food and clothing, annual expenses like school fees, and unexpected expenses like weddings and funerals. Putting the two together—accepting savings and lending out—is what banks do. But financial services are not limited to savings accounts or lending services. They also include insurance, leasing and arrangements for handling remittances from abroad.

Yet, access to these services in rural areas is often limited due to any number of reasons: These include poor roads and long distances to banks in town, institutional weaknesses in the financial system, lack of trained personnel in financial services, reluctance of banks to lend to agriculture, distrust of banks, fears of corruption and

AT LEFT USAID Administrator, Dr. Rajiv Shah, and Afghanistan's Minister of Communications and Information Technology, Amirzai Sangin, test a mobile money application at a ceremony in Kabul.

financial loss—or simple unavailability of finance. As a result, the rural poor and micro, small and medium businesses have historically found themselves frozen out of the financing they need to succeed.

Over the past 50 years, USAID has been a leader addressing this lack of access to rural financing. In testing financial theory against the realities of everyday rural life, the Agency has learned from its experiences in rural finance and has continually adapted its approach to mobilizing rural savings, investment and the power of financial markets to spur economic growth. Five decades of action by USAID have produced three sweeping achievements that have positively impacted the lives of millions of the world’s rural people and businesses.

ACHIEVEMENTS

5.1 LEADING THE SEARCH FOR A NEW PARADIGM IN RURAL FINANCE

For years, the old paradigm for rural finance was based on providing subsidized credit on the presumption that farmers and rural business people could not afford to repay the full interest rate. As it turned out, subsidized credit failed to meet the needs of its intended clientele. Subsequently, USAID led the search for a new model. The Agency’s early efforts sparked an interest among a broad set of researchers and practitioners engaged in finding solutions.

The new paradigm focused on providing financial institutional stability, deposit security and lower transaction costs as a means of

promoting greater access to financing. USAID advanced this new paradigm on several fronts: reforming development banks, creating dynamic credit unions, and forming policy and research groups that explained and defended the benefits of the new approach from those who clung to the old, unsustainable paradigm it replaced.

The Old Paradigm

USAID has long seen the lack of access to credit as a critical barrier to rural development. The success of the Green Revolution in the 1960s and its requirement for purchased inputs and irrigation equipment sparked the expansion of funding for small-farmer low-interest credit programs. In some instances, these credit programs may well have helped spread the Green Revolution and introduce farmers to the notion of formal credit systems. USAID and other donors supported research to improve farm technology and to promote improved crop production and at the same time, operation of new agricultural and rural development banks that offered low-interest loans. Local currency proceeds from P.L. 480 food aid sales were also widely used by USAID to boost the supply of agricultural credit.

But in the late 1960s and early 1970s, USAID evaluations began to spot disturbing trends. Most notably, a landmark evaluation in 1973, the “Spring Review” on Small Farmer Credit, exposed numerous problems with the subsidized credit paradigm. Funds made available for subsidized loans were often siphoned off by social and political insiders as well as large farmers, drying up available credit for small farmers. As a result, fewer and fewer farmers

applied for formal sector loans, opting instead to rely on informal markets for credit, such as traditional moneylenders for agricultural credit, and on family ties for personal loans. Many of the rural households and businesses that did receive formal sector loans enjoyed benefits like production increases or business expansion. But often default rates on subsidized-interest loans were high, threatening the stability of lending institutions. Worse, subsidized credit programs largely failed to meet their intended purpose of stimulating adoption of new technologies, increasing farm production or significantly reducing poverty. USAID responded to these poor results by ending its support of subsidized agricultural lending programs, and along with other donors, began searching for a new model for rural credit.

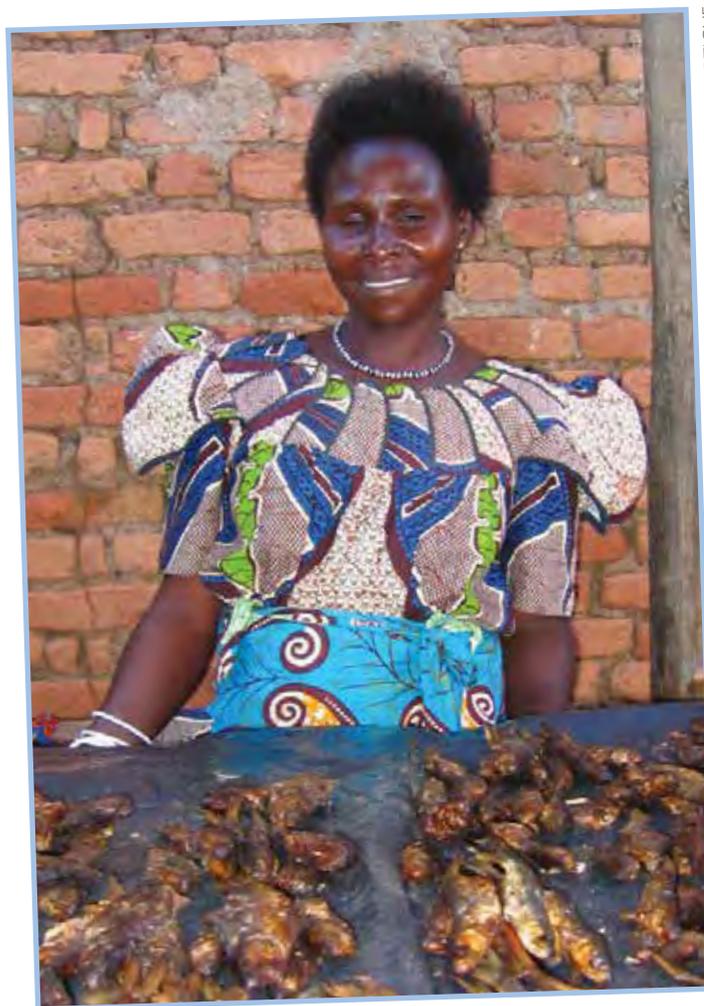
The New Paradigm

USAID supported research, workshops and conferences for the rest of the 1970s revealed that rural farmers and businesses were driven less by low interest rate loans than by assurances that their deposits were secure. This finding thus overturned the conventional wisdom behind the old paradigm, that driving down interest rates through subsidies was the best way to attract rural borrowers.

In 1981, USAID sponsored the Colloquium on Rural Finance in Low-income Countries. It is considered a watershed event in rural lending. The Colloquium highlighted new approaches that focused on developing efficient financial services and using savings deposits to make new loans. The experts overwhelmingly agreed that strong

financial systems depended on locally-generated savings and that market-determined interest rates would attract small-holder deposits and sustain economic growth in the countryside.

At the time of the 1981 Colloquium, USAID had already started down the path of transforming rural finance. In Indonesia, USAID assisted with the rehabilitation of 65 rural offices of a failed rural credit scheme, Badam Kredit Kecamatan (BKK), which led to the reform of the Bank Rakyat Indonesia (BRI). Elements of the new approach included revisions of BRI interest rate



Suzie Cici sells smoked fish at a market in Yei, Southern Sudan after receiving a microenterprise loan.

policies, enhanced employee incentives, and a new emphasis on mobilizing rural savings deposits. The results were outstanding. Deposit levels shot up and the bank ceased to rely on continual donor and government replenishments of funds, instead generating significant profits from its rural units that allowed it to provide financial services to greater numbers of rural people. This early success demonstrated that rural people would embrace saving in banks if offered competitive interest rates under secure conditions.

In 1982, USAID's Experimental Approaches to Rural Savings project (EARS) explored ways of putting new paradigm programs into practice in Honduras, the Dominican Republic, Bangladesh and Niger. EARS found that as long as developing country banks and other institutions could rely on international donors to top up their funds, they had little reason to mobilize savings for loans. By putting in place the right conditions to attract local savings for lending by financial institutions, EARS demonstrated a practical and sustainable alternative to foreign donor funding for low-cost, subsidized loans. In the Agriculture Bank of the Dominican Republic alone, there were 174,000 new depositors. To handle the influx, the bank became astute in dealing with customers and streamlined its data management systems to be able to compete with other financial institutions. As a result, more people received loans, and banks in developing countries began to modernize. With this positive progress, EARS also spawned greater interest in broader economic reform and assisted host countries with these changes.

In the late 1990s, USAID worked alongside the World Bank in Mongolia to provide technical assistance to the state-owned agricultural bank. This joint effort resulted in a ten-fold increase in the number of depositors that laid the groundwork for a strong nationwide branch network that eventually served hundreds of thousands of Mongolians with attractive and dependable services. In 2003, the bank was sold to investors, completing the transformation from government liability to private asset. A similar story unfolded in Guatemala, where USAID-led reform of BANRURAL resulted in a 30-fold increase in lending, a 20-fold increase in savings, and a nearly 10-fold increase in depositors between 1989 and 2009. During 2005–2010, BANRURAL was Guatemala's most profitable bank, able to return substantial funds to the government in the form of taxes and dividends. The success of these efforts and others across the developing world tells a powerful story of the new paradigm that USAID championed.

With USAID support, practitioners of the new paradigm also encouraged use of credit—in cash or in-kind—from input suppliers, processors, buyers and retail traders. Buyers offered credit in exchange for repayment in agricultural products of an agreed quality and quantity. The credit from buyers enabled farmers to purchase production inputs and cultivation services. Offering credit as part of trading relationships helped build client loyalty and mutual interest in successful outcomes. Buyers for supermarket chains used input credit, often coupled with technical advice, to increase

USAID supported income-producing projects, like this village poultry farm in Gia Dinh, South Vietnam, 1971. A market-oriented business approach enabled USAID to finance these projects through loans, not grants.

USAID ARCHIVES



their influence over production processes and to ensure quality and food safety standards.

USAID also encouraged local retail stores to advance funds to farmers during the growing season based on expected income from future harvests. These advances were in the form of goods on credit or loans for other household needs, with credit closely linked to transactions and repayment periods ranging from just a few days to the entire growing season. In lieu of paying interest, farmers might agree to accept a discount on the price they received for their crops. Traders might also require farmers to extend them credit by accepting delayed payments on trader purchases. These reciprocal relationships worked well for both parties: farmers received credit from traders at the start of the season and then provided credit to traders at the end of the season.

The new paradigm established market-based interest rates as a pillar of finance in developing countries. This created market conditions that encouraged a complementary focus on microfinance beginning around 1980. In this sense, the microfinance industry, which has

become a central focus of development efforts worldwide, is rooted in the shift to the new paradigm.

USAID's embrace of microfinance laid the foundation for the modern, effective microfinance system that now reaches more than 150 million people worldwide. The effort also led USAID to increase its support for non-governmental organizations. USAID helped numerous micro-lenders, including FINCA and Accion International in Bolivia, Genesis in Guatemala, Calpia in El Salvador, and K-REP in Kenya start their microfinance programs. Support to the World Council of Credit Unions (WOCCU) in Niger was path-breaking because of its key innovation of linking credit with savings; WOCCU also worked proactively within banking laws to allow formation of credit unions across francophone West Africa. In the late 1980s and early 1990s, the Agency's GEMINI program systematically codified best practices in microfinance and helped establish premier-class microfinance training that continues today. USAID also supported the formation of the Consultative Group to Assist the Poor (CGAP),

housed in the World Bank, to help nurture the growth of the microfinance industry on an even larger scale. CGAP has played an important role in globally disseminating information on the progress of electronic banking in rural areas.

5.2 PIONEERING TECHNOLOGY-LED REDUCTIONS IN TRANSACTION COSTS

A central focus of the new paradigm has been reducing transaction costs on both sides of the ledger: the cost to farmers of doing business with banks and the cost to banks of providing services to farmers. Time and distance between rural areas and financial institutions significantly adds to these costs. The cost of providing rural financial services to geographically-dispersed clients is much more expensive than concentrating businesses in urban centers. Likewise, rural clients usually incur more time and higher transportation costs to access these services than do urban dwellers.

The emergence of new communication technologies capable of eliminating time and travel costs have revolutionized doing business, leading to dramatically better results. USAID has been a leader in promoting the use of new technologies. In 2001 in Nigeria, the Agency piloted the use of smartcards for rural microcredit disbursements and payments that worked so well that VISA bought into it and, over time, developed a combined smartcard/credit card system that is being used widely in that country. VISA also provided an opportunity to improve the variety of financial services provided in rural areas, electronic bill paying and convenient transfer of funds. Two electronic instruments are increasingly providing these new services: bank agents who use point-of-sale technology and cell phones for texting financial transactions.



In Haiti, credit union members display their new biometric ID cards, or cartes-à-puce, designed to facilitate transactions between caisses populaires. For many caisse members, the ID card is the first piece of identification they have ever had.

DAIYVON BAPTISTE

“Since the inception of the project, per capita banking coverage has dramatically improved from one service point per 9,200 persons to approximately one per 4,000. By late 2009, these branchless banks were processing transactions worth approximately \$128 million per month.”

In Uganda, Colombia, Malawi, Peru, Guatemala, Mexico, and Brazil, USAID supported efforts by banks to enlist local businesses (pharmacies, post offices, and grocery stores, for example) to act as mini-bank branches, or “bank agents.” Point-of-sale instruments allow these local businesses to link with main branches to create a far broader network of banking facilities. The most successful adoption of this method has taken place in Brazil, where over the course of just a few years, nearly 100,000 new bank agents now provide financial services to three-quarters of the adult population.

USAID has also encouraged the use of cell phones for branchless banking. In the Philippines, by 2007 nearly two-thirds of the adults in the country had cell phones, but only about a quarter of all adults had a working relationship with a

bank. Through a USAID-supported project launched in the late-1990s known as Microfinance Access to Bank Services (MABS), the number of financial services available to microenterprises through rural private banks expanded significantly. More recently, the project introduced technology that allows customers to use cell phones to conduct financial transactions such as pay bills, sending and receiving remittances, and making deposits. By May 2011, more than 70 rural banks with 1,100 branches were participating in

this electronic system and about 256,000 clients, many of them in rural areas, were benefiting.

Another successful USAID-sponsored branchless-banking activity began in Colombia in 2007. Based on the bank agent model that was so successful in Brazil, in just three years, the USAID project expanded commercial bank service points into rural and other underserved areas. They used a range of different technologies, including smartcards, mobile phones, point-of-sale devices and automated teller machines. Since the inception of the project, per capita banking coverage has dramatically improved from one service point per 9,200 persons to approximately one per 4,000. By late 2009, these branchless banks were processing transactions worth approximately \$128 million per month.

These branchless-banking efforts were part of the larger MIDAS project (2005–10) that focused on improving the performance of financial markets throughout Colombia, especially in rural areas. Early in the life of the project, the Colombian government considered funding a large, new, government-owned development bank, essentially a throwback to the old paradigm. Instead, the MIDAS project influenced the government to consider a market-based approach that was consistent with the new paradigm. This included promoting branchless banking and involving the government-owned bank, Banco Agrario, in the process.

The powerful results of the branchless banking projects in the Philippines and Colombia reinforce the new paradigm and show how banking can be brought to vast numbers of rural people with low transaction costs. In addition, they show that access to deposit services and money-transfer mechanisms are just as important, if not more, than access to loans. This contrasts starkly with the old paradigm's assumption that access to low-interest rate loans was the core need of the rural poor. With nearly 2.7 billion cell phones now in use around the world—representing 2.7 billion potential financial transaction mechanisms, USAID sees enormous opportunity to apply the new paradigm on a broad scale. By the end of 2010, USAID supported 60 mobile banking initiatives worldwide, with another 147 planned.

5.3 PILOTING RISK-REDUCING FINANCIAL MECHANISMS WHILE LEVERAGING ADDITIONAL CAPITAL THROUGH PUBLIC AND PRIVATE PARTNERSHIPS

Uncertain markets with fluctuations in commodity prices, extreme weather, pests and diseases, natural disasters, land title disputes, and other factors have all traditionally made financing agriculture an inherently risky endeavor for banks. Conversely, these same factors often deter farmers, herders and others from entering into financial agreements whose terms and obligations they may not be able to meet.

USAID has found innovative approaches to lower risks in rural financing. It has been piloting new ways of reducing risk in financial processes and leveraging capital through loan guarantees with the Development Credit Authority (DCA), indexed insurance programs, and warehouse receipts collateral systems.

USAID's Development Credit Authority was initiated in 1999 to offer partial loan and bond guarantees to private financial institutions where local access to credit is limited by underdeveloped financial markets and where banks are averse to lending in rural areas. In exchange for bank commitments to offer new loans to underserved sectors, such as agriculture, DCA agreed to guarantee reimbursement of 50 percent of the outstanding loan value, cutting the bank's risk exposure by half. From 1999 to 2010, DCA underwrote loans in a wide variety of development areas—agriculture, small and medium enterprise, microfinance, housing, water, infrastructure, energy, education, communications technology,

health and environment. Borrowers in dozens of countries from Mexico to South Africa and the Philippines benefitted. By the end of 2010, the DCA guarantee authority had mobilized \$2.3 billion in private sector financing for investments across USAID development sectors at a cost to USAID of \$82 million, a leverage ratio of \$28 for every U.S. Government dollar spent by USAID Missions.

USAID research under the Assets and Market Access Collaborative Research Support Program (AMA CRSP) Index Insurance Innovation Initiative (known as I4) found evidence that uninsured risk can create and trap people in poverty and food insecurity, especially among low-wealth agricultural and pastoralist households. In 2008, the I4 used an applied research approach to explore ways to break the risk/poverty cycle. Through a pilot index insurance program in the valley of Pisco, Peru, cotton farmers were offered protection against default for those years in which average valley yields fall below 85 percent of the historic average. The hypothesis of the program was that insurance would increase credit supply by reducing lenders' risk, while encouraging farmers to invest in higher-yield activities and technologies. Based on the encouraging results from the Pisco program, other index insurance options are under consideration in Kenya, Ethiopia, Mali, Bangladesh, Guatemala and Peru.

In pastoralist zones in northern Kenya in 2008–09, USAID-supported researchers found that satellite-based measures of vegetative cover could be used to predict the average livestock mortality experienced by local communities.

Notably, the quality of that prediction is highest for more catastrophic events. Provisional predictions have 85–88 percent accuracy for average livestock losses of 20 percent or more, climbing to 95–98 percent accuracy for average losses of at least 40 percent. A predicted livestock mortality index based on vegetative cover indices was developed as the basis for an indexed insurance contract offered as a supplement to cash-transfer safety net programs. The advantage for both parties is that as poor pasture conditions generally affect everyone within a given area, the satellite imagery of pasture conditions functions as an objective third party “claims adjuster,” precluding the insurer from having to inspect each herd individually to assess losses and obviating the herder from having to make a claim. Awards are paid out based on the predicted mortality index. A broad range of households stand to benefit from this index insurance contract. National insurance companies and international reinsurance companies have shown strong early interest in this new product.

USAID has also supported warehouse receipt lending systems that enable farmers to use stored crops and other products as collateral for loans. Producers are able to secure cash at harvest and sell their products later at a more favorable price. Fees paid to the storage facilities increase the cost of obtaining loans, but the prices that farmers get for products months after harvest often more than makes up for the additional cost.

In 2008, USAID partnered with the African Development Bank to cosign a 10-year, \$20 million partial loan guarantee with CRDB Bank in

Tanzania to encourage pre- and post-harvest lending. Within the first two years of the partnership, \$5 million in credit was approved for agribusiness investments. As a result, borrowers have been able to manage their finances better for the first time in many years, enabling them to pay school fees for their children, upgrade their living conditions, and invest in new farming equipment.

CONCLUSIONS

Progress in reducing poverty, hunger, and other problems affecting the rural poor cannot be advanced without marshaling the underused financial power of agriculture and rural businesspeople and putting their savings and investments to work in the countryside. Expansion of liquidity in the rural economy can catalyze economic growth and development there. Reduction of livelihood-threatening financial losses can be mitigated through indexed insurance mechanisms. A host of other USAID programs have already proven their viability for expanding rural finance, responsibly and sustainably. In short, USAID's work in rural finance has measurably improved the lives of millions throughout the world. However, there is still a great deal of work to be done.

Despite the broad and proven success of the new paradigm, the Agency must continue to expand its understanding, acceptance, and implementation. Calls to resuscitate subsidized credit to deal with agricultural problems in the wake of the 2007–08 commodity price crisis may threaten the remarkable spread of the new paradigm. While some may be tempted to view

subsidized credit as a “quick fix” to get funds into the hands of the rural poor, any short-term benefits could be more than offset by damaging the hard-won gains in building broadly functional financial systems.

Another challenge USAID continues to face is the scarcity in most countries of medium- and long-term loans from \$10,000–100,000—the “missing middle” range of loans for entrepreneurial investors—that are critical to modernizing agriculture production and processing in developing countries. However, agricultural lending can only succeed if it is combined with other factors, particularly an enabling environment for agricultural development and access to markets at all levels.

LESSONS LEARNED

In 2003, a USAID rural finance conference found, given the slow expansion of unsubsidized financial institutions and thin rural financial markets, that the productivity of the rural economy is dampened by three constraints: financial liquidity, savings and risks. Successfully addressing these constraints must consider them together. Promoting rural financial markets, moreover, should be pursued as part of broader financial sector strengthening.

1. **Subsidized credit for agriculture is not sustainable and seldom works as intended.** It distorts choices because funds are not allocated to their most productive uses, fails to stimulate the sustainable adoption of new technologies, and leads to financial rationing and the usual problems when any good or service is rationed:

corruption, crowding out, and capture by those with means to pay, generating enormous institutional inefficiencies and reducing access to formal financial markets by those needed it. Periodic forgiveness of outstanding loans penalizes those who dutifully repaid their credit and discourages the emergence of viable rural agricultural financial systems.

2. **Accumulation of adequate funding for rural and agricultural finance requires competitive interest rates to attract local rural savings and preserve the sustainability of rural financial institutions.** This allows the expansion of credit in all areas for farming, business operations and trade—even microfinance. Putting competitive interest rates into place also helped to ease the transition from socialist to market economies. A close corollary is that gaining the confidence of rural people and businesses requires security of deposits and fairly-implemented banking regulations, including enforcement of credit repayments.
3. **Harnessing new technologies for rural financing—savings, loans and transfers—greatly reduces transactions costs and extends the reach of modern financial services to distant and dispersed rural populations.** In particular, the opportunity for cell phone banking has greatly increased alongside the exponential expansion of cell phone ownership in the past decade. Cell phone applications, such as communication of market prices, enable borrowers to make better informed decisions and thereby manage their credit

finances better. Other banking innovations have also drawn rural people into the formal financial system, such as mobile banking that reduces travel expenses and time away from income-earning opportunities.

4. **Lowering financial risks at multiple levels—banking system, rural enterprises, groups and individuals—builds confidence and opens new opportunities for investment ventures and agricultural value chains, protects farming assets from loss, helps prevent other livelihood-eroding behaviors that trap people in poverty.** USAID continues to expand risk-reducing mechanisms such as bank guarantees for agricultural credits and evaluate pilot programs such as index-based weather-insurance for crops and animals.
5. **Promoting rural financial markets should be pursued as part of financial sector strengthening across the board.** Besides mitigating risk and improving information management, financial sector strengthening includes reforming the legal environment to allow collateralized lending and advocate legal literacy and diversifying financial services and products, such as more loan products tailored to different clientele, deposit insurance and remittance services. Ultimately, a deeper and broadly based rural financial system will create the basis for a financial services ladder on which rural households and businesses can climb as their incomes increase and needs change.



PHILIP STEFFEN

SIX

Appreciating Rural Enterprises

INVESTING IN SMALL AND MEDIUM RURAL AGRICULTURAL ENTERPRISES TO CREATE JOBS, REDUCE WASTE, AND ADD VALUE

While farmers contribute the primary products for rural agricultural value chains, that's neither the beginning nor the end of the story. Seed companies need to produce certified seed. Implement dealers need to sell and service farm machinery. Feed mills need to formulate livestock feed and fertilizer plants need to mix fertilizers. Blacksmiths need to forge plowshares and mechanics need to repair irrigation pumps. Factories need to manufacture milk jugs that can be taken to milk chilling plants for collection and delivery to dairy plants. Someone needs to produce all sorts of containers and packaging to protect products from spoilage and loss during wholesaling and retailing. And so on. If even one link in the long chain “from farm to fork” is weak or broken, rural smallholder farmers can find their profit margins squeezed or even eliminated.

This chapter highlights USAID's efforts to promote rural agricultural enterprises and value chains, strengthen their organizational structures and ensure that these enterprises are dynamic, competitive, capable of upgrading, and oriented to meeting the needs of end markets.

The value chain approach links economic growth to poverty reduction by integrating micro- and small enterprises (MSEs) into increasingly efficient and competitive chains of related goods and services. USAID has recognized that rural enterprise development, in contrast to urban industrialization, is a means to confront problems of seasonally expensive food and seasonal unemployment for the rural majority that, in many developing countries, earns a sizable share of its income from non-farm or off-farm sources. The Agency has made substantial investments in small and medium rural agricultural enterprises, including value chains, to create jobs, reduce losses and waste, add value locally, sustain livelihoods—and thereby deepen and broaden rural

AT LEFT Women sort and grade coffee beans at the SIVCA plant in Burundi.

WHAT ARE “RURAL ENTERPRISES”?

Rural enterprises are economic units of production, processing, marketing or trade—in short, businesses. They can be found at any point along a string of companies or activities stretching from input providers to farmers to processors and distributors that convert basic inputs into products or services for the final consumer, adding value along the way, otherwise known as a value chain. Enterprises may be micro, small, medium or large. They may also be explicitly agricultural or they may involve entities that supply the inputs for farming and/or provide services to rural households. The enterprises may be wholly focused on the domestic market or linked to regional and global markets.

economies. The Agency has also worked with and encouraged private sector food companies to invest in rural areas as a means to ensure reliable sources of supply and take advantage of available labor. These investments have brought opportunities for numerous smallholder farmers to add value to their products and enter new and more profitable markets.

In the past, rural enterprises were rarely able to capture a higher share of the sale prices farther along the value chain, limiting their

ability to turn a profit. USAID’s efforts have helped rural enterprises expand by adding value locally and responding better to end-market demand. Over the years, USAID has generated and disseminated information to inform decisions on market participation, designed and funded studies on how to meet private market standards and their implications for small farmer access to markets, and studied the rapidly growing role of supermarkets in agricultural value chains.

USAID’s work reflects the understanding that high yields and good farming techniques will result in sustained profitability only if farmers are integrated into market-driven value chains. By helping rural enterprises access and fully participate in these value chains, USAID has opened employment opportunities for farming and non-farming rural households and, for those agriculturally-based rural enterprises, transformed legions of small farms into successful and sustainable businesses across the developing world.

ACHIEVEMENTS

USAID’s achievements in supporting rural enterprises have helped create a self-perpetuating cycle of improved productivity, product quality, and farm and rural non-farm incomes.

6.1 EMBRACING THE POWER OF RURAL ENTERPRISES IN AGRICULTURAL DEVELOPMENT

In the 1950s and early 1960s, the prevailing view held that the agricultural sector was full of surplus, low-productivity labor. Green Revolution agronomists sought to improve that productivity

with technological innovations, while agricultural economists applied formal cost surveys to assess financial and economic returns to farm management techniques.

In the 1970s and 1980s, recognizing that farm households seldom carried out a single activity (such as growing sorghum) without considering the cost, seasonality and labor demands of their other activities (such as growing cotton or raising chickens), USAID and other donors supported “farming systems research” (FSR), a research methodology that viewed farming as an integrated system of constrained choices. Experts studied local soils and crop conditions, household consumption and nutrition, off-farm employment options, and seasonal cash flows to understand the overall constraints on farmers’ adoption of new technologies. They also wanted to understand how families allocated resources among activities and within their households, especially between men and women, and how they bridged any gaps. With a better grasp of farming as a system, this method showed promise as a way of improving productivity and increasing incomes in the countryside. Through FSR, farmers were seen as rational, profit-seeking, risk-minimizing managers who applied complex strategies to manage their resources across agricultural and non-agricultural activities in order to sustain their livelihoods.

During the early 1980s, USAID-funded surveys in Sierra Leone, Bangladesh, Egypt, Jamaica, Haiti, Honduras, and Thailand found some surprising results. As much as 86 percent of total manufacturing sector employment and 95 percent of the country’s manufacturing

establishments were small, privately-owned and located in rural areas. During this era of industry-led, urban-based import substitution as the prescribed engine for growth, few experts realized the extent of the rural non-farm industries nor understood how productive these small businesses were. And few knew that women constituted a large part of the rural non-farm workforce. These studies uncovered the presence of a profitable, rural non-farm sector, its role in generating labor-intensive employment, and its efficient use of scarce capital.

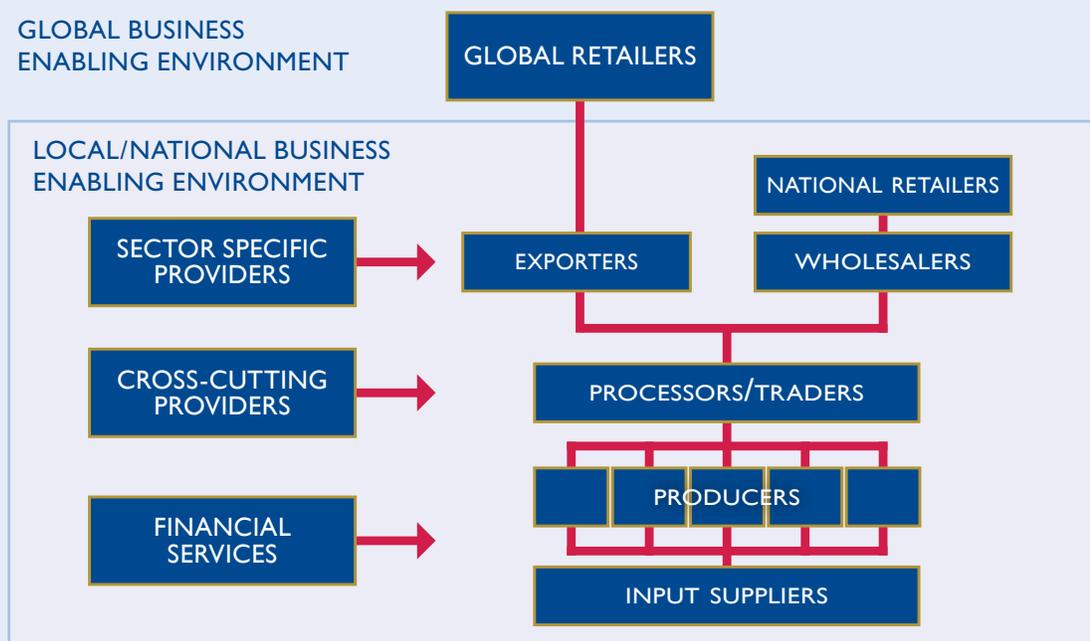
This new understanding underpinned efforts by USAID in the 1980s to support and invest in private, rural agricultural enterprises and the markets that connect them—an approach that some other donors began to emulate only in the 1990s. Gaining confidence over time, USAID paved the way for several decades of business-oriented engagement with agricultural enterprises. An example of how far that approach has come is the More Investment for Sustainable Alternative Development (MIDAS) program in Colombia (2006–10) that redirected agricultural efforts from illegal activities to food crops. MIDAS combined technical assistance and training, organizational and entrepreneurial strengthening, and improving economic governance and competitiveness. MIDAS combined working with existing suppliers, business service providers, and public and private financial institutions to support rural enterprises, creating more than 260,000 jobs in licit rural enterprises. MIDAS strengthened the growth of productive and commercial capacity for more than 10,000 small and medium enterprises while

LINKS IN THE VALUE CHAIN

A value chain encompasses the full range of activities and services to bring a product or service from seed to sale in end markets, where each successive “link” in the chain adds value to the product or service. Thus, a value chain includes input suppliers, producers, processors, traders and buyers, supported by a range of technical, business and financial service providers. Competitiveness is determined by how firms compete and how they collaborate to produce and deliver goods and services more efficiently.

The structure of the value chain end markets, business enabling environment, horizontal and vertical linkages, and cross-cutting support services influences the dynamics of private sector firm behavior. In turn, these dynamics—upgrading of products and services, governance that defines the terms and transactions between links, transfer of information and learning— influence how well the value chain responds to end markets.

COMPONENTS OF AN AGRICULTURAL VALUE CHAIN



promoting the planting of more than 220,000 acres in crops such as cocoa, specialty coffee, oil palm, and fruits, vegetables, and herbs, as well as more than 110,000 acres of newly planted forest land and the conservation of more than 242,000 acres of natural forest. Part of the success of MIDAS is attributed to working with local institutions and enterprises.

6.2 PROMOTING AGRIBUSINESS AND VALUE CHAIN PROJECTS

Beginning in the late-1980s and continuing into the new century USAID shifted its focused toward a number of important areas including a transition within USAID as market support branched off into macroeconomic and trade policies, the regulatory environment, private sector participation, and financing needs for small and medium enterprises, all of which are necessary elements to rural enterprise development and growth.

Perhaps most significant was the Agency's embrace of agribusiness and value chain projects and, over time as consumer tastes evolved and discretionary incomes rose, the shift of focus away from staple food commodities to the production and marketing of higher-value/non-traditional, export-oriented fruits and vegetables, tree crops, oil seeds and other specialty products.

This also spawned a shift in methods and approaches, from clusters (the related goods and services required for multiple, related products) to business development services, including non-financial advisory support, to value chain development and related methodologies. Value

chains focused on the purchasing power of buyers, coinciding with a period of expanding growth and globalization, to provide sustained, market-based demand for a diversity of fresh and processed agricultural products. While value chain analysis first began with the German aid agency, GTZ, and the World Bank, USAID pushed the methodological development of value chains through a succession of value chain implementation mechanisms: Private Investment in Small Capital Enterprises, Assistance to Resource Institutions for Enterprise Support, Growth and Equity through Microenterprise Investment and Institutions, and the Microenterprise Innovation Project. USAID continues to show the way with knowledge management as well as support for public and private sector partnership activities that are adding tools, analyses, idea exchanges and resources to value chain-led development.

USAID's approach to promoting rural enterprises has evolved considerably over the years. The evolution started with "supply chain" projects that focused primarily on the input side of agriculture. Based on USAID-funded university research, Small Enterprise Approaches to Employment (1982–85), that developed the empirical underpinnings of the approach to "sector/sub-sector analysis," USAID applied that approach through the GEMINI project (1989–95) that addressed firm-level, subsector and sector-wide dynamics, and the growth and dynamics of microenterprise programs and institutions.

Through continued review, learning and improvement, USAID's value chain approach

broadened to include improved input supply and higher farm productivity, reduction in post-harvest losses, access to higher-value markets and shifting to high-value crops. In tune with the Agency's commitment to continual improvement of results and an ever-broadening global perspective, USAID's value chain projects increasingly addressed the growing complexity of a global economy affected by gender, human rights and environmental issues, including climate change.

Since 1998, USAID has supported more than 240 agricultural projects focused on value chain development for livestock, staple foods, high-value horticulture, and tree crops such as specialty coffee, investing more than \$4.5 billion across Africa, Asia, Latin America and the Caribbean, Eastern Europe and Central Asia. Significant numbers of the 19 million beneficiaries have been women. Benefits include substantial increases in yields, area cultivated, farm income (\$14 billion) and value added (\$5.553 billion) and on and off-farm employment (1.325 million jobs created). These numbers are before many of the projects have been completed. These agricultural value-chain projects also introduced market-led quality premiums that encourage farmers to grow, harvest, and process crops meeting higher-quality specifications set by commodity buyers or retail food chains with payments above the normal sale price as a reward for producing higher-quality goods.

One of many examples of effectively organizing small-scale farmers to promote rural enterprise is the Agency's work in Malawi. In 1997, after just two years of USAID support of

their organizing efforts, small-scale farmers in Malawi formed the National Smallholder Farmers Association of Malawi. The Association has since "graduated" from USAID support and now provides business and marketing support, as well as community social programs, to its membership of more than 100,000 farm families.

Another example of USAID's work across the value chain can be found in Tanzania. Typically post-harvest food losses can be from 15 up to 50 percent of the entire yield. However, in Tanzania, the USAID-Tanzania Agriculture Productivity Program (TAPP) successfully connected a food processor with farmers in the north-western part of the country to use bruised but otherwise unharmed tomatoes in a line of tomato sauces, chili sauces, baked beans, and several other products. In 2011, the company is set to buy 600 tons of tomatoes from local smallholders. This kind of story is being repeated in country after country through USAID-supported programs.

6.3 BUILDING PUBLIC-PRIVATE STRATEGIC ALLIANCES

Starting in the 1980s, USAID turned to developing public-private partnerships to address problems along the supply chain that limited productivity and profits. These partnerships, which include non-governmental organizations, private companies and foundations, as well as local governments, are instrumental in generating economic growth and solving health and environmental problems. They also help support democracy and increase access to education and technology.

FLOOD AND FLOW: FINANCING RURAL ENTERPRISES THROUGH FOOD AID RUPEES

During the 1960s and 1970s, sales of U.S. PL 480 food aid in India, based on \$8.5 billion in low-interest loans, amassed an enormous amount of non-convertible rupees. (See Supporting Agriculture through Food Aid, immediately following this chapter.) As these rupees had to be spent in India, USAID programmed these rupees in imaginative ways—like helping to jump-start a national network of value chains centered on dairy and edible oil. Proceeds from the sale of food aid powered milk and edible oil helped to spur viable, farmer-owned and managed cooperatives for dairy and edible oil and develop better production and marketing practices that thrive today.

Milk production stagnated and consumption dropped in the early years after independence. The Indian response, “Operation Flood” (1970–96), supported by American and significant European food aid as well as World Bank loans, was the inspiration of the newly created National Dairy Development Board (NDDB). Its chairman solicited food aid to support what was to become the world’s largest dairy development program, also making dairying the largest generator of rural employment.

The U.S. Government provided a one-time donation of 20,000 MT Non-Fat Dry Milk (NFDM) worth \$20 million. The Government’s Indian Dairy Corporation sold the NFDM at prices equivalent to locally-produced milk prices and lent the rupee proceeds to the National Dairy Development Board. These funds were invested in different parts of India’s dairy industry, including construction and expansion of dairy plants, storage and long-distance milk transport facilities, organization of rural milk procurement along cooperative lines, livestock breed improvement, and forage and animal feed productivity. Subsequent shipments of 126,000 metric tons of NFDM by the U.S. through the World Food Program increased milk supplies, stimulated demand and generated more funds for investment. By the end of WFP’s assistance in 1981, \$146 million in local currency had been generated for dairy investment.

By 2002–03 Operation Flood’s 55,000 village-level dairy cooperatives involving almost 10 million farmers—many of them women—were supplying 18 million tons of milk a day, raising per capita consumption of milk from 107 grams per day in 1970 to over 220 grams per day. This figure exceeded 280 grams by

2010–11. Milk production quintupled from 23.3 million metric tons in 1968–69 to 127.3 million MT in 2011–12. Today, India is the world's largest milk producer.

USAID support to the edible oil sector tells a similar story. In the late 1970s, Indian oilseed production had stagnated, requiring large imports to make up the deficit. Oilseed crops were grown on marginal land with low inputs, if any. Inefficient processing and marketing was characterized by high profit margins and speculative practices that exploited growers.

PL 480 came forward to duplicate the Operation Flood experience. A new program, "Operation Golden Flow," began

in 1978 with the provision of 180,000 metric tons of PL 480 soybean oil over five years, valued at \$160 million. The project area included 8,000 villages in six states. Sales of this soybean oil generated rupees to finance oilseed production and support to producers; modern processing plants; research, development and extension services; and marketing of edible oil products through the Dhara brand developed for cooperative oilseed-processing unions. USAID engaged the Cooperative League of the USA to give technical assistance. Today, Dhara is one of the leading brands of the Mother Dairy Corporation, a subsidiary of the NDDDB, with annual sales of Rs. 3,500 million.

The late-1990s marked the low point of USAID's funding for agriculture programs. In response to these challenging conditions, creative USAID personnel compensated for limited internal resources by developing strategic alliances with private sector partners. Such public-private partnerships through the Global Development Alliance furthered USAID's goal of working in and with the private sector and offered the possibility of leveraging badly needed new sources of funds for the Agency's agricultural development work. Since the creation of the GDA model in 2001, USAID has forged more than 1,065 alliances, with more than 3,025 distinct partners. For every \$1 USAID invests, USAID has leveraged an average of approximately \$4 through the private

sector. By 2010, the value of the combined public and private investments from these alliances topped \$9 billion, of which about 20 percent has been focused on agriculture and food security.

One example of these many public-private partnerships is the international confectioner, Olam International, that within the last few years partnered with USAID and two of its own implementing partners starting in Africa and Southeast Asia. By providing training in pest and disease control technologies and good agricultural practices, the alliance helped improve farm productivity and increase the incomes of rural cocoa farmers. In addition, partners provided local farmers with information on the cocoa grading process so that farmers could command higher

prices at local buying units for their crops. Over time, more than 24,600 farmers were trained on cocoa production and gained access to local cocoa buying stations that pay market prices for high-quality cocoa. These steps allowed the farmers to increase yields and improve cocoa earnings by up to 75 percent. As a result of OLAM's successful search to secure reliable sources of cacao powder, OLAM is now engaged with the World Cocoa Foundation global partnership.

Other examples include small farmer fresh produce supplied to Walmart-affiliated supermarkets in Guatemala and Honduras, as well as Fair Trade Certified™ Member's Mark coffee from Brazil sold in more than 600 Sam's Club retail stores (part of the Walmart family of stores). Besides leveraging USAID's limited resources, these partnerships are creating jobs and improving tens of thousands of lives.

Members of the El Gorrión coffee cooperative in Yalí, Nicaragua, watch a demonstration of how the cooperative's new wet mill works. Made up of more than 500 coffee growers, the organization received assistance from USAID to capture some of the specialty coffee market. The cooperative received Fair Trade certification for 1,150 hectares of coffee, boosting business for 309 of its members.



JAN HOWARD

CONCLUSIONS

While the international development community was focused almost exclusively on what happened on the farm, USAID's cutting-edge work vastly expanded the world's focus onto all elements of the agricultural value chain, from seed to market. The Agency's leadership in the 1970s in researching socioeconomic conditions expanded the knowledge frontier of rural non-farm enterprise activity around the globe and helped to catalyze rural economic growth. More recently, USAID's willingness to embrace collaboration with private agribusiness companies proved enormously successful, energizing transformative and ongoing work in areas such as small-farmer and microenterprise development and commercialization of agriculture in lower- and middle-income as well as former Eastern bloc countries.

As a result of these sustained efforts, USAID has been a leader in advancing of private sector

approaches to agricultural development and the development of strategies to help farmers diversify their portfolios, move into high-value, non-traditional crops, and access quality premiums in the marketplace. The OECD recently recognized USAID as the best among its peers when it comes to private sector engagement.

To help overcome the discouraging conditions that propel rural-to-urban migration, USAID's efforts can increase agricultural growth and diversify the rural economy through rural-based enterprises and broader market participation. Through its own investments and in partnership with others, USAID seeks to empower the energies and aspirations of rural people while making rural areas a desirable place to live and build a future.

LESSONS LEARNED

As USAID moves forward, lessons learned over the last five decades by pioneers in the field of rural enterprise development bear remembering.

1. **Rural sectors in developing countries** around the globe harbor dynamic, rational, profit-seeking rural entrepreneurs who allocate their land, labor, and capital resources to maximize their returns in agriculture and outside of agriculture to ensure the best livelihoods for them and their families. They **often need help**

linking to outside markets and value chains in order to accelerate their growth.

2. **When afforded new opportunities to supply markets beyond their villages or beyond their borders, these farm and nonfarm producers are generally eager to respond to new incentives.**
3. **Rural enterprise initiatives can result in production of more staple foods for domestic consumption and foods, beverages, and non-food agricultural products for export.** Increased incomes allow producers to buy more and better-quality food and other consumption goods as well as meet other household needs.
4. **Private sector partners may be better motivated to access new sources of farm supply when seed funds from USAID are made available to establish new supplier networks.** USAID funds help to cover the cost of farmer outreach, product identification, supplier aggregation, training in grades and standards, and other services. Without USAID support, these costs could represent sufficiently high risk to discourage a company from attempting such rural and agricultural investments.

SUPPORTING AGRICULTURE THROUGH FOOD AID

The contribution of food aid to USAID's legacy in agricultural development reflects the long history of the Agricultural Trade Development and Assistance Act (Public Law 480) of 1954, predating USAID, with its multiple objectives of export promotion, humanitarian relief, and agricultural and economic development. This act was renamed the Food for Peace Act in 2008.

USAID successes in promoting—and propelling—agricultural productivity growth in East Asia and then South Asia have brought basic food security for large numbers of people and provided the initial stimulus for economic growth and development. Many countries that received U.S. food aid in the early years of PL 480 have become self-sufficient or even food exporters and international donors themselves.

American food aid has usually fallen into one of three categories: humanitarian relief from disasters, conflict or complex emergencies (grants); project food aid for implementing development activities (grants); and program food aid providing balance of payments support to recipient governments (loans). A good part of project and program food aid is often “monetized,” or sold through authorized channels in the recipient countries, to cover implementation costs.

FOOD AID LOAN PROGRAMS: Although government-to-government food aid loan agreements have fallen out of use, they were once significant. Concessional-term loan agreements (subsidized interest rates and extended repayment periods of up to 40 years) through PL 480 Title I or III helped countries with foreign exchange shortages while developing markets for American products. These food aid commodities were sold on the market and the sales proceeds in local currencies were in a counterpart funds account for use in development. The value of these sales proceeds was enormous. Between FY 1955 and FY 1968, commodity sales agreements generated the equivalent of \$11.5 billion in local currencies—in rupees (India, Nepal and Pakistan), pesos (Bolivia, Colombia and Philippines), lira (Israel and Turkey), pounds (Egypt and Sudan) and other currencies. In FY 1988 alone, the market sales of American food aid generated the equivalent of \$657 million in local currencies in 45 countries.

By agreement with USAID, these local currencies were programmed for development projects, budgetary support, sector investments or policy reforms—such as dairy pricing reforms in Jamaica or promotion of the private sector in food markets in Bangladesh. As another example, from 1952 to

1972, USAID and its predecessor agencies contracted six land-grant universities to help the Government of India develop eight agricultural universities, partly financed by \$11 million in U.S.-owned food aid rupees (chapter 3).

USAID influence over the use of local currencies depended on reaching agreement with the recipient government about its development priorities and ideological objectives, as well as the skills and initiatives of the USAID Mission and sometimes, the sway of the local agricultural sector. Reaching agreement on programming these local currencies and exercising financial controls and accountability was not always easy, and sometimes a source of friction with the recipient government, but the impacts are often still felt today in terms of infrastructure developed, persons trained, or policies reformed.

FOOD AID GRANT PROGRAMS: While food aid loan programs have diminished, emergency and development uses of Title II grants have increased. Congress sets a mandatory program level to be used for development. The balance of resources is used to respond to emergency food aid needs—on average, about 80 percent of Title II resources—or programmed according to other legislative requirements, such as program monitoring or early warning. The UN World Food Program is USAID’s biggest emergency response partner. On average, contributions from all U.S. resources (including USDA commodities, State Department funding for refugees and other USAID funding for development and foreign disasters) account for some 40 percent of the resources programmed by the WFP, allowing it to respond to food crises globally. Starting in 2006, both emergency and development activities use a single Strategic Objective, food insecurity in vulnerable populations reduced.



USAID ARCHIVES

USAID used Food for Work projects, such as this one in Indonesia, to employ people to improve agricultural productivity through installing dikes and canals for better water management.

In addition to WFP, USAID's Food for Peace Office works with many non-governmental and private voluntary organizations, known as "cooperating sponsors," to carry out both emergency and development programs. Development programs implemented by these organizations improve lives through better agriculture, health and education systems and economic growth overall. The experience and expertise of these cooperating sponsors ensure that food goes to those who genuinely need it and help the poor improve their circumstances and escape chronic hunger. The process to select cooperating sponsors is rigorous and renewal of selection is not automatic.

Title II development food assistance programs usually run for three to five years. Multi-year program activities that target the chronically food insecure and that include long-term safety nets in addition to human capacity, livelihood strengthening, and community resilience activities are funded with development funds. Resources can be reprogrammed and or emergency resources can be added in event of a disaster. The costs of internal transport, shipping and handling are funded independently from program costs and more funds are now available for program management, monitoring and evaluation.

Development resources focus on a select number of priority countries. Sectoral guidance for developing proposals may include:

- » *agricultural production (showing farmers better ways sow and tend their fields or providing improved seed, thus improving their harvest by linking them with American knowhow, or encouraging the production of higher value commodities that earns money in local markets); and*
- » *preventing chronic malnutrition in children under two years of age (teaching women about nutrition, resulting in healthier babies and children, and providing micronutrients, such as vitamin A, iodine, zinc, and iron, that hungry children often lack) as well as other sectors, like education, water and sanitation, and HIV/AIDS.*

USAID agricultural officers evaluate proposals from a technical perspective to help the Office of Food for Peace make its awards.

Food aid grant programs are paying more attention to agriculture. A 2002 review of the Title II agricultural portfolio between FY 1996 and FY 2001 found a "dramatic" shift from activities with an indirect relationship to agriculture, such as road rehabilitation and reforestation, to a "heavy emphasis on agricultural production and more post-harvest, marketing, and agriculture-based microenterprise components."

Direct comparison across development programs was not possible, but by and large, Title II development projects did well for two impact indicators, increasing crop yields and reducing losses in storage. Other indicators achieved mixed results—increasing household income, dietary diversity, and production value; closing the food gap; and reducing soil erosion. The review found a basic balance between the process indicators “mostly achieved” (such as numbers of farmers adopting any improved

TITLE II DEVELOPMENT PROGRAM RESULTS

Food for Peace development food assistance programs:

- » *in the Democratic Republic of the Congo repaired 16 kilometers of irrigation canal and 27 kilometers of feeder roads. This allowed an increase from one to three crop cycles per year, resulting in an increase of median annual income by 42 percent for agriculture co-operative members.*
- » *in Sierra Leone increased yields by 77 percent for cassava, 66 percent for lowland rice, and 65 percent for vegetable production across program areas.*
- » *in Ethiopia, increased average household asset values 20 percent and increased food self-sufficiency 29 percent across the 750,000 individuals helped by USAID between 2005 and 2010. Also in Ethiopia, families eat more types of food—an additional 1.5 food groups—and could provide enough food to feed their families for almost 2 months longer in 2010 than in 2005.*
- » *in Malawi disseminated irrigation, conservation agriculture techniques and cheaper and more readily available manure to fertilize crops. This has increased yields by 2–300 percent, increasing incomes for farmers and their families. In the 2011 marketing season, farmers groups sold new crops such as pigeon peas, birdseye peas, chilies, rice, sesame and cow peas for more than 34 million Malawi Kwacha—the equivalent of almost \$129,000 in new income.*
- » *in Madagascar trained 50,000 farmers since 2010, nearly half of whom are women. Some farmers have increased their yields by 400 percent using technologies and seeds promoted by the program.*
- » *in Bolivia worked with farmers to diversify into high-value crops with a clear focus on market-driven value chains. By the end of four development programs in 2008, farmers had doubled their income, or more. Across the programs, the value of sales through forward contracts and producers associations shot up from just \$30,000 in 2002 to almost \$1.6 million in 2008. Recent follow-up visits indicate the gains made during the Title II programs have been largely sustained.*

Title II development program partners organize training for farmers to observe new production technologies as well as the variety of crops that are able to grow in the region. These learning opportunities often change attitudes and behaviors among farmers who replicate what they have seen in their own plots, improving their productivity.

SHARE/GUATEMALA



practice) and those “often unachieved” (such as numbers of farmers adopting a specific cultural practice). A new evaluation covering the past five fiscal years will be able to shed new light on progress made over the decade.

According to seasoned food aid officers, the real story is that awardees used Title II food aid commodities to reach marginalized and underserved communities for which selection criteria centered on poverty and malnutrition. Awardees have successfully integrated poor, less technically-viable producers into agricultural value chains and demonstrated that even in the worst circumstances, development outcomes were possible and that livelihoods and food production could be strengthened, even in emergencies. Some recent programming innovations included early adoption of plant breeding as a development activity and use of cell phone-based e-vouchers to obtain food aid in Haiti.

While a Mission's agricultural program often works in geographic areas of a country where there is potential for agricultural growth, the food aid program generally works in marginal agricultural areas where food needs are greatest. The geographic areas of Food for Peace and Development Assistance funded activities do not always overlap, but in Feed the Future focus countries, there has been a push to align food aid and other assistance in the same geographic zone of influence, where feasible, to achieve synergistic effects and greater impact.

EVOLVING FOOD AID: Over the years, the food aid program has made continuous adjustments within response to changing needs, budget constraints, charges by critics, and the quest for efficiency and professionalism of food aid management. Food aid has diminished as a portion of global aid flows in the past 50 years but still provides vital, life-saving assistance in humanitarian emergencies.

Food aid is no longer a surplus disposal program as in its first decade because reforms of farm legislation in the 1980s and 1990s no longer generate surpluses for donation, and government stockpiles are near zero. In addition, the overseas market development programs through Title I and III have declined in importance and funding; the relationship between food aid commodity prices and American farmer incomes is minor.

Many of the criticisms of food aid depend on the market context in the recipient country. The charge that food aid creates dependency through production and marketing disincentives has been blunted by the 1985 “Bellmon analysis” legislation that requires USAID to certify that American food aid will not have a significant disincentive on local production or marketing, as well as greater USAID sensitivity to seasonality of local production and consumer preferences. The Consultative Sub-Committee on Surplus Disposal of the 1967 Food AID Convention monitors food aid levels to see they do not displace a country’s usual commercial imports. Additionally, the use of food aid as an explicit export subsidy was banned by the 1986 Food Aid Convention, a prohibition that was strengthened by the Uruguay Round Agreement on Agriculture. Starting in 2008, Food for Peace has contracted out this Bellmon analysis to an objective, third party to ensure that the results are rigorous and unbiased; in the event that this disincentive analysis finds that the local market cannot absorb a given volume of food aid commodity sales, programs are approved within acceptable levels or substitute funding may be available.

As an in-kind resource, food aid is both a consumption good and a resource transfer with different benefits to recipients and impacts on markets, depending how it is used. In-kind food aid may not always be appropriate and monetizing food aid may not be efficient. This has prompted calls for less cumbersome cash transfers and or food vouchers when local food supplies are available and when the main cause of food insecurity is lack of purchasing power. In these cases, procurement of food commodities locally or regionally can save time and money.

The Farm Bill for 2008, spelling out the terms for the Food for Peace program, opens the door for local procurement. The Farm Bill authorized \$60 million for Local and Regional Procurement through USDA, including pilot procurement programs of emergency and non-emergency food in FY 2010 and FY 2011 to be evaluated in FY 2012.

The contribution of Title III food aid loan programs for agriculture has been considerable and took on greater prominence during the years of low budgets for agricultural development in the 1990s and even later when funding for agriculture began to rebound in the 2000s. Food aid-funded programs promoting better agriculture and natural resources management reached \$152.2 million in FY 2003 (compared with \$745 million in non-food aid Development Assistance for agriculture) and \$125.6 million in FY 2009 (\$639 million), or equivalent to roughly 20 percent.

The Farm Bill of 1991 made improving the food security of low-income developing countries the over-riding goal of the food aid program, a welcomed emphasis. Within this goal, continuing attention needs to be given to the link between food aid needs, agricultural development, and trade options that increase food availability and expand food access. As the Feed the Future initiative argues, a comprehensive approach is required on multiple fronts, through country-led processes and partnerships, to overcome the root causes of hunger and food insecurity.



SEVEN

Getting Policies Right

DEVELOPING INFORMED AGRICULTURAL AND FOOD POLICY AND GROWTH-ENABLING ENVIRONMENTS

The dusty fields where smallholder farmers labor to grow their produce and sustain their families may seem like a world away from the capital city offices of the developing world's policymakers. But what happens in one place clearly influences the other. Production, consumption, demand, prices, politics and other factors can combine to hobble national economies, cause widespread suffering—or bring about equitable access to a reliable bounty of food.

One of the underlying premises of the United States Government's Feed the Future initiative was that the world and carelessly neglected investments in agricultural research and productivity-enhancing technologies since the Green Revolution breakthroughs—and needed to quickly catch up. Liberalized and expanded global agricultural trade, as discussed in the next chapter, was the recommended policy prescription until the food price crisis of 2007–08, when some producer countries banned exports and caused importing countries to lose confidence in global food markets.

Well-functioning economies, and the agricultural economy, require stable and predictable macroeconomic policies within which people can plan and invest with reasonable assurance. At the microeconomic level, helpful rules and incentives are required to encourage productivity growth and enable all sectors to prosper. Policies define the mandate of an economy's core institutions and determine the reliability and efficiency of its infrastructure—transportation, communications and financial—that connects rural and urban areas. By defining the structure of economic incentives and opportunities, policies, rules and regulations greatly influence how, when and where people allocate their resources—between consumption and investment, for example, or which crops to plant or whether to market their hogs now or later. Policies may support agricultural and food systems research, education and extension that increase productivity and innovation, as well as protect consumers. Policies reflect how well

AT LEFT Sound policy formulation takes into account the views of those affected. Women in Kasai Oriental Province participate in civic and voter education prior to national elections in the Democratic Republic of the Congo.

WHAT IS POLICY & WHAT DOES IT DO?

In simple terms, policy involves a cohesive set of basic principles that guide government decisions beyond the short term. Policy research and analysis evaluates the impact and effectiveness of existing policies compared with their intended objectives, and develops projections to identify the likely consequences and costs of policy choices.

a country takes care of its poor, vulnerable and food insecure citizens through social protection programs and productive safety nets.

Putting the right policies in place can make all the difference in a country's growth trajectory, as Chile's experience shows. USAID (and its predecessors) and private foundations funded a student and faculty exchange program, 1955-64, between the University of Chicago and the Catholic University of Chile. Other American universities also accepted Chilean students. Well schooled in classical liberal economics favoring market- and trade-oriented policies, these Chilean students and faculty rose to positions of influence in the mid-1970s. They were instrumental in implementing free market reforms that helped tame inflation, turn the stagnating economy around, and lay the foundations for Chile to become competitive in the global economy. Price-fixing marketing boards were shut down, property

rights strengthened, import tariffs reduced, and wages gradually freed. Incentives were put in place to attract private investment in agricultural research, particularly for high-quality exports. Value addition for all crops and livestock increased by more than 10 percent per year for more than two decades. These and similar policies led to an economic take-off: Per capita incomes more than doubled between 1973 and 1995 and rural poverty fell from 50 percent in 1987 to 23 percent in 2000. Chile and the U.S. signed a Free Trade Agreement in 2003 that, among other products, has boosted Chilean exports of wine, grapes and other fresh fruit to the States.

Policies in some countries, however, are not conducive to investment, innovation or competition. Poorly conceived and biased policies, enacted in the absence of good governance and due process, lead to an environment characterized by low levels of trust in institutions and markets; weak enforcement of contracts; asymmetrical political relations between groups, regions and sectors; unfavorable business climates and heavy-handed regulations; and negative attitudes toward entrepreneurship. The results are pervasive risk and uncertainty that raise transaction costs—including the cost of food and other necessities. Rather than reducing hunger and poverty, poor policies exacerbate these conditions.

The nuts and bolts of the policy process rarely make the news. Tangible impacts, because they can take years and even decades to be seen, often prove difficult to identify. But USAID and its partners have long recognized the critical importance of getting policies right and helping

developing nations build their own capacities for making sound policy decisions.

USAID's policy work has helped developing countries better understand the role of agriculture in economic development. Initially, the Agency addressed agriculture policy only indirectly.

The new realities brought about by the Green Revolution in the 1960s elevated the importance of agricultural policy research, analysis and formulation followed by implementation. In the 1970s, USAID started supporting agricultural planning and policy through projects designed to build capacity in national institutions by training host country nationals in collecting and analyzing statistics, carrying out cost-benefit analyses, simulating financial and trade impacts, and conducting social soundness analyses.

In the 1980s, the Agency adopted a new approach that sought to motivate sector-wide policy reforms. In return for progress on specific reforms, USAID frequently provided funding or food aid to host countries under U.S. Public Law 480. Under certain conditions, recipient countries could sell the food commodities and use the sales proceeds for agreed economic development investments and projects. Non-project assistance (NPA) became a major vehicle for USAID at this time. In Niger, for example, two large Agricultural Sector Development Grants (ASDG I and ASDG II) were conditioned on extensive policy reforms. A third activity, the Niger Economic Policy Reform Program (NEPRP), also worked on some agricultural sector policy issues.

In the 1990s, policy programs and projects increased in Africa and decreased in Asia and

the Middle East. Today, USAID supports policy research, analysis and training everywhere, especially its applications for food security and agricultural development.

ACHIEVEMENTS

For a half-century, USAID support for policy research and analysis has helped developing countries improve their ability to ask the right questions, find the right answers, and get policies right. In many countries, these joint efforts have helped change countless lives for the better.

7.1 IMPROVING DEVELOPING COUNTRY CAPACITY, AND QUALITY OF AGRICULTURAL POLICY RESEARCH TO FACILITATE POSITIVE CHANGES.

One of the central objectives to USAID's support for universities, IFPRI and its agricultural policy analysis projects, is to strengthen the internal capacity for agricultural policy research and formulation within developing countries.

In Africa, USAID agricultural policy work centered on Mali, Mozambique and Zambia, as well as continuing university activities in Senegal, Malawi, Rwanda, Ethiopia, Kenya, Southern Africa's Common Market for Eastern and Southern Africa, and the Economic Community of West Africa's Agricultural Policy.

From 1984 through 2006 with USAID support, 69 Africans received masters' degrees in agricultural sciences, while 41 received Ph.D.s in economics and agricultural economics. Many went to work on African development through international and regional organizations, most

frequently in their home countries. Hundreds of Africans have received in-service training as research assistants. And in almost every African country, land grant university graduates occupy key teaching, research, public service and other positions. USAID-funded training continues to influence policy development in Africa.

In West Africa, assistance to host country policy makers resulted in the liberalization of grain markets and a better understanding of the complementary roles of the public and private sectors; more public-supported market services; better systems to warn of food insecurity, and drought preparedness. USAID's efforts in food and agricultural market policy analysis attempted to understand and correct market distortions so that prices reflect their true scarcity values for better informed investment decisions, leading to economic growth.

Mali and Senegal offer exceptional examples of the results of capacity building.

The market reform process in Mali demonstrates the interplay of policy change and market opening supported by market information. In 1981, the government agreed with donors on a policy reform (known by its French acronym, PRMC) to boost domestic grain production by increasing producer and consumer prices and by liberalizing the grain trade and improving the operating efficiency of the government grain-marketing agency. Proceeds from the sale of multi-donor food aid provided funding, augmented by the promise of financial support in years when food aid was not needed. The results over the next two decades were impressive:

increased competition, lowered costs of grain distribution, reduced government budget deficits incurred by the old marketing system and improved availability of grains. Once convinced the reforms were permanent, grain traders invested substantially in their own marketing networks and infrastructure. Market information changed farmers' bargaining power with traders and further integrated markets, facilitating the flow of food staples from surplus-producing to deficit areas.

In addition, USAID capacity building and policy advocacy in Mali contributed to creation of a sub-sector economics unit (ECOFIL) within the national agricultural research institute (IER), and strengthening of the Food Security Commissariat. These efforts were greatly boosted by the succession of Food Security Cooperative Agreements implemented by Michigan State University in Mali since 1985 (and elsewhere in Africa). Results from Food Security market-based research, carried out jointly with the Food Security Commissariat, provided the empirical analysis underlying much of the policy debate.

The Mali market reform process also shows the value of "staying the course." The Mali market reforms supported better planning and drought response. Cooperation improved with the well-established market information system and with a track record of government-trader community alliances.

Since 2003, USAID has sought to improve lives and protect resources in southeastern Senegal through the new Wula Nafaa program promoting conservation, poverty reduction and good



Addressing flood-affected farmers at a USAID gathering in Khyber Pakhtunkhwa, Pakistan.

governance using the Nature, Wealth and Power approach, discussed in chapter 9.

In Egypt, modern economic policy reform began in the agricultural sector in the mid-1980s. Major vehicles for reform were the USAID-supported Agricultural Production and Credit Project and later, the Agricultural Policy Reform Program. The Production and Credit Project started the policy reform process by focusing mostly on agricultural production. The Policy Reform Program extended the efforts to marketing, exports, opening public-sector ventures to development by private companies, agricultural support services, irrigation management, food security and related areas. USAID has also provided support, as highlighted in chapter 6, for export efforts of the country's horticultural industry.

Indonesia, Bangladesh and India serve as outstanding examples of USAID's contributions to policy research and implementation capacity building.

In Indonesia, USAID's relationship with economic policy makers has roots in academic, private foundations, and its own capacity-building

efforts that go back 50 years. With funding from the Agency, development contractors and academic institutions collaborated with senior Indonesian colleagues to conduct policy research and analysis and to train generations of Indonesians. The Stanford Food Research Institute played a major role—working with the many Indonesian agricultural economists who got their Ph.D. training in the U.S.

From 1998 to 2004, American analysts with USAID support worked with Indonesian researchers, analysts and policy makers to produce policy briefs on key topics for discussion and review. Analysts also developed tools for assessing policy impacts and benefits. Training and research involved more than 100 faculty members from 40 universities across the vast archipelago. USAID funded much of the analysis that supported a successful rice price stabilization program in Indonesia and spurred the development of Indonesia's massive grain logistics system. As a result of these interventions, even the poorest of Indonesian irrigated rice farmers tripled their incomes.

In Bangladesh, USAID has funded IFPRI agricultural policy research and analysis for more than 30 years. Programs undertaken with USAID support included: The Bangladesh Food Policy Project (1989–1994), comprehensive evaluations of food-assisted programs for the poor, including

the country's food supply management system; flood impacts on household food security, modifications to government tender procedures for procuring food grains; and impacts of the Food for Education program. Other efforts in Bangladesh include analysis of the operational performance of

BENEFITS OF USAID-SUPPORTED POLICY WORK

USAID-supported programs in policy development:

- » *Removed the regressive head tax, the “per person” tax originally imposed by colonial powers in West Africa, benefiting many rural households.*
- » *Assessed price policy effects for their impact on production incentives, as well as their influence on rural household incomes and wage rates, and decisions about food consumption, especially for poorer rural households that rely on food purchases and off-farm work.*
- » *Created and strengthened market information systems to guide production and marketing decisions, boost competition, and moderate price volatility between seasons and locations.*
- » *Assisted local communities in Mali in developing their own food security plans.*
- » *Brought about basic changes in market regulations in Eastern and Southern Africa to allow private traders to buy grain and allow small hammer mills to compete with industrial mills, providing opportunities for employment and for low-income consumers.*
- » *Removed restrictions in Zimbabwe on intra-regional grain trade, lowering cereal prices for grain-deficient households. Removed trade barriers for livestock, onions and cereals across West Africa.*
- » *Worked for policy reforms that allowed the development and strengthening of cooperatives and credit and savings groups in Africa.*
- » *Promoted policy reforms that empowered farmers to manage their own irrigation systems and allow natural regeneration of trees in cultivated fields.*
- » *Advocated for land tenure and resources access security around the world, particularly in Eastern Europe and parts of the former Soviet Union.*
- » *Recognized that successful analysis takes time, reliable data and access to previous studies, local expertise and collaboration, as well as formal and informal training to expand the pool of qualified analysts.*

programs supported by food aid and a study on the role of food- and cash-based safety net programs in improving the food security of the ultra-poor. Still other programs analyzed the potential for dairy value chains to increase livelihoods of smallholder producers and nutritional research to influence the policy environment for fighting child under-nutrition.

In India, perhaps USAID's greatest impact came in the negotiation on massive food-aid deliveries in the mid-1960s. India had experienced back-to-back unprecedented droughts that reduced food production by 10 percent below pre-drought levels. The United States provided 10 million tons of food aid, coming with conditions set by President Johnson, who had significant foreign policy differences with India's Prime Minister Gandhi. The bitterness associated with the U.S. policies emboldened Prime Minister Gandhi to determine that India would never again be beholden to a foreign power for something as dear as food. India supported agricultural production as a first priority of its development efforts.

USAID also contributed to efforts in India by participating in professional policy discourse. During the late 1960s, USAID conducted its own policy research and analysis in India, publishing papers that fed an active economic policy debate within the country. The USAID Mission in India also took part in an ongoing dialogue and information exchange with Indian professionals. The Mission's analysis showed that chemical fertilizers accounted for the largest part of Green Revolution production increases. As a result of the policy discussions, India invested in factories

needed to supply the fertilizer needed to sustain the Green Revolution.

USAID participated in initial discussions to establish the Food Corporation of India to implement India's food price support, food distribution, and price stabilization schemes. And the Agency contributed to India's agricultural policy planning exercises and made significant financial and technical contributions to India's rural electrification program.

7.2 DEVELOPING GLOBAL CAPACITY TO WORK ON AGRICULTURE AND FOOD POLICY.

USAID has a long, productive history of not only conducting its own agricultural research, but also supporting and training partners to carry out their own policy work.

With USAID funding, U.S. universities established research and training programs in a variety of fields related to agricultural development, including policy research and development. After President Harry S. Truman announced his Point Four program for technical assistance abroad in 1949, John Hannah, then president of both Michigan State University and the Land Grant College Association (and later USAID Administrator), proposed using the resources of land grant universities and colleges to help solve problems of developing countries. That began more than 60 years of USAID-funded international development work on the campuses of America's land grant colleges and universities. Over the years, USAID further strengthened the linkage between U.S. universities and national

SAHEL DEVELOPMENT PROGRAM: POLICY AND INSTITUTIONAL REFORMS FOR RECOVERY

The Sahel Development Program was as much about a genuine consultative process as the policy reforms and development programs it brought about.

Several consecutive years of severe drought across the semi-arid Sahelian belt in West Africa in the early 1970s devastated crops, decimated cattle and other livestock, and displaced 8-10 million people from their homes in search of emergency support. Tens of thousands may have died from starvation and related diseases.

The most striking lesson of the crisis was how well Sahelians had managed their survival. The Sahelian countries (Cape Verde, Chad, Gambia, Guinea Bissau, Mali, Mauritania, Niger, Senegal, and Upper Volta, now Burkina Faso) organized a regional organization, CILSS, to combat the effects of the drought, mobilize their own regional efforts and reach out to donors for recovery assistance. A massive outpouring ensued of millions of tons of food, medication and shelter supplies. This dramatic response, however, could not alone address the region's underlying vulnerability to variable rainfall patterns.

A group of donors decided to help the Sahelians find long-term, comprehensive solutions to enhance regional resilience. Two senior USAID officials, the Assistant Administrator for Africa and the former Deputy Administrator, were instrumental in enlisting the Agency to join forces with CILSS in planning a long-term food security strategy. Unlike most international development efforts measured in annual increments, the Sahel Development Program was charted as a generational program for over 20 years, funded by special legislation by the U.S. Congress starting in 1973 and supported by constant efforts of France, Canada and later nine other European countries, coordinated by the USAID-supported Club du Sahel and in partnership with the CILSS.

Soil and water conservation measures: Joint planning teams of Sahelians and non-African experts worked on agricultural programs based on small, village-based irrigation and erosion control systems, including the planting of thousands of kilometers of wind breaks and short-maturing varieties of millet, sorghum and maize. Traditional and modern technologies were applied to conserve rainfall and soil moisture while restoring soil fertility. AGRHYMET was

created in 1974 as a specialized agency of the CILSS to improve natural resources management through remote sensing and training in agro-climatology and hydrology.

Policy reforms: Another joint working group, supported by USAID-funded universities, engaged in years of policy analysis and dialogue to reverse some of the economic and marketing policy failures that compounded the drought's effects. This dialogue led to extensive market reforms that opened up grain trading to private traders, expanded access to information and gradually removed the heavy hand of government price controls. The CILSS wrote a Food Aid Charter in 1990 to manage the needs analysis, delivery and coordination of food aid in a transparent manner. Cross-border and export trade was dramatically enhanced by the devaluation of the West African Franc (CFA) in 1994.

Twenty-five years later, an independent evaluation found that the Sahelian countries have successfully overcome variability in rainfall, and their crop and animal production systems have proven dependable. CILSS and its institutions, as well as some joint working groups, continue to function. The Sahel was the first region in Africa to adopt an agricultural-led approach to poverty reduction and to demonstrate that environmental rehabilitation could be the underpinning for long-term development.

The Sahel Development Program was created as 20-year moral contract, linking the leading industrial nations and some of the world's poorest countries, based upon a deep mutual respect for all partners with sharing of roles and responsibilities. In all practical ways, it was African-led.

agricultural research systems. Universities and land grant college faculty built long-term relationships with USAID for collaborative arrangements on policy research, training, and capacity building.

In 1962, Harvard University founded the USAID-funded Development Advisory Service to work in a wide range of developing countries. Twelve years later, it was renamed the Harvard Institute of International Development, which became home to many distinguished fellows and tenured faculty. Modeled after the Harvard institute, the University of Michigan's Center for

Research on Economic Development became a center of excellence in Francophone West Africa in the 1970s and 1980s.

At Stanford University, the Food Research Institute began to gather, analyze and publish information on food production, trade, prices and consumption as early as 1921. USAID-supported research training for researchers on food policy continued until 1996.

USAID also established international alliances for capacity-building and research. In 1975, the Agency began core funding for the newly-founded

International Food Policy Research Institute (IFPRI), one of the 15 international agricultural research centers operating under the Consultative Group on International Agricultural Research (CGIAR). The Agency has maintained close links with IFPRI from the beginning. A former USAID chief economist was IFPRI's first Director General, and USAID has been IFPRI's largest donor throughout the institute's history. IFPRI has grown considerably since its early days, now employing more than 100 professionals at its Washington, D.C. headquarters and offices in Bangladesh, China, Ethiopia, Ghana, India, Italy, Nigeria, Senegal, and Uganda.

After its establishment, IFPRI quickly overcame the challenge of mistrust of official data on the world food situation and future projections among many in developing countries. The institute came to be known as an authority and leader in the field of agricultural research, producing a range of published papers and country studies.

Another major USAID effort involved a series of Agricultural Policy Analysis Projects, known as APAPs. Supported by USAID field missions, APAPs worked with host countries to institutionalize the policy analysis process by increasing capacity and creating local demand for better analysis of economic policies affecting agriculture. Three successive APAP projects between 1981 and 1999, led by distinguished agricultural policy experts, studied a broad range of agriculture-related issues and built the abilities of host governments to carry out rigorous policy analyses, formulate policy options and determine their effects on agriculture. In Niger, APAP carried

“Mali reduced the percentage of its population that is undernourished from 27 percent in 1990–92 to less than 10 percent in 2007 ...”

out important parallel work to the CRED-led ASDG-I program.

In recent decades, USAID funding helped American and foreign graduate research assistants to carry out country-developed, long-term applied food security research programs. These efforts worked within partner country Ministry of Agriculture policy analysis units or semi-public food security research units to build their capabilities and reach out to key stakeholders to discuss the results, thereby building critical constituencies for reform.

Calculating the rates of return on policy changes presents a number of challenges. However, USAID can point to a number of clear examples of success in countries where the Agency has assisted in agricultural policy development. For example:

- » Mali reduced its undernourished population from 27 percent in 1990–92 to less than 10 percent in 2007 by entering into a decades-long engagement with donors, known as the Cereals Market Restructuring Program (or PRMC), to liberalize the marketing of basic cereal staples, improving access to market

information and decentralizing food security programming to the district level.

- » Bangladesh has instituted major positive agricultural policy reforms in public food distribution and food price stabilization. In the mid-1990s, the country eliminated restrictions on the import of small pumps, which within a decade, irrigated millions of acres of land previously lying fallow half of the year during the dry season, helping the country to produce enough rice to meet its needs.
- » From 1967–1997, rice production in Indonesia increased by four times, helping to fuel high and sustained economic growth. Also during that timeframe, the share of undernourished population was cut to one fourth (6 percent) of the pre-Green Revolution level.
- » In India, wheat production increased by six times and rice increased by two and a half times, while in just two decades the proportion of undernourished shrank from 38 percent to 21 percent. New environmental policy issues have emerged, in India as in Bangladesh, about lowering water tables and increasing arsenic in the water.
- » Whereas in the 1970s there were more than a dozen countries in Latin America and the Caribbean that qualified for non-emergency food aid, now there are only two.

CONCLUSIONS

In developing policy research and analysis capacity to inform policy decisions, USAID's

work has benefitted numerous countries and countless people. Without generations of trained, capable agricultural economists, sociologists, anthropologists, political scientists and other professionals, the Agency's policy and capacity building work in its first 50 years would have been nearly impossible. And it may not have been as successful. As evidence of that success, many larger countries in Latin America and Asia have critical masses of trained and experienced professionals—they no longer need the outside assistance that they once depended upon. However, for many smaller and poorer countries, there is yet a need to build capacity for a new generation of agriculturalists to sustain progress towards reduction of poverty and undernutrition.

In the past, applying the Agency's research and analysis expertise to agricultural and food policy problems required sustained support from U.S. academic institutions and the active participation of host governments. Looking forward, private firms, tapping the skills of academics, consultants and other policy analysts, will likely play an increasingly central role, especially those from the countries or regional associations in question, part of USAID's project implementation and procurement reforms known as "Local Solutions."

In many cases, empirical policy analysis has replaced prejudices and conventional wisdom in decision-making. Impacts of this policy analysis will go well beyond the agriculture sector to improve incomes and living conditions throughout the economy.

LESSONS LEARNED

1. **Good policies require good research and analysis.** Because each circumstance is different, research and analysis must be specifically tailored to the historical and institutional context, technical possibilities, and current political economy of any given situation.
2. **Good policy advice must be balanced and inclusive.** There is no safeguard or guarantee that policy advice will recognize the needs of all stakeholders. When conflicts between participants arise, it is critical that analysts have a reputation for fairness and a willingness to communicate the consequences of different courses of action.
3. **Good policies are a powerful catalyst for successful development.** While sound policy making is not enough to guarantee a positive difference, it is proven time and again to be a critical element. Good policies did not cause the Green Revolution, but they were necessary to support successful implementation and management of improved agricultural technologies and practices. This pattern of supporting complementary and necessary policy reforms can be found throughout USAID's work.
4. **Policy advice is most effective when the donor or funding agency, the country's government leadership and structures, and the people of the country are in basic alignment.** An example would be assistance, including cash and food aid, to strengthen social safety nets for the poor and vulnerable at times of high food prices as well as marketing policy adjustments to improve agricultural markets as part of ongoing economic policy reforms.
5. **A major advantage of university involvement in policy research is the capacity to make recommendations based on objective, critical thinking.** If research and analysis are combined with multiple levels of university training, such as short courses and U.S. degree programs, their longevity can provide faculty continuity and institutional memory, as seen by the MSU and Harvard/Stanford experiences. The International Food Policy Research Institute also operates under a policy of peer review of its publications and advice.
6. **Private firms that conduct policy research are often able to draw on a wide range of expertise and respond promptly.** The APAP approach, combining the "best and the brightest" from a range of academic institutions and private firms, managed by a private firm with a strong group of professionals, may be the very model to overcome some of the limitations of academic departmental boundaries.
7. **USAID must have in-house competence in agricultural policy analysis if it is to successfully negotiate assistance with recipient countries and manage policy-focused contracts and grants.** Wholesale outsourcing of policy analysis to consulting firms and universities has significant limitations. USAID needs to be guided by its own strong internal analysis.

A PICK-ME-UP FOR RURAL ECONOMIES

Specialty coffee sippers can't taste it, but that first cup of eye-opening Arabica coffee may well contain a little bit of USAID.

USAID has supported producers and markets around the world as demand for specialty coffee steadily grows in the United States, Europe and Japan. Coffee drinkers' changing tastes have made high-quality specialty coffees an essential part of the day for many people. Statistics on specialty coffee consumption are hard to come by, but USAID reported in 2005 that global demand was growing by 1.5 percent a year. Other sources say 150 million Americans drink coffee every day, including about 30 million who drink specialty coffee beverages.

Properly grown, marketed, processed and graded coffee to ensure it retains its quality characteristics, specialty coffee varieties can help growers get many times the price of lower-quality Robusta coffee. The higher price for Arabica and other specialty coffees raises household incomes for producers, employees and other farm and non-farm rural industry workers. USAID has assisted small-scale coffee growers in about 30 countries in Latin America, Africa and Asia to produce and sell gourmet coffees. The Agency is also creating market information systems so local growers can get accurate price information.

In Central America, USAID is credited with saving the coffee business there in the 1990s by supporting and encouraging farmers' efforts to grow and prepare for shipment high-value specialty coffee exports when a global coffee surplus sent the region's coffee growing industry into a death spiral. The industry recovered by focusing on high-quality—and often organic-grown—beans.

USAID also helps to expand access to credit and to promote a favorable policy environment. Among the countries where USAID is working with coffee specialty industries are Ethiopia, Kenya, Tanzania, Uganda, Rwanda, Bolivia, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Indonesia, Nicaragua, the Dominican Republic, Panama, Peru, Yemen, and East Timor.

USAID's specialty coffee program in Ethiopia, the birthplace of Arabica coffee, is one of the Agency's most successful. Restrictive policies of the former Ethiopia military regime nearly destroyed the

country's coffee export industry. The government at the time required growers to sell only to Ethiopian "collectors," who then sold to buyers. The buyers in turn sold coffee through government-sanctioned national auctions to government-recognized Ethiopian exporters. Only then were international coffee companies allowed into the picture; they could buy coffee only from the exporters. The complex system drove many growers out of business.

But in 2001, the government finally allowed producers to bypass the auctions and sell directly to international buyers. About that time, USAID funded a program to develop local coffee cooperatives. As a result, between 2001 and 2005, sales of specialty coffee by small-scale producers unions grew from \$270,000 to \$31.9 million, benefitting 180,000 cooperative households. Others in the coffee sector have shown interest in adopting the Ethiopian model.

Rwanda presents another telling example of USAID's work in developing countries with specialty coffee industries. USAID has been the principle supporter of technical assistance, training and financial support to the country's coffee sector. Since 2001, Rwanda has emerged from nowhere as a leading specialty coffee provider to U.S. and European specialty roasters and retail chains. The specialty market has helped nearly 50,000 Rwandan households double their incomes from 2004 to 2008 and has created 4,000 jobs at coffee washing stations where freshly picked coffee "cherries" are prepared for market.

USAID's efforts have helped improve value chain management for small farmers and link specialty coffee producers with buyers "from the seed to the cup."

Women sort coffee beans at a USAID-assisted processing facility in Ethiopia, where USAID is working with local farmers to increase specialty coffee production and sales.





ANGELA RUCKER

EIGHT

Expanding Agricultural Trade Opportunities

EXPANDING GLOBAL AND REGIONAL AGRICULTURAL TRADE OPPORTUNITIES THROUGH TRADE LIBERALIZATION AND REGIONAL TRADING ORGANIZATIONS, AND ENSURING FOOD QUALITY AND SAFETY TO ENSURE COMPLIANCE WITH IMPORTER STANDARDS

In many developing countries, unfamiliarity with the dynamics of international trade markets and lack of negotiating skills can restrict trade opportunities and limit opportunities for profit. Since the 1970s, USAID has helped partner countries build their capacity to analyze impacts of trade policy and understand the potential economic benefits to be gained from trade liberalization. As a result, many countries actively participate in increasingly integrated global and regional agricultural trade systems.

A prime illustration can be seen in Egypt, where the fruit and vegetable export trade idled in neutral for decades, with the values of these exports averaging just \$150 million a year 1975 to 2002. Egyptian agro-processors and large-scale growers had capital to invest, but they needed the right techniques and know-how to expand production and productivity and improve access to external markets.

USAID provided technical support by giving growers and agro-processors extensive training in business and management. They applied the training to their own enterprises. As market opportunities emerged, USAID supported the blossoming horticulture industry and a related exporters' association. Next, the Agency focused on helping smallholders participate in the markets.

Remarkable things began to happen. By 2008, the value of Egypt's fruit and vegetable exports had risen dramatically to \$1 billion a year. Today, Egypt is the third largest African exporter of fresh fruits and vegetables.

Egypt has benefited from a rich partnership with USAID for more than 30 years. Agricultural development has been a longstanding priority for this country of 80 million people, where arable land comprises barely 3 percent of its territory. Given this limitation, there was no easy fix to Egypt's challenges. Progress came after decades of support for programs in infrastructure, research, technology development, policy reform, and

AT LEFT USAID'S Export Promotion Program has assisted many Salvadoran family-run businesses by allowing them to expand to markets in countries throughout the region and U.S. supermarkets.

competitiveness. USAID's promotion of trade-led growth through support for non-traditional agricultural exports contributed significantly to increased incomes and opportunities for the Egyptian people.

This accomplishment demonstrates the qualities common to most USAID's programs—leadership, vision, pragmatism and a willingness to adapt again and again to meet new challenges.

ACHIEVEMENTS

USAID has long placed a high priority on the expansion of global and regional agricultural trade through trade liberalization, compliance with food quality and safety standards, and development of regional trading organizations. Among the Agency accomplishments, the following five stand out.

8.1 BUILDING CAPACITY TO ANALYZE TRADE OPPORTUNITIES

In the 1960s, developing countries concentrated on traditional primary commodity exports, and food self-sufficiency was the mantra for many. But after the commodity price crash in the mid-1970s following food and fuel price spikes, many countries were financially insolvent by the 1980s. Analysts began to question whether food self-sufficiency still made economic sense.

The developing world needed tools that would allow countries to assess the benefits of specializing in particular foods, agricultural commodities and other goods for which they enjoyed a comparative advantage, coupled with reliance on regional and global markets for imports of less expensive basic food commodities. USAID pioneered the creation and adaptation of economic tools and carried out

WHAT IT REALLY TAKES FOR TRADE CAPACITY BUILDING

Foreshadowing what is today referred to as a “whole-of-government” approach, USAID collaborated in Morocco with the U.S. Department of Agriculture (USDA) in the Planning, Economics, and Statistics for Agriculture (PESA) Project. Active between 1983 and 1993, PESA provided technical assistance to the Ministry of Agriculture and Agrarian Reform (MARA). Through the introduction of new information technologies, long-term graduate training in the United States, long-term resident advisors in the Ministry, and short-term technical assistance and training, PESA transformed the Ministry's ability to collect and provide timely agricultural statistics, prepare agricultural economic policy analysis for national decision makers, and evaluate agricultural projects. These outputs greatly enhanced the Ministry's role in national and international economic policy making, trade negotiations, and, ultimately, its capacity to evaluate the impact of various trade policy alternatives.

applied research to test and recommend trade options for countries and regional groups.

USAID values the application of cutting-edge research methods to help developing countries to analyze trade issues; estimate measures of efficiency and policy-related transfers to and from governments, producers and consumers through use of a tool called the Policy Analysis Matrix (PAM); understand aggregate and disaggregated gender impacts of trade liberalization on employment, wages, savings, investment and economic growth; and examine legal, institutional and trade obstacles through the Agricultural Commercial Legal and Institutional Reform (AgCLIR) tool.

The Agency's early support for applied research and analysis provided a precedent later on for

building up host country capacities to analyze the possible gains from trade and their political-economic ramifications. In addition, USAID developed an approach that emphasizes developing a knowledge base and competencies in trade analysis as part of trade capacity building (TCB).

In West Africa and Indonesia, USAID-supported research to analyze the political economy of rice policy. The analyses revealed distortions caused by government intervention in rice markets and trade, contributing to later debates on agricultural sector reform in five West African countries and Indonesia in the 1980s and 1990s. In addition, training of local policy analysts through efforts funded by USAID and the World Bank spread understanding and adoption

TABLE I: TRADE FREEDOM INDEX OF TOP 10 TCB RECIPIENTS

COUNTRY	U.S. TCB ASSISTANCE, 1999-2009 (\$ MILLION)	TRADE FREEDOM INDEX	
		1996	2011
AFGHANISTAN	716.4	N/A	N/A
TANZANIA	622.6	53.8	69.6
MOROCCO	613.0	59.0	75.8
EGYPT	579.0	25.0	74.0
EL SALVADOR	486.5	73.0	85.0
BURKINA FASO	401.3	55.0	76.2
GEORGIA	387.8	69.0	89.2
GHANA	353.0	31.2	67.8
COLOMBIA	302.7	65.0	73.2
MOZAMBIQUE	298.5	75.0	81.0

Source: USAID TCB database and Heritage Foundation

of value-chains long before the term ‘value chain’ came into common use in development circles.

One way to look at the impact of trade capacity building assistance is to gauge the evolution of an independent composite measure that incorporates the trade-weighted average tariff rate and non-tariff barriers. For the top 10 country recipients of U.S. TCB assistance, the evolution of the Trade Freedom Index between 1996 and 2011 is presented in Table 1. An average improvement of more than 17 points is noted for the nine countries for which indices are available.

As the liberalization of trade began to take effect, USAID used its tools to help developing countries understand international trade in the new world of globalization and helped ease them into it confidently and efficiently. Many countries have pursued trade liberalization themselves, and moved closer to the trade-led, broad-based economic growth that USAID envisioned for them.

8.2 BUILDING NATIONAL CAPACITY TO NEGOTIATE, COMPLY WITH AND BENEFIT FROM TRADE AGREEMENTS.

For farmers and non-farm producers alike, globalization opened the prospect of better access to foreign markets, higher incomes and economic growth. But developing country producers needed the means to take advantage of globalization.

USAID has taken a systemic approach to trade capacity building assistance. The Agency has offered a range of programs to improve access to multilateral trade discussions; promote regional integration and regional trade capacity building; and negotiate bilateral trade agreements. In

many instances, USAID’s trade capacity-building programs focus on trade policy, infrastructure, institutions, and processes, without explicitly focusing on food and agricultural trade. This general approach spreads the trade benefits across all sectors. In other instances, USAID has focused on agricultural aspects of free-trade agreements or promotion of food and agricultural products specifically.

Beginning in the 1980s, USAID promoted regional integration of agricultural markets in Sub-Saharan Africa. The Agency also supported bilateral capacity building for trade in countries in Central America and the Caribbean. Around the same time, Central American countries began seeking better access to foreign markets for farmers and non-farm producers. A range of programs have helped developing countries like these benefit from globalization. Free Trade Agreement negotiations put development issues on the table. Because of the importance of these countries’ exports, even technical assistance on general trade-related issues benefits agricultural development significantly and helps their agricultural sectors adjust to new marketing opportunities.

As the Uruguay Round (1986–94) of trade negotiations under the General Agreement on Tariffs and Trade wrapped up and the World Trade Organization came into being in 1995, the demand among developing countries for information on trade agreements, preferential arrangements, and trade-related skills increased substantially. However, by 2001, the developing world showed skepticism about the benefits of efforts at trade liberalization because most did not

have the capacity to evaluate the possible economic impact of various trade policy options.

From 2001–2007, USAID’s first generation of trade capacity building focused on strengthening developing countries’ understanding of multilateral commitments they had made in global trade negotiations. The Agency’s Trade Capacity Building Activities Project also sought to build awareness among developing countries of the opportunities and challenges presented by free trade agreements and preferential trade arrangements. The ongoing Worldwide Support for TCB project known as “TCBoost” is further enhancing USAID’s reputation as a thought leader and premier TCB practitioner.

Some of the longer-term benefits of USAID bilateral TCB support are still unfolding but are nonetheless expected to be significant. For example, when formal Free Trade Agreement (FTA) negotiations with the United States began in 2003, a decade after the conclusion of USAID/Morocco’s TCB project, agricultural negotiations on the Moroccan side were guided by a team of Moroccan economists who were U.S.-trained with USAID support. Negotiations resulted in a win-win outcome for both countries. Morocco gained a more flexible trade deal with the United States, with provisions for the phased reduction of Moroccan import tariffs on wheat, beef, and poultry to ease the adjustment burden on local producers. At the same time, U.S. feed grain exporters gained accelerated access to the Moroccan market. Groups such as the U.S. Grains Council have in turn contributed to modernization of Morocco’s poultry value chain, which develops

demand for U.S. corn as feed. Today, modern slaughtering and cold chain facilities exist in major Moroccan cities once dominated by artisanal slaughtering facilities. As the poultry chain modernizes, the price of poultry meat is declining significantly, benefiting consumers and fostering diversified diets.

Similar stories can be told about USAID support before, during, and after FTA negotiations in Colombia. From 2003–2006, USAID’s Creating Conditions for Economic Revitalization (CRECER) Project helped Colombia anticipate the possible impacts and growth effects of an FTA with the United States through modeling by U.S. and Colombian economists. The debate over the model and its conclusions contributed to greater Colombian support for the FTA.

FTA signatures are typically motivated by the prospect of improved market access into the partner country. However, in the case of the CAFTA-DR (2004), Central America and Caribbean countries already enjoyed preferential access into the U.S. market through the Caribbean Basin Economic Recovery Act (2000). Rather than improved access, the impetus for the six Central American and Caribbean countries to negotiate CAFTA was to attract investment, upgrade to a permanent trade framework and benefit from technical assistance offered by the U.S. government to improve their competitiveness that would expand regional trade with the United States. For the first time in an FTA negotiation, development issues had a seat at the FTA table.

These negotiations led to the establishment of the Trade Capacity Building Committee,



At the Food Inspection Center in Aqaba, Jordan, Areej Omari uses the new system to check on the threat level of new food imports.

ASEZA

co-chaired by the Office of the U.S. Trade Representative (USTR) and USAID. The committee focused on aligning trade and development objectives. Each country developed a national action plan for TCB. Three countries in Central America and the Caribbean—Guatemala, Haiti, and Honduras—are now participants in the U.S. Government’s Feed the Future initiative, building on a trade-led agricultural diversification strategy implemented by USAID in the 2000s.

USAID is currently evaluating regional and bilateral programs to support trade compliance in the CAFTA-DR countries. Though not directly attributable to USAID trade capacity-building assistance, the agreement has proven its worth to CAFTA partners in terms of trade stability. The six countries appear to have weathered the global economic recession better than others. Whereas the value of all global imports into the United States fell 9 percent between 2008 and 2010,

the value of imports from the six CAFTA-DR countries grew 22.8 percent. Food and agricultural imports have more than doubled in fifteen years, largely due to strengthened compliance with international food standards and regulations.

8.3 STRENGTHENING COMPLIANCE WITH INTERNATIONAL FOOD STANDARDS AND REGULATIONS

The growing international demand for specialty agricultural products—including high-value, off-season, fair trade, and organic food—creates an opportunity for developing countries. But to take advantage of it, producers must be equipped to meet private agrifood industry standards as well as public and international regulations. Private standards set by retailers or wholesale buyers may include definitions of quality, safety, traceability, labor, and environmental indicators.

USAID has supported work on food safety standards through many different contracting

and cooperating mechanisms, using other Government departments and agencies, private sector partnerships and global and regional organizations. To draw on specialized USDA expertise, for instance, USAID now covers the cost of several USDA advisors, one in Central America, and one in each of three sub-Saharan African regional offices.

Another outgrowth of work by USAID in the past 15 years to help developing country exporters comply with the standards and regulations concerning food safety has been the development of professional food safety competency frameworks and training programs. As part of the CAFTA-DR Sanitary and Phytosanitary Trade Capacity Building Program, funded by USAID and managed by USDA, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and the Dominican Republic use a “Harmonized Regulation on Microbiological Residue Standards for Food.” The standards set maximum residue levels in food and provide a regulatory framework outlining the steps that food exporters must take to meet international standards. Detentions and outright rejections of food exports due to labeling infractions have decreased significantly for the region overall because of demonstrated compliance with U.S. regulations. USAID-supported efforts now also offer independent training programs directly to public and private sector food industry clients around the globe. Food industry companies, such as Coca-Cola in China, and retailers, such as Metro in Egypt and Ukraine, along with public groups such

as APEC and UNIDO, are buying into these training services, making them more viable.

Under the USAID-supported Rural Agricultural Incomes and Sustainable Environment contracting mechanism known as RAISE-Plus, a consortium built sanitary and phytosanitary capacity in developing countries; helped countries to develop certification and accreditation bodies; and supported the further development of modern supply chains linking small farmers and supermarkets. In 2005, the RAISE mandate was expanded to address the avian influenza outbreak. Demonstrating USAID’s willingness to rapidly respond to emerging global issues, RAISE has since worked in more than 30 countries and helped to establish USAID as a global leader in this area.

USAID was an early proponent of the “lead firms” approach—larger companies that take the lead in complying with food standards and then show smaller companies around them how to do the same—to improve compliance with food standards in a particular sector. A forthcoming World Bank comparative analysis of such programs involving African smallholder farmers notes that the dominant factor for success was adoption of “lead firms.” While other donors preferred a bottom-up or Small and Medium Enterprise approach to value chain development, those same donors credit USAID for its embrace of lead firms in value chains, an approach to which many of them came around to 10 to 15 years later. Now, as domestic markets for middle class consumers grow, a spectrum of regulatory and market requirements is emerging in food systems

around the world. This offers myriad opportunities for smallholders and the donors who support them to take more achievable steps toward improving the quality and safety of their crops and livestock products.

To support the public role in maintaining and expanding access to global food markets, many of USAID's trade and agribusiness projects now incorporate food safety components. The crosscutting nature of these projects typically involves interests from the agriculture, industry, trade, and human and animal health, and public and private sector. When the stakes are highest, as in confronting the threat of pandemic diseases to rural enterprises and agricultural trade, USAID has again led in forging multi-agency, multi-organization, and multi-faceted approaches to prediction, prevention, preparation, and response.

8.4. DEVELOPING A MULTIFACETED APPROACH FOR PREVENTING, MONITORING, AND CONTAINING PANDEMIC, ZOOBOTIC DISEASE THREATS

Zoonotic diseases are health threats that originate in animals and can be transferred to humans. In 1997, the highly pathogenic H5N1 avian influenza (AI) virus emerged as a global zoonotic health threat. Not only did the H5N1 virus pose a threat to human health, it threatened to disrupt poultry production around the globe and posed a significant challenge to rural and commercial poultry industries and to regional and international trade.

Cross-border trade in live poultry and poultry products is common—and with it the risk of

the spread of avian influenza. A 2003 USAID assessment noted that the occurrence of avian influenza in Guatemala in 2000 led to trade disruptions with Honduras and El Salvador. International and bilateral donor organizations ramped up their programs to help countries prepare. USAID's sanitary-phytosanitary avian influenza program included national training workshops and assessments, national plans for national avian influenza prevention and preparedness, and a global study of vaccine effectiveness.

USAID also launched several activities, including the Stamping Out Pandemic and Avian Influenza, or STOP AI, project that operated from 2007 to 2011. STOP AI's innovative approaches to working with local partners recognized the implications that avian influenza presented for animal health, human health, education, animal husbandry, rural development, economic growth, and trade dimensions. STOP AI worked in 49 countries and trained more than 15,000 participants.

The Agency assisted in formulating national response plans and surveillance systems for detection of early outbreaks, rapid response procedures (containment, testing, culling, coordination across sectors, and public communications), biosecurity improvements with participation from private sector poultry interests, and value chain upgrades.

To minimize losses from the disease, the project worked with breeders, hatcheries, feed mills, private farms, slaughterhouses, veterinarians and live-bird market vendors, veterinarians, public health officials, community development

personnel, teachers, and government agencies. USAID's efforts on avian influenza have served as a model for avoiding prospective future zoonotic health crises. There hasn't been a major human health outbreak in more than two years and USAID continues in the forefront with its Emerging Pandemic Threats multi-disciplinary programs.

8.5 PROMOTING TRADE-LED GROWTH THROUGH NON-TRADITIONAL AGRICULTURAL EXPORTS

Since the mid-1980s, USAID agribusiness projects have recognized the importance of expanded trade in non-traditional agricultural products. USAID's promotion of trade-led growth through non-traditional exports has contributed to diversified livelihoods, increased incomes and better diets for farm families and also expanded off-farm, rural employment in food processing and trade-related activities. Egypt's remarkable expansion of its horticultural exports, summarized in the Introduction, is but one of many examples of USAID's support for increasing the production and trade in non-traditional agricultural products and working with partner-country agribusiness value chains to take advantage of profitable trade-led growth opportunities.

With USAID support, Peru became one of the most important exporters of asparagus in the world. Its export volume of fresh asparagus is ranked number one, and its export volume of preserved asparagus number two, globally. This strong development of the fresh asparagus sector in Peru resulted from the initiative of a group of

visionary producers, organized into the regional Producers' Association (IPA), who decided to explore possibilities for diversifying away from their traditional production. With funds provided by USAID, a group of Peruvian experts carried out visits to different production areas in the southern part of the United States. Among the products



USAID ARCHIVES

USAID started working several decades ago in Guatemala to boost the production of high-value, non-traditional produce exports.

identified with the greatest export potential, asparagus was seen as the most attractive, given the high international prices that could be obtained during the off-season. A new asparagus variety developed by the University of California (Hybrid UC-157) was found to be perfectly adaptable to Peruvian conditions. USAID also provided technical assistance that included the introduction of drip irrigation systems, enabling desert cultivation and the integration of production and marketing cycles, indispensable for fresh produce exports. Owing to these collective efforts, Peruvian asparagus exports reached 250,000 MTs in 2010, out of total production of about 330,000 MT, suggesting that local consumption of this very

nutritious vegetable had increased from 1 percent of production in the 1980s to 24 percent.

In Ethiopia, USAID's Agribusiness and Trade Expansion Program (ATEP) helped set up the country's first Code of Practice for fruit, vegetables and herbs. The National Code of Practice established industry guidelines "to ensure the overall development of the horticulture sector, commercialization of agriculture, enhancement of the competitiveness of farmers, and promotion of sustainable agricultural transformation through the provision of comprehensive technical requirements." The ATEP program also provided technical support for three commercial farms to produce commercial table grapes. The first batch of grapes—1,200 kilograms—went to Saudi Arabia



USAID is helping Honduras to expand its non-traditional agricultural exports, such as jalapeño peppers, bell peppers, sweet potatoes, cucumbers and plantains, by improving quality, simplifying paperwork and complying with food safety regulations.

USAID/HONDURAS

and Kenya. Since 2009, more than 145 metric tons have been sold to the growing domestic market. The farms also received advice on packinghouse materials and procedures and export systems. Ethiopia sees a high potential for exporting grapes to the Middle East and Europe.

USAID projects around the world have contributed to the expanding global market for specialty food and agricultural products. Non-traditional exports expanded as rapidly as they did in some countries because they didn't encounter restrictive domestic policies or predatory political interests like those affecting grain staples and traditional exports. Moreover, non-traditional exports didn't register trade-share losses like those for staples due to what the World Bank terms as 'pervasive trade distortions.' Billions of dollars of trade have been created, and producers and consumers are better off as a result.

CONCLUSIONS

USAID's deep commitment to broad-based economic growth has not only made a measurable impact in and of itself, but also helped build support for a broader U.S. government-wide commitment to trade liberalization among developing countries. The expansion of high-value non-traditional exports has created year-round jobs for thousands of previously underemployed rural people.

The 2008 *World Development Report* notes that "the high-value revolution" has created great potential for job and productivity growth in fields like horticulture and livestock. According to the Report, vegetable production can require as much

as five times more labor than do cereals. The rate of employment growth among wage-workers is highest in areas where export-oriented horticulture dominates. At the same time, areas where wheat, dairy and beef dominate have seen wage-worker jobs drop since 1990.

Through the multifaceted approach described in this chapter, USAID has helped developing countries benefit from this shift to high-value production by preparing them to navigate the often complex trade regulations to open new markets for their products.

Some of the trade achievements described in this chapter are unfinished legacies. Global food and agricultural markets continue to evolve. USAID seized the moment during a period of global economic expansion and trade liberalization in 1990s and 2000s to promote non-traditional agricultural export initiatives. Yet as market conditions shift with rising populations and incomes, new concerns have emerged. These include labor standards, gender equity, government regulations and environmental impacts. In the years ahead, USAID will continue to evolve its approach to meet these new challenges.

LESSONS LEARNED

USAID has learned valuable lessons in capacity building for trade, among them:

1. **Taking full advantage of trade-led growth opportunities requires strategic decisions as well as sustained investments and reforms to improve productivity and competitiveness.** Better access to new markets through trade agreements and treaties is necessary but

- insufficient for trade-led growth. Shifting land and labor resources into higher-value agricultural products will need broader institutional restructuring, on- and off-farm services and enterprises, and reorientation of public sector programs and investments to promote diversification out of basic food staples to higher-value agricultural products and to link producers and processors to markets. Such “retooling” may require building a national consensus on a long-term commitment to promoting trade-led agricultural diversification; investing in human capital, entrepreneurial and management skills; strengthening technology development and transfers; upgrading plant/animal health and food-safety systems; and expanding access to market finance and information. Technical assistance from donors and private sector partnerships is usually necessary. The transition period may last a decade or two.
2. **Trade liberalization successes obscure lurking threats to open trade.** Newly acquired capacities of trade analysis, negotiation, participation, and implementation will help ensure that borders remain open and that producers, processors and exporters have continued access to markets. But, as both the avian influenza and the global commodity crisis in 2007–08 have shown, borders may be shut suddenly and haphazardly when countries’ food security or biosecurity are threatened. This underscores the importance of USAID support for training the next generation of food trade analysts.
 3. **USAID achievements in broader trade facilitation, institutions, and policies have had an indirect, but significant impact on agricultural trade flows.** The work of USAID’s trade hubs, trade facilitation, and other trade capacity-building programs—working with private sector as well as government organizations—are contributing significantly to expanding agricultural trade opportunities.
 4. **The last 20 years have seen a marked turn away from donor support for trade-facilitating public institutions; the time may be right for the pendulum to swing back toward public institution-building.** Publicly-provided services—including modern customs services; efficient border systems for identifying agricultural and food-borne hazards and authorizing safe operations; continued support for trade capacity building and agricultural research, extension and education; inter-agency and inter-governmental collaboration; and food safety agencies with modern laboratories—are needed if agricultural goods are to flow efficiently across borders and consumers are to benefit from an expanded array of food products available year-round at affordable prices.
 5. **It is difficult to separate achievements in trade expansion and trade-led growth from those in rural enterprise development.** Building capacity to analyze impacts of trade policy and to negotiate trade agreements, comply with their commitments, and benefit from them; strengthening country abilities to meet international food standards and

regulations; developing an approach to address pandemic disease threats and avoid threats to rural enterprises, markets and trade; and promoting trade-led growth via non-traditional agricultural exports are directly connected to USAID's achievements in rural enterprise development. They could not have happened without the rise of a private sector paradigm in USAID and its application to agriculture; the embrace of a value-chain, agribusiness approach to agricultural sector programming; the development of

relationships with private sector partners; and USAID's longstanding commitments to integrating lessons from social science research and policy analysis.

6. **The ability to take advantage of trade opportunities depends directly on investments in and maintenance of commercial and physical infrastructure.**

Exporters rely on rural roads and highways; railroads; bridges; ports and airports; and warehouses, processing and packaging plants. These in turn depend on reliable sources of water, fuel and electricity. Commercial infrastructure is critical, too, for financial transfers, communication technologies, and fair and transparent regulatory oversight and enforcement. No amount of trade capacity building can compensate for antiquated, badly maintained or missing infrastructure.

CAN THE RURAL POOR BENEFIT FROM HIGH-VALUE CROPS?

A question of continuing interest to the Agency is how these non-traditional agricultural export (NTAE) crops – and small-scale producers of these crops – fared over time. In 2010, USAID commissioned a retrospective assessment of two regionally-based NTAE projects funded by USAID in Central America, ProExAg (1986-1991) and Exitos (1991-95), to determine to what extent the growth of NTAE crop industries had an impact on creating jobs and raising incomes among the poor – even if these two projects, focused on generating foreign exchange to help Central American countries to service their foreign debts, did not have job creation and poverty reduction as their primary objective.

The 2010 USAID assessment built on a 2009 study of the ProExAg and Exitos projects. The 2009 study, funded by the projects' implementer, sought to measure the impact of these two projects on catalyzing the development of NTAE crop sectors in Central America in the 1980s and 1990s. The two projects had had a significant influence on providing agricultural expertise, market support and training to farmers and businesses, and strengthening local export institutions. As evidence, of the 18 non-traditional products that these two projects selected for export promotion, five were still being regularly exported 15 years later: blackberries, mangoes, cantaloupes, French green beans and snow peas.

The implementer's study also attempted to measure the influence of these projects on the development

of sustainable NTAE sectors. Using an Attribution Measurement Framework based on high/medium/low scores, the study classified and ranked project activities—introducing a new crop, promoting a full package production technology, and linking producers to new markets—for their influence on non-traditional crops. The two projects received an attribution of “high” influence on five crops, a “medium” influence on nine crops, and a “low” influence on four. Of the five regularly-exported non-traditional crops above, the projects scored a high influence on the export of blackberries, a medium influence on mangoes and cantaloupe, and a low influence on French green beans and snow peas—clearly, a mixed picture. Differences in relative production and marketing potential and a diversity of enabling or constraining conditions accounted for the lower export performance of other crops.

The main contribution to the success of the two projects was their support for creating opportunities for initial business deals, attracting foreign buyers, and creating a bi-annual agricultural fair and trade show as well as setting up market intelligence units. Better crop management, technical innovations, training, use of high-quality, and imported, genetic materials also contributed to the success of these crops. Other enabling factors were earlier USAID projects that laid the groundwork for ProExAg and Exitos, including investments in transport infrastructure, especially roads; multiple export marketing channels to stimulate competition; and the creation of phytosanitary units

and a comprehensive traceability system that was developed in the wake of a costly microbiological contamination issue in 1996 that shut Guatemalan raspberry exports out of the United States for three years.

The USAID assessment carried out follow-up field interviews and other data collection in Guatemala that provided evidence on the income generated for small farmers and their families from two non-traditional export crops promoted in the 1980s and 1990s—blackberries and French green beans.

Using an economic multiplier of 2 (selected on the basis of previous analyses), the assessment found that each dollar earned by NTAE farming households, day laborers, and seasonal workers stimulated additional economic activity valued at two dollars from the export of blackberries (an annual total of \$7.5 million) and French green beans (nearly \$2.9 million).

The increased income from exporting blackberries helped those households “avoid the poverty” affecting other households in their areas. While not as strong as the impact of blackberries, French green beans provided a supplement to household income and, in some cases, lifted households out of poverty. Overall, the USAID assessment provided evidence that the

quality of life of small-scale producers of successful NTAE crops improved due to the creation of job opportunities in the fields and packing sheds, boosting their incomes above incomes of other farmers who continued to produce their traditional subsistence crops.

Together, the findings and conclusions of the 2009 study of the ProExAg and Exitos projects and the 2010 assessment highlighted several key lessons:

- » *When promoting NTAE crops, breaking into a new sector requires careful planning and taking a thorough, critical look at the opportunities and constraints and level of external support required to sustain success, typically a 10–15 year endeavor;*
- » *Diversify the mix of non-traditional crops as winners cannot be predicted with certainty and slow-starters may take off later;*
- » *Governments need to improve the transparency, availability and timing of export sector information to help sustain existing exports and promote new ones; and*
- » *The opportunity for small-scale rural producers to participate in growing, harvesting, and packing NTAE crops creates labor-intensive job opportunities at higher wages.*



NINE

Working with the Earth

INTEGRATING ENVIRONMENT AND NATURAL RESOURCES MANAGEMENT INTO AGRICULTURAL PRACTICES AND LIVELIHOODS

The 20th Century saw the high point in humanity's effort to feed itself—the Green Revolution. But the century also saw the low point in environmental stewardship as intense human activity inflicted damage on the planet's natural systems on a scale never before seen.

The facts paint a sobering picture. Over the past two decades, agriculture consumed half of the synthetic nitrogen fertilizers ever used on Earth. Excessive quantities of fertilizer are now wasted and wash into rivers and oceans, causing “dead zones” devoid of oxygen and marine life. About 43 percent of tropical and subtropical forests and 45 percent of temperate forests have been converted to croplands. And agriculture uses 70 percent of global freshwater, prompting environmental groups, scientists and farmers to search for new technologies and practices to reduce water use in food production and processing and to manage the competition for water from urban areas.

Many human activities continue to undermine critical ecosystem services that purify the air, regulate water flows, restore soil fertility and pollinate crops. Economic growth in most developing countries is possible only with a reliable and sustainable supply of domestic natural resources. Yet, these resources are threatened by rapid population growth; extreme poverty; inequitable access to land and other resources; pollution of the air and water; soil toxicity and erosion, short-sighted extractive policies; and economic and political instability.

Humankind has learned the hard way that investing in ecosystem restoration and environmental conservation along with improved natural resource management increases resiliency and improves sustainable livelihoods. Over the last five decades, USAID's leadership in integrating environmental considerations and natural resource management into agricultural practices has significantly improved prospects for more secure rural livelihoods. USAID's environmental and natural resource policies address the fundamental threats to sustained increases in agricultural productivity as well as the immediate consequences of environmental degradation. USAID's success has been based on a growing appreciation of the dependence of agriculture on wise stewardship

AT LEFT Boys take a break from transplanting rice seedlings in Burundi.

of natural resources—particularly in a world increasingly threatened by climate change.

USAID has promoted natural resource management as critically important in helping to sustain the productivity of agricultural systems while restoring natural resources in ways that support good governance, access rights for resource users and more equitable sharing of benefits. USAID has been a leader in promoting integrated pest management and the development of standards that reinforce attention to environmental sustainability in agricultural practices. Drawing on our own experience in the U.S., most of our early agricultural projects incorporated soil and land conservation. USAID played a key role in extending the use of drip irrigation, micro-dosing of fertilizers and more efficient use of water and other resources in agriculture. USAID and its partners have also championed the use of green cover crops, minimum or zero tillage, erosion control and other conservation farming and soil fertility management practices. USAID has

been a major contributor to the resurgence of agroforestry practices and evergreen agriculture as means to both intensify and diversify rural production systems in sustainable agricultural landscapes. USAID has also promoted better water management for watersheds, irrigation and river basin planning.

Sustainable agriculture is emerging as “a set of complementary approaches that seeks to minimize negative environmental impacts from agriculture by increasing efficiency of input use and by making greater use of biological and ecological factors in production processes” (FAO 2003). USAID and its partners have been in the forefront of developing a range of new technologies, management strategies, and analytical tools relevant to sustainable agricultural intensification.

Over the course of USAID’s 50 years of work in agricultural development—and especially in recent decades—the Agency’s understanding and application of environmental principles and natural resource management practices have

USAID/Bangladesh helped to make small scale aquaculture a viable means of income for women and very poor farmers.



JEANNIE HARVEY

PRODUCTION PRACTICES RELATING TO SUSTAINABLE INTENSIFICATION OF AGRICULTURE

INTEGRATED PEST MANAGEMENT (IPM) is an ecosystem-based strategy that seeks to control pests or their damage through a combination of techniques (biological control, pest monitoring against economic thresholds, habitat manipulation, modification of cultural practices, use of resistant varieties), using less toxic chemical pesticides only after pest monitoring indicates their need.

CONSERVATION FARMING (CF) encompasses four broad, intertwined management practices: minimal soil disturbance (no plowing and harrowing), maintenance of a permanent vegetative soil cover, direct sowing, and scientifically-sound crop rotation.

LOW EXTERNAL INPUT AND SUSTAINABLE AGRICULTURE (LEISA) uses farmers' knowledge and a range of management practices (agroforestry, IPM, intercropping, crop-livestock integration, microclimate management) to minimize the need for purchased inputs.

ORGANIC AGRICULTURE employs agronomic, biological and mechanical methods to control pests and maintain soil fertility with virtual elimination of synthetic chemicals for crop and livestock production.

PRECISION AGRICULTURE maximizes productivity of inputs, often using a global positioning system (GPS), to match input application and agronomic practices with soil attributes, seasonal conditions, and crop requirements as they vary across a field or between small plots.

DIVERSIFICATION is an adjustment of the farm enterprise pattern in order to increase farm income or reduce income variability by reducing risk, by exploiting new market opportunities and existing market niches, diversifying not only production, but also on-farm processing and other farm-based, income-generating activity.

World Bank. Agriculture Investment Sourcebook, May 2006.

evolved as science and societies have learned more about the relationships between society, agriculture and the natural systems that support life on Earth. President John F. Kennedy signed the order establishing USAID just a year before the publication of Rachel Carson's *Silent Spring* sparked new examinations of human interaction with the natural world. As the wider world gained an increasingly better grasp the concepts of ecology and sustainability, so did the Agency. USAID has taken on a leading role in promoting agricultural solutions that include environmental considerations as essential elements in international assistance and sustainable development programs.

ACHIEVEMENTS

USAID's work in integrating environment and natural resource management into agricultural practices and livelihoods resulted in three main achievements: scaling up through watershed and landscape management; incorporating environmental standards and protections into rural enterprises and international public-private partnerships; and championing new governance arrangements, participatory approaches and partnerships to enable scaling up of transformative landscape developments. A fourth achievement, empowering community-based natural resource management, is placed in Chapter 1, *Securing Access to Land and Other Natural Resources*.

9.1 SCALING UP THROUGH WATERSHED AND LANDSCAPE MANAGEMENT

The impact of some harmful agricultural practices is so pervasive that it cannot be fixed

by compartmentalized or piecemeal methods. Only a comprehensive approach—at watershed and landscape scales—can ensure success and sustainability.

Jamaica is a good example where USAID's wide-scale approach has yielded dividends. In Jamaica, USAID promoted better technologies, policies and capacity building for watershed management to improve environmental quality and contribute to rural and agricultural development. Eighty percent of Jamaica's land surface is hilly or mountainous and extremely vulnerable to land degradation and erosion. Coastal waters are polluted by silt and nutrients that in turn damage coral reefs and marine ecosystems. This link between upland watershed and coastal activities and practices, and their combined impact on the quality of Jamaica's prized coastal waters, was the focus for USAID/Jamaica's integrated Ridge to Reef Watershed Program (2000–05) and related projects (1997–2004). This program achieved remarkable improvements in watershed management practices at the community level by setting up and working through watershed management committees and their associated task forces. The program reinforced the importance of a participatory approach to identifying and prioritizing actions as well as establishing extensive stakeholder and community consultations to achieve local ownership and improve monitoring and compliance through public awareness campaigns. USAID/Jamaica continues to focus on achieving sustainable natural resource management and biodiversity conservation while building economic



Wetlands in Hail Haor, Bangladesh, in 2006. As a result of USAID support and assistance, this once degraded site has been restored to improve the flow of water and fish from larger rivers.

opportunities as a key component to stability and sustained development.

In Haiti, USAID's support for the Hillside Agriculture Program (HAP, 2000–07) benefitted Haiti's poorest farmers, of whom approximately 70 percent work on severely eroded hillsides. To make hillside farming sustainable, one must grow suitable crops (such as perennial tree crops) and use the right techniques (such as soil conservation and land tiling). HAP was designed to increase farmer productivity and raise incomes by promoting environmentally-friendly tree crops with export potential. The program focused on the production and marketing of traditional export crops (coffee, cocoa, and mango) and the provision of technical and financial support to the Haitian Federation of Coffee Growers (FACN) to increase its coffee production and export capacity, and then served to replicate these successful production activities to other prime agricultural areas of the country. Overall, the program had a positive impact in reaching over 40,000 farmers and resulting in a 22 percent increase in average revenues generated by targeted crops. Mango producers groups and exporters assisted by HAP were able to ship over 6,000 boxes of certified organic mangoes to new U.S. buyers, with a 25 percent premium over the regular farm gate prices for the organic mangoes. The program also successfully replicated

production of high-value vegetable crops allowing participating farmers to increase their revenue significantly. USAID has since continued with similar watershed management programs.

Farmers in Mali, in the West African Sahel, must deal with periodic droughts and make the most of less than 1,200 mm of rainfall that generally falls within only a three month period of the year. The risks of soil erosion are severe, even though slopes are generally less than 5 percent. *Aménagement en courbes de niveau* (ACN), loosely translated as ridge tillage, provides an effective soil management system which increases rainfall capture, reduces drought risk for crops, increases crop yields, and increases biodiversity. The permanent ridges used in ACN absorb the first rains, enabling earlier planting and germination of seeds and giving plants more time to grow before producing grain. This has led to increases in yields of millet, sorghum, peanuts, cotton and maize by 20 to 50 percent. Soil carbon has also increased, further stabilizing and increasing yields as well as sequestering atmospheric carbon in the soil. Spontaneous regeneration of three ecologically and economically valuable tree species, *Faidherbia albida* (*Acacia albida*), *Adansonia digitata* (baobab) and *Vitellaria paradoxa* (shea nut), has been observed in ACN fields. In addition, the reduction in rainfall runoff due to ACN results in more

recharge of groundwater upward of 150 percent. Groundwater is the primary water source for villages, but recent climate change has decreased availability, threatening this main source of fresh drinking water.

USAID's work has led to farmer-to-farmer transfer of ACN technology that is spreading throughout the Sahel. In many villages using this technology, women now irrigate home gardens during the dry season. These gardens increase family income through market sales and improve dietary diversity and nutrition through consumption of vegetables. Farmers in the Sahel are embracing this technology because it has a real, measurable impact on their livelihood.

Over the years, USAID and its partners have contributed to innovations in integrated watershed management and sustainable landscape management. USAID has also helped to capitalize on lessons learned and disseminate information about effective, improved practices that produce more food and increase local incomes while reducing erosion and restoring degraded lands. This has often included improved land use planning, appropriate integration of perennial crops, reduction of barriers to sustainable production and marketing of products from trees and other interventions aimed at turning liabilities and causes of degradation into opportunities for integrating soil and water conservation, agroforestry and other improved natural resource management into agricultural practices. Farmers have repeatedly demonstrated their willingness to invest in the land when the risks and obstacles to doing so are reduced, and when they are enabled

to boost the productivity of their agro-ecosystem in ways that increase their income.

9.2 INCORPORATING ENVIRONMENTAL STANDARDS AND PROTECTIONS INTO RURAL ENTERPRISES, VALUE CHAINS AND INTERNATIONAL PUBLIC-PRIVATE PARTNERSHIPS

As a major achievement, USAID activities have incorporated environmental standards and integration of natural resources management (NRM) practices into the production of a wide variety of high value crops for export to large supermarket chains in Europe and other major buyers of agricultural produce. USAID's support for partnerships and alliances, such as the Rainforest Alliance Sustainable Agricultural Network (SAN), has been instrumental in bringing about this transformation. Producers throughout Latin America, Africa and Asia have received training and other assistance to meet environmental and other standards required for certification that their agricultural crops were produced using more sustainable and environmentally-sound practices. Since 1992, more than 700 certificates have been awarded to some 80,000 farms covering over 700,000 hectares in 27 countries that have met SAN standards. USAID has also funded partners to train producers on how to comply with "good agricultural practices" (GAPs) required by international certification schemes such as EurepGAP and GlobalGAP. In Honduras and in other USAID-assisted countries, training encouraged and enabled farmers to minimize the negative environmental impacts of pesticide use in farming

operations, reduce the use of chemical inputs and ensure a responsible approach to worker health and safety in order to comply with GlobalGAP standards.

USAID has supported more than a decade of steady global progress in expanding support for biodiversity conservation by funding the Biodiversity Support Program (BSP) and the Global Conservation Partnership (GCP) as well as the Biodiversity Conservation Network (BCN) in Asia, regional partnerships for the Amazon and Central America, as well as the African Biodiversity Conservation Group (ABCG) in Africa.

USAID has also provided leadership in the identification, negotiation and implementation of Global Development Alliances (GDAs) that leverage funding from private sector firms and foundations for capacity building to produce higher-quality coffee, bananas and other export crops more sustainably, enabling local producers to earn higher incomes by marketing to global

buyers. For example, in Rwanda, USAID assistance to the coffee sector contributed to the rapid growth of exports of higher-quality, washed specialty coffees with sales increasing from virtually zero in 2001 to \$3.1 million in 2006. Moreover, this big jump in export value was achieved in tandem with the adoption of improved water conservation, water recycling, energy efficiency, composting and waste management practices. The adoption of improved coffee-growing practices in Mexico, Panama, Bolivia and Madagascar, leading to the increased value and volume of coffee exports, has also benefitted biodiversity conservation. In response to the coffee crisis of 2000–04 when farm gate prices for coffee were at an historic low, USAID leadership and project support enabled some 25 countries to restore lost livelihoods and export earnings. This was done through partnerships with the private sector and a shared commitment to the integration of NRM and improved management practices into coffee production while capitalizing on market opportunities for higher-value, certified coffee.

Working on another front, USAID has promoted “green finance” through alliances and partnerships with Root Capital, Verdi Ventures and other financial organizations that spur investment in environmentally-sound agricultural activities, small businesses and rural development to build sustainable livelihoods. Since its launch in 1999, Root

“... USAID assistance to the coffee sector contributed to the rapid growth of exports of higher quality, washed specialty coffees with sales increasing from virtually zero in 2001 to \$3.1 million in 2006.”

Capital has provided \$330 million in credit to nearly 350 small and growing businesses in 30 countries. With loan guarantees from Root Capital and others, local producers have been able to invest more in their businesses, connect with markets, and increase their level of exports of certified products.

Focus on Forests.

For two decades, partnerships and alliances have been critical to USAID's achievement of major results and significant impacts in the area of sustainable tree crops and other exported agricultural products, the expansion of movements supporting sustainable forest management and trade in certified forest products. These programs and partnerships have also been key factors in the rapid progress and continuing success of movements and networks to certify well-managed tropical forests and to promote trade in certified (sustainably managed and legally harvested) forest products while discouraging and reducing trade in illegal forest products.

Beginning in the early 1990s, USAID has distinguished itself with its leadership and contributions to the development of forest product certification standards and procedures, such as those recognized by the Forest Stewardship Council (FSC). Over the past 15 years, the total area of forest managed in accord with the FSC principles and criteria for improved forest management has risen to more than 140 million hectares. In 2011, FSC passed a milestone with the issuance of over 20,000 "chain of custody" certificates that track the movement

of FSC-certified material from the forest to the consumer to restrict trade in illegal forest products. The development and level of global adoption of these standards was virtually unimaginable 25 years ago as the world wrestled with the problems of tropical deforestation and corrupt practices in the timber trade.

In the 1990s, as a result of USAID funding, Bolivia moved ahead rapidly to assume a leadership role among tropical, developing countries in the adoption of sustainable forest management practices that brought nearly a million hectares of lowland tropical forest under certified management. Prior to the mid-1990s, the lowlands of Bolivia that include some 50 million hectares of forests—equal to all of those in Central America and Mexico combined—were the destination of planned and unplanned colonization. The allocation of logging rights provided few safeguards for sustainable timber management or recognition of the land rights of indigenous peoples living in the forests. Beginning in 1994, USAID financed the Bolivia Sustainable Forest Management (BOLFOR) project to promulgate a new Forestry Law which dramatically altered the pattern of development in the forestry sector and set the stage for Bolivia's worldwide leadership in sustainable forest management. The 1996 Forestry Law accorded rights to indigenous groups and established new tax policies and provisions that resulted in a dramatic shift away from non-sustainable forest extraction methods to improved forest management practices in targeted areas. BOLFOR also helped to establish a national capacity for certifying sustainable forest management through

the creation of the Bolivian Council for Voluntary Forest Certification to take advantage of the growing market for certified forest products. In 2002, forest and wood industries generated about \$100 million in exports, with projections reaching as high as \$360 million by 2014 from sawn timber, manufactured wood products and non-timber forest products. Even more compelling, the BOLFOR experience transformed the tropical forest management policies of leading international conservation organizations who learned that managed forestry practices are compatible with biodiversity protection and poverty alleviation.

USAID played an instrumental role in producing and advancing guidelines such as the Good Wood Guide and the development of public-private partnerships and networks for trade in legal, certified forest products. In collaboration with the World Wildlife Fund and others, the Global Forest and Trade Network was formed in 1991, and it has served to shift the trade in forest products from non-certified to certified forest products. More recently, USAID has provided important leadership in promoting networks to combat illegal logging, such as the Forest Legality Alliance, to reduce deforestation and promote the trade in legally harvested forest products from well-managed forests, and thereby help to enforce provisions of the Lacey Act that combats trafficking in “illegal” wildlife, fish, and plants. The Forest Legality Alliance is already making an impact.

9.3 CHAMPIONING NEW GOVERNANCE ARRANGEMENTS, PARTICIPATORY APPROACHES AND PARTNERSHIPS THAT VEST RESPONSIBILITY FOR THE MANAGEMENT OF THESE NATURAL RESOURCES WITH LOCAL POPULATIONS

In 2002, USAID prepared a discussion paper, “Nature, Wealth and Power” (NWP), that looked back on 20 years of support for rural development—and looked forward with reflections about practical “best bets” to revitalize rural Africa. This paper highlighted the interdependent relationships between a) sound natural resources management, b) economic growth and poverty alleviation, and c) empowerment and enfranchisement of communities whose livelihoods depend on the natural resources around them. All the cases presented in NWP pointed to the critical importance of integrating support for NRM, enterprise development and good governance for more sustainable and effective rural development strategies. In each case, the lessons from the field were clear: rural people needed the rights to benefit from natural resources in order to capitalize on the economic benefits and to provide a clear incentive for continued investment in the protection and improved management of natural resources. Where this integrated NWP framework has been used to guide interventions, the results have been impressive: simultaneous progress in restoring the productivity of natural resources and conserving biodiversity, increased contributions to local incomes and economic growth, and the emergence of more democratic expressions of good governance. Additional case studies and analysis

“In each case, the lessons from the field were clear: rural people needed the rights to benefit from natural resources in order to capitalize on the economic benefits and to provide a clear incentive for continued investment in the protection and improved management of natural resources.”

were carried out in other parts of the world that endorsed NWP’s principles and recommended actions as useful and relevant.

Beyond promoting the NWP strategic framework for program design and implementation, USAID has played a key role in stimulating local investment to scale up the sustainable use of forests, soil, water, fisheries, wildlife and other resources. In Bangladesh, USAID-funded projects worked with the government to establish a more favorable framework for the participatory and collaborative management of wetlands and natural forests. Critically important enabling conditions included longer-term leases for water bodies managed by duly-recognized and strengthened resource management organizations. Guidelines for the formation of forest co-management committees and councils specified their roles and responsibilities

and clarified provisions for more equitable sharing of power and benefits among local stakeholders. These necessary policy shifts and reforms were combined with institutional capacity building at national and local levels, and with the organization of a range of support services at the field level to stimulate the widespread adoption of improved practices for conserving, restoring and managing what had been open-access, degraded water bodies and poorly-protected “protected forests.”

A key factor in the success of integrating NRM into agricultural practices and livelihoods was the consistent support for participatory approaches for the empowerment of rural organizations championed by USAID and its partners. This participatory approach emerged from earlier farming systems research (FSR) and best practices of Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA) used by USAID project field staff and many other development partners for problem diagnosis, project design and performance monitoring. The NRM “community of practice,” supported through a portfolio of USAID projects and programs, championed participatory approaches to good effect, including increased attention to the role of women in development and to mainstreaming gender sensitivity in NRM and rural development.

This focus on full participation, empowerment and capacity building at the grassroots led to the development of resource user groups and community-based organizations as foundational building blocks for sustainable progress in rural development.

CONCLUSIONS

Without a dramatic transformation, current food production systems seem unlikely to feed a growing population in a changing climate while sustaining essential ecosystem services. With finite resources of land, water and fossil fuels—and the urgency of reversing decades of unsustainable economic growth and agricultural practices—the need for enlightened stewardship of the natural resource base to support sustainable agricultural production has never been greater. USAID needs to continue in the vanguard of changing how the world produces its food and non-food agriculture more sustainably.

USAID must build on past pilot efforts and achievements to lead the way in scaling up solutions that are at once economically viable and environmentally sound.

Climate change seems certain to increase the vulnerability of many poor and rural populations. Smallholder farmers and other rural people will likely face more variable and erratic rainfall and temperatures, sea level rise, and increased risks of flooding, drought and severe storms. Promoting widespread adoptions of natural resource management that contribute to the maintenance of ecosystem services and landscape restoration may soon become the most important single

consideration in agricultural development and global sustainability.

The world is looking for less costly, naturally renewable and more sustainable means of regenerating soil fertility and increasing agricultural productivity. “Evergreen agriculture”—the expanded use of nitrogen-fixing legumes in crop rotations, no-till, green cover crops and other forms of conservation agriculture—hold the bright promise of a planet on the mend. Expanded efforts to protect, capture and conserve water resources along with provisions for more efficient use of water and increased investments in watershed management are also urgently needed.

As demonstrated by the achievements in agricultural development and natural resource management documented in this chapter, more effort should be directed at investing in restoring degraded, overused farmland with agroforestry and soil and water conservation practices that contribute to both a diversification and intensification of rural production systems.

Improvements to community-based and landscape-level land use planning should be made to protect intact natural forests and critical watersheds and to better use depleted lands and cut-over forests through adopting sustainable agricultural practices and careful siting and development of agribusinesses and crop production systems.

Further efforts should explore, assess, identify and promote ways to ensure that the maintenance of ecosystem services and conservation of biodiversity are an integral part of the improvement of agricultural production systems at the landscape level.

And finally, donors and other development organizations should reengage in human resources development through farmer-to-farmer visits, exchange visits, public-private partnerships for long- and short- term training, promotion of e-learning and communities of practice through knowledge management tools and networking.

Moving forward, particularly in Africa, USAID should continue to improve cropping systems with adaptations for Africa's deeply weathered soils; alternative land use and production systems well adapted to semi-arid lands; and rural production systems incorporating diversification as well as intensification strategies to reduce rural poverty.

USAID has considerable experience in these important areas, and scaling up successes already achieved through integration of natural resource management into agriculture and rural livelihoods can benefit billions of people.

LESSONS LEARNED

In effort to achieve widespread and enduring impacts from investments in natural resource management, USAID and its partners have learned some significant lessons. Many of them have been well documented through strategic assessments, program reviews, project evaluations and specific exercises to take stock of what's working and why. Among them:

1. **Tree planting programs are ultimately unsuccessful when intended solely to stop deforestation and forest degradation.** These programs will not be sustainable without local-level governance-management structures.

But policy and governance reforms and other interventions to secure access to land, harvesting rights and incentives for local investment in growing and managing trees on farms as well as forests and harnessing the power of natural regeneration have triggered improvements on a large scale.

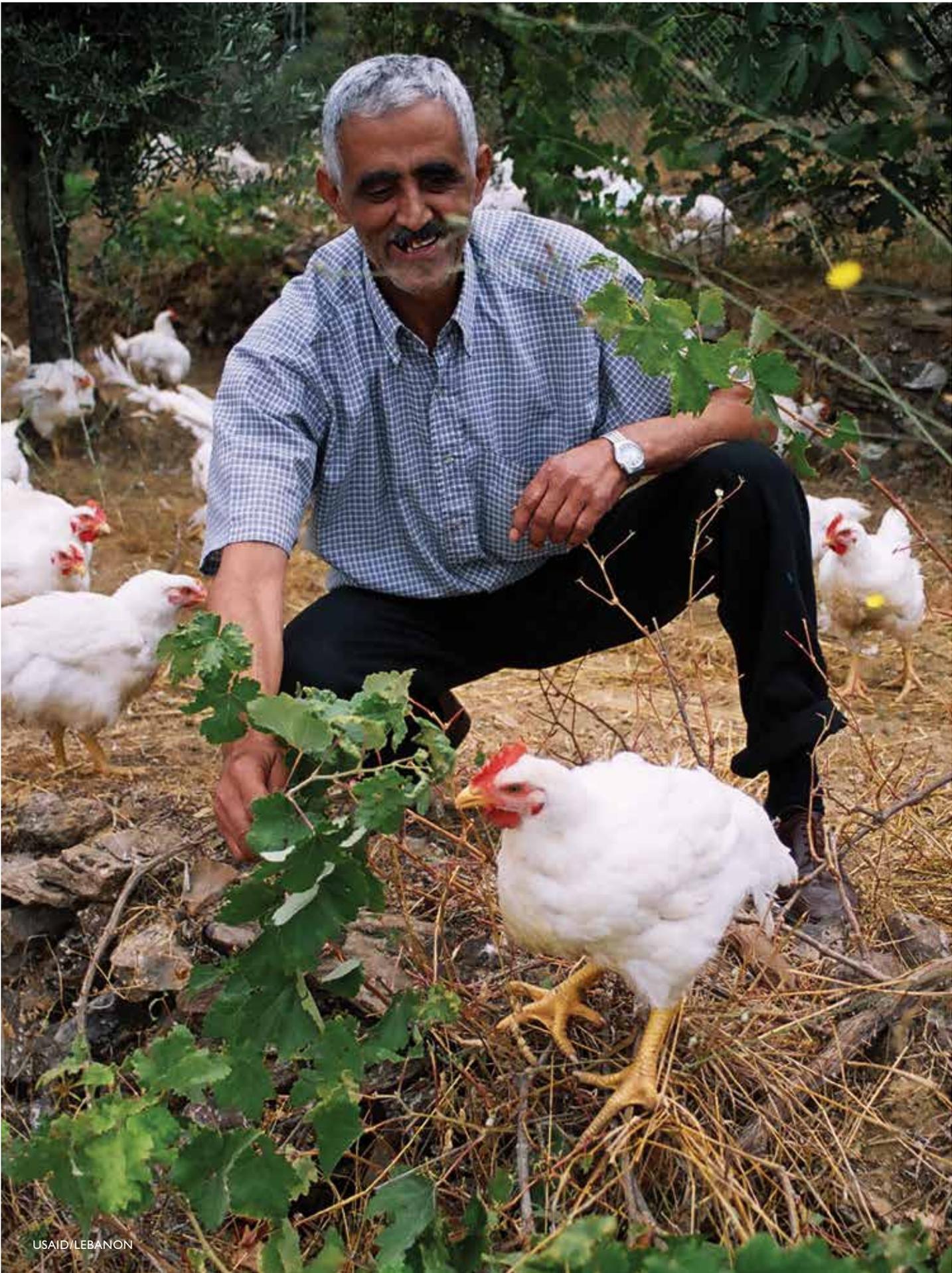
2. **Market-based incentives provide the initial impetus for farmers and communities to a) invest in more productive and protective natural resources management practices and b) sustain their willingness to continue to invest in better practices.** Improved natural resources management approaches are more likely to be supported when aligned with the expected increase in income they bring, whether based on the market value of improved land, increased production or losses averted.
3. **The onset of climate change and higher energy costs have stimulated measures to reduce risk and to adapt rural production systems to environmental constraints.** These and other sustainable measures, such as greater use of perennials and more attention to improved management of trees and forests, may generate more benefits than traditional annual crop and livestock production. The prospect of higher income is a powerful incentive to align producer behaviors with these disaster risk-reduction approaches.
4. **Collaborative efforts are effective when focused on increasing productivity, sustainable use, value-added processing and more effective marketing.** Natural resource

management practitioners have succeeded in working collaboratively with rural enterprise and microenterprise development to increase rural incomes by strengthening value chains while improving natural resource management practices.

5. **Investments in monitoring and evaluation, knowledge management and capacity building pay good dividends** in identifying and promoting best practices, including the effective use of study tours and farmer-to-farmer visits; integration of women into agricultural development, and increased attention to governance issues.
6. **USAID and its partners can do more to extend success from one country to others.** For example, USAID promoted policy changes that led to the widescale adoption of community forestry in Nepal, pioneered natural forest management in West Africa and supported community-based natural resource management in Southern Africa. But the experience has not been fully applied in the Congo basin and elsewhere in Asia and Latin America.
7. **Improved management of perennial crops, livestock, fisheries and wildlife in rural production systems has provided a valuable source of extra income for smallholders and**

marginalized people. Improved management has also contributed to better nutrition and food security.

8. **Production-oriented approaches to livestock development and range management practiced in the global North often do not work well in the global South where risk management and other factors were the most important considerations.** However, improved management of rangelands, pastures and livestock remain critically important to achieving success in landscape-level interventions aimed at more sustainable use of natural resources for poverty reduction and better rural food security. The search for locally-effective approaches should continue.
9. **Developing professional natural resources extension services and strengthening the capacities of grassroots rural organizations are necessary for building effective environmental alliances.** By working towards the same objectives, these services and organizations can restore the productivity of the resource base and contribute to stronger environmental governance and the more equitable distribution of benefits that reinforce sound natural resources management.



LOOKING BACK, MOVING FORWARD

Speaking some thirty years ago to the World Affairs Council of Philadelphia, President Ronald Reagan praised America's support for agricultural development around the world:

“Increasing food production in developing countries is critically important for some, literally a matter of life and death. It is also an indispensable basis for overall development. The United States has always made food and agriculture an important emphasis of its economic assistance programs. We have provided massive amounts of food to fight starvation, but we have also undertaken successful agricultural research, welcomed thousands of foreign students for instruction and training at our finest institutes, and helped make discoveries of the high-yielding varieties of the Green Revolution available throughout the world.”

USAID played a leading role in that story—and the Agency is writing new chapters all the time.

During its first 50 years, USAID has helped millions of households secure access to land and other resources; mobilized science and technology research to improve agricultural productivity that has fed millions; built dozens of agricultural education institutions; improved the performance and accessibility of agricultural markets; linked rural people to financial services for credit and savings; invested in job-creating rural agricultural enterprises and value chains; helped develop agricultural and food policy research and analysis capacities; expanded global and regional agricultural trade opportunities to help exporters comply with food quality and safety standards; and

AT LEFT USAID has supported Lebanon's landmine survivors to improve their incomes through livestock cooperatives such as raising chickens.

integrated natural resources management and concern for the environment into agricultural practices and livelihoods.

The story is not just about what USAID accomplished, but how.

LOOKING BACK

This report is the result of hundreds of hours of research, including review of source documents and interviews with key informants. During this process, it became clear that certain themes transcended regions and even decades: One hallmark of USAID agricultural development specialists has been a genuine desire to facilitate the transformation of agricultural sectors, while upholding professional standards and integrity—whether interacting with host country counterparts, short-term trainees or rural villagers. This has gone hand in hand with a willingness

to learn, improve and adjust—whether through advances in agricultural science and technology; lessons learned from development successes and failures; or changes in Agency policy, budget, leadership or assignment abroad.

The readiness to innovate, find pragmatic solutions and break out of old thinking is also part of this story. Conventional wisdom suggests that USAID in general has had a poor record of documenting its work. Contrary to this assumption, the Agricultural Legacy team discovered vast resources referenced in report bibliographies. Unfortunately, USAID’s archives are still incomplete. It is evident that while prior generations of USAID officers did document their work, efforts to preserve and organize these records were less successful. As a result, some of this invaluable material and seasoned wisdom may have been lost.

Just as USAID has a tradition of assessing

both successes and failures, the Agricultural Legacy team sought to paint a balanced picture in this report. Over the course of this effort, our interviews and document reviews pointed to a number of areas where USAID could have done things better. A few of these deserve further consideration.

First, it may benefit USAID to maintain a longer-term planning and implementation horizon for agriculture sector programs. In some instances, it appears that the

“One hallmark of USAID agricultural development specialists has been a genuine desire to facilitate the transformation of agricultural sectors, while upholding professional standards and integrity—whether interacting with host country counterparts, short-term trainees or rural villagers.”



USAID promotes the development, appropriate use, and commercialization of resource conservation technologies such as the mechanical rice transplanter in India. This technology increases yields while reducing farmer dependence on water and labor, and drudgery work by women who otherwise spend long hours transplanting rice by hand.

Agency's activities wound down before all the components became fully sustainable. A diversity of examples—a university development project in Ethiopia in the 1960s, a forestry development project in Pakistan in the 1980s/1990s, and a horticultural marketing project in Ukraine in the 2000s—suggest that just one more growing season or another year or two of implementation might have helped to consolidate success. Were these short horizons due to faulty assumptions, implementation issues, counterpart disinterest, inadequate oversight, budget constraints, USAID staff turnover, or a combination of these and perhaps other factors?

Second and closely related, is the Agency too readily satisfied with successful pilots and content to move on, leaving it to other stakeholders and donors to scale up? A demonstration effect or

“proof of concept” may not be sufficient to attract local governments, other donors and private sector investors. To maximize success, USAID may need to embrace longer time horizons.

Third, there is the question of whether to go it alone or join with others. The Agency has been inconsistent about whether or when to work with others, especially other donors. Ample examples of both approaches can be found; for example, the decades-long participation with the government-donor Grain Marketing Reform Program in Mali, or USAID support to various multilateral and regional organizations. Actually, there are very few instances where partnering with others did not work out well. In recent years, the balance has tipped toward more partnerships and alliances, recognizing that with finite resources, USAID can't do everything itself and must work more selectively and smarter.

There are many instances where we have adjusted our approach. Our understanding of agricultural development continues to expand. In the early years, we focused on production and technical “fixes” without considering constraints elsewhere. We didn’t pay attention to markets, policy reform, tenure issues, or the central role of women in agricultural production systems. Many USAID programs focused largely on crops to the

exclusion of livestock, sheep and goats, fisheries, agro-forestry and vegetable production.

We have a more holistic understanding of agriculture’s contribution to poverty reduction and implementation of the Millennium Development Goals. Feed the Future is strengthening the conceptual and programmatic links between agriculture and nutrition.

OUR LEGACY, SUMMING UP

USAID hasn’t got everything right. The Agency has its share of detractors. Some in the American public and other constituencies still misunderstand foreign aid.

On the other hand, the previous chapters have pointed out some of what we have achieved in the past half century.

Overall, our Legacy in Agricultural Development reflects:

- » *Leadership in new concepts, designs and implementation mechanisms;*
- » *Moving beyond transfers of money and technology to address underlying socio-economic and organizational issues;*
- » *Mission operational flexibility that benefits from devolution of significant authorities to the field;*
- » *Contributions from a diversity of partners and alliances at many levels, matching our mechanisms to the skills of implementing partners;*
- » *Strong linkages to U.S. expertise and comparative advantage through public universities, private companies, national associations, foundations, NGOs and PVOs, other parts of the U.S. government as well as individual farmers;*
- » *Integration of diverse development themes;*
- » *Willingness to learn, adapt and adjust;*
- » *Finding pragmatic solutions to thorny problems; and*
- » *Farseeing vision of the possibilities.*

We have a better appreciation of the interface of agriculture and the environment. Taking a holistic approach to agricultural productivity growth by including soil conservation, water use and other environmental considerations is critical in the broader context of emerging climate change.

USAID is seeing agriculture in all its diversity, linkages and potential contribution to incomes and growth.

AN UNFINISHED LEGACY

The Agency's future legacy is still being written. Some promising activities are too new to have demonstrated a long-lasting impact, expanded in scale, or transformed lives and livelihoods; in other cases, sustainability may be in question. Given its focus on measurable accomplishments, this report does not include these new projects, many of which show great potential. Two notable examples of emerging areas are public-private partnerships in agriculture and new efforts to mitigate the effects of climate change.

Conversely, other possible achievement areas have stalled. A couple of decades ago, the Agency sought to use food aid as any other development resource to complement Development Assistance and Economic Support Funds and to fuse food aid and agricultural offices in field Missions. But today, food aid and agricultural offices operate on parallel tracks due to different mandates and the special characteristics of food as both commodity and resource transfer. Even the geographies of these two types of activities may differ. While most agricultural activities concentrate in areas

with strong agricultural potential, multi-year food aid development assistance programs are making a difference working with vulnerable populations in marginal areas.

There are other instances of unfinished developments. USAID has been a leader in microfinance in rural areas, but efforts to adapt and scale up this approach to serve agriculture have advanced slowly in the past generation.

The outcome of efforts in conflict zones like Colombia and Afghanistan to promote viable alternative agricultural livelihoods to drug processing and trafficking remains uncertain. The same can be said for non-conflict countries, like Bolivia.

Evaluations themselves sometimes lack the necessary rigor, such as “change from baseline” or “measure of impact.” This is likely due to the steady declines in evaluation budgets in previous decades until very recently and abandoning the project logical framework that USAID pioneered. Some of this report's writer-researchers had trouble finding recorded evidence of impact—numbers or trends—to corroborate the glowing testimonies of key informants.

Fortunately, this situation has turned around. USAID's renewed emphasis on evaluating performance and assessing impact is already producing objective evidence that its agricultural programs work. Looking at various value chain, trade and productive safety net projects in Africa, a new, study used quasi-experimental modeling methods to measure the impact attributable to USAID projects. According to the study, “the results demonstrate that successful

USAID-supported activities have an impact on significant numbers of smallholder households through increased incomes, reduced poverty, and/or improved livelihood status. Successful projects are cost-effective relative to poverty reduction benchmarks and alternative investments” outside of agriculture. USAID’s renewed embrace of rigorous performance monitoring, cost-effectiveness measures and impact assessments will make telling our story much easier the next time.

MOVING FORWARD

The year 2010 was a watershed year for international development policy in the United States. In May, President Barack Obama issued a National Security Strategy that reaffirmed the importance of development as a central pillar of our national security strategy.

In September, the first-ever Presidential Policy Directive on Global Development outlined principles to guide of international development policy and called for a new approach for planning and implementing foreign assistance.

In December, the first-ever Quadrennial Diplomacy and Development Review looked at the mandates and capacities of the State Department and USAID to ensure that these core agencies of American civilian power work more effectively and in tandem.

Concurrent with global development’s reemergence as a central component of America’s foreign policy, there is an increased focus on agriculture as a means to make a measurable and sustained impact in peoples’ lives. This new focus on agriculture started in the George W.

Bush administration’s Global Hunger and Food Security Initiative and is expanded in the current administration’s Feed the Future Initiative. The Obama administration has pledged \$3.5 billion toward this whole-of-government effort that, as designated by the QDDR, is led by USAID. A new, widely-vetted and acclaimed Feed the Future Initiative Research Strategy is ready for implementation.

At the launch announcement for Feed the Future, the State Department outlined five assets that will help the development community meet the growing challenges of the future:

- » First, there is an accelerating global commitment to cut hunger and poverty over the next five years.
- » Second, country-level and international institutions, already in place, are redirecting their efforts and energies towards common research programs to improve agricultural productivity.
- » Third, more groups are enlisted in this effort; USAID has been joined by a coalition—formal and informal—of universities, non-governmental organizations, private corporations, international foundations and even the U.S. military, alongside national governments and community and producer organizations.
- » Fourth, science and technology continue to march forward with advances like biotechnology that produces higher-yielding, disease- and pest-resistant varieties and game-changing information and communications technologies that remove barriers to

distance and knowledge by delivering agromonic advice and market news anywhere. Global markets offer new jobs and export opportunities in agriculture, but technical assistance may be required for helping to meet quality and safety standards.

- » And fifth, USAID's leadership of the U. S. government's Feed the Future initiative and growth of its technically-skilled agricultural staff demonstrate our commitment to agricultural-led growth.

The *2008 World Development Report* notes that the parameters of aid in agriculture are well known. Through many years and countless projects, the development community has a clear understanding of what works—and what doesn't. USAID has played a central and irreplaceable role in building this database of knowledge. One of the core development objectives in the *USAID Policy*

Framework, 2011-15 is to “rekindle the power of transformational agriculture.” Thus, the Agency is poised to make even greater contributions in the years ahead.

Today, USAID is focused on the critical issue of gender in production, marketing and consumption decisions. Similarly, the Agency is committed to integrating agriculture with natural resources management, climate change and nutrition. In USAID's vision, a modern agricultural sector must be economically efficient and both socially and environmentally sustainable. This can only be achieved by pushing the frontiers of research and development, on the one hand, and by maintaining robust field programs designed and managed by a strong cadre of agricultural development staff on the other. With this vision and its committed staff, over the next half-century, USAID will continue forward.



MOHAMMED GHANI KHAN

AT LEFT Multan, Pakistan, December 3, 2010: Punjabi farmers returning home after receiving 50 kg sacks of wheat seed, fertilizer, and vegetable seed as part of USAID's \$62 million program post-flood wheat distribution program.

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