

INTERNATIONAL DEVELOPMENT ASSOCIATION



# Agriculture

AN ENGINE FOR GROWTH  
AND POVERTY REDUCTION

IDA at WORK



THE WORLD BANK

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SUSTAINABLE DEVELOPMENT NETWORK



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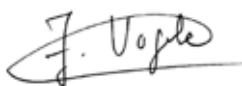
In this first decade of the 21st century, 2.1 billion people still live on less than \$2 a day and three out of every four of those poor people live in rural areas. Most of them depend on agriculture for their livelihoods.

*The World Development Report 2008: Agriculture for Development* highlights agriculture's contribution to development and demonstrates that agricultural growth can have two or four times the poverty reduction impact on the poorest members of society compared to non-agricultural growth.

It concludes that investment in agriculture has the most potential to generate economic growth where agriculture is a large share of GDP and most of the poor are in rural areas. As the majority of low income countries served by the World Bank's International Development Association (IDA) fall within that category, investment in agriculture is an especially critical driver of economic growth within IDA countries.

Increasing agricultural productivity, particularly in smallholder farming, and improving livelihoods, food security, and environmental resilience are priorities for creating sustainable agricultural growth. This brochure showcases the expansion and variety of agricultural lending which is currently taking place and highlights the positive economic benefits in countries with increased agricultural lending.

This renewed enthusiasm for agriculture is a welcome recognition of the very close nexus between investment in agriculture and reducing poverty for millions of the world's poorest people. It reinforces the message that if we are to halve the share of people suffering from extreme poverty and hunger by 2015, investing in agriculture is vital.



**Juergen Voegelé**

*Director, Agriculture and Rural Development*

The World Bank

## IDA at WORK

# Agriculture: An Engine for Growth and Poverty Reduction

Agriculture is critical to achieving global poverty reduction targets. It is still the single most important productive sector in most low-income countries, often in terms of its share of GDP and almost always in terms of the number of people it employs. In countries where the share of agriculture in overall employment is large, broad-based growth in agricultural incomes is essential to stimulate growth in the overall economy, including the non-farm sectors selling to rural people. Research has shown that every dollar of growth from agricultural products sold outside the local area in poor African countries, leads to a second dollar of local rural growth from additional local spending on services, local manufactures, construction materials, and prepared foods.

Recently, agriculture has been developing at an accelerated rate due to renewed strategic cooperation in the international community. The International Development Association (IDA), the part of the World Bank that provides grants and interest-free credits, has made a significant contribution to that trend in the poorest countries, particularly in Africa, thanks to its uniquely coordinated combination of financial resources, technical expertise, and support for improved policies. IDA has also fostered considerable expertise in dealing with the emerging challenges in this sector stemming from both new opportunities—such as growing markets for tropical high value produce—and new threats—such as rapidly rising food prices and avian flu.

Due to a combination of factors, global food stocks are at one of the lowest levels on record in per capita terms in 2008 after a steady decline since the late 1990s. Significant grain spikes occurred in early 2008, resulting in sharp increases in staple food costs in many developing-country markets. The price for inputs for food production such as fuel and fertilizer had tripled in the 18 months following

January 2007. This led to a renewed attention on agriculture and on the search for integrated solutions to address food security concerns to mitigate the adverse effects of rising food prices. To address this crisis, IDA has provided considerable additional resources to countries through new operations or restructuring of existing operations.

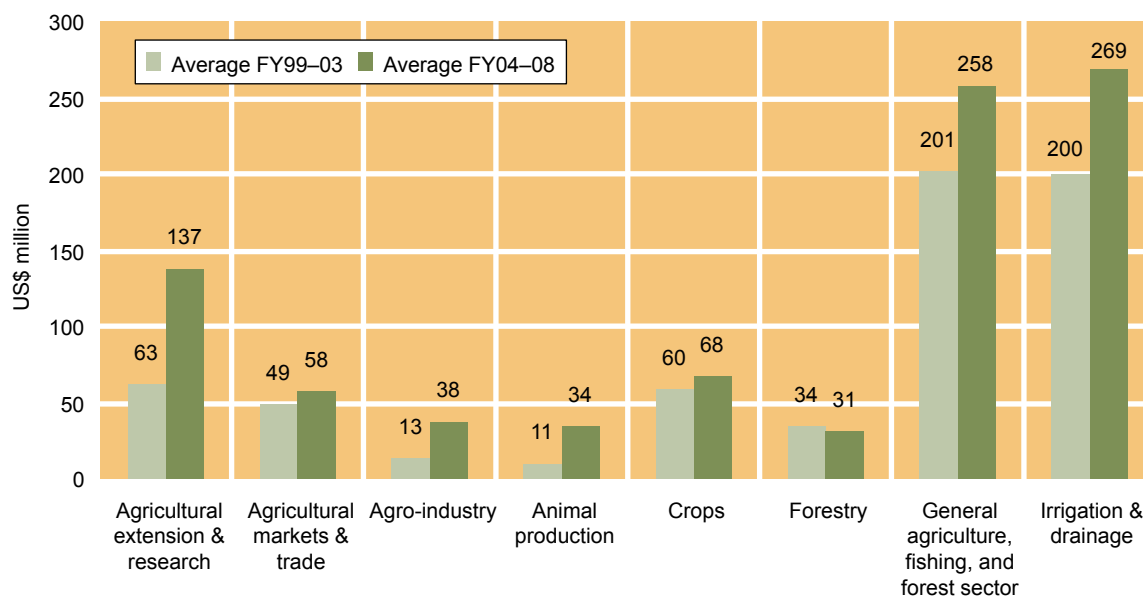
## IDA'S CONTRIBUTION

### Increased lending.

Over the past nine years, the IDA allocation to agriculture fluctuated between US\$305 million in FY00 and US\$1,094 million in FY08, indicating both high annual variability and a significant upward trend in agricultural lending over the period. While lending figures have increased, agriculture's share of total IDA lending has remained static at about 9 percent. The largest share of resources for agriculture has gone to Africa (44 percent in FY04–FY08, up from 38 percent in FY99–FY03); South Asia was the second largest beneficiary.



## IDA Annual Commitments by Sub-sector, Average FY99–03 and FY04–08 (US\$ million)



Since FY99, irrigation and drainage and general agriculture together represent about 60 percent of IDA funding for agriculture (see figure). The ‘general agriculture’ category largely relates to lending in the sector through poverty reduction support credits (PRSCs) and other multi-sector development policy lending.

### Enhancing agricultural growth.

The positive impact of IDA’s assistance to agriculture becomes apparent when one compares the sector’s overall performance in IDA countries that borrow for agriculture, to that of IDA countries that do not. Naturally these outcomes are also affected by actions and events beyond the influence of the World Bank. There may also be what economists call “selection bias”: countries that borrow for agriculture are more likely overall to have good agricultural resources and are more likely to spur agricultural growth—regardless of borrowing—than those that do not.

More broadly, IDA countries that took credits for agriculture experienced much faster economic growth overall and agricultural productivity growth per worker than IDA countries that did not take credits for agriculture. While these outcomes are inconclusive, the results in the table are a significant indicator that borrowing from IDA can enhance agricultural growth.

### Improving outcomes through strategic dialogue.

IDA investment has shown an overall upward trend from FY99 to FY08, which parallels improvement in the overall lending to agriculture and in the quality of interventions. As evaluated by the Bank’s Independent Evaluation Group, a steady improvement was observed in the performance of completed projects in the sector in FY04–FY08 (82 percent were rated satisfactory) compared to FY99–FY01 (only 59 percent of the projects were rated as having a satisfactory outcome).

### Real GDP Growth<sup>1</sup> Per Capita Compared to Growth in Agriculture Value Added Per Worker in IDA Countries With and Without Agricultural Credits, 1993–95 to 2003–05 (in %, per year)

Growth	IDA Countries with credits for agriculture N=53 <sup>3</sup>	IDA Countries without credits for agriculture N=14 <sup>4</sup>
Overall GDP per capita (constant 2000 US\$) <sup>3</sup>	2.2	1.9
Agriculture value added per worker (constant 2000 US\$) <sup>4</sup>	2.0	0.3

Source: World Bank Indicators, 2007.

1. Compound annual growth rates between midpoints of three-year averages.
2. Includes all countries that had active IDA projects in agriculture during the periods of time identified.
3. Data not available for 3 of 53 IDA countries with credits for agriculture and 2 of 14 IDA countries without credits for agriculture.
4. Data not available for 7 of 53 IDA countries with credits for agriculture and 4 of 14 IDA countries without credits for agriculture.

Increased concern in IDA countries about the earlier poor-performing agricultural projects combined with a fuller global understanding that agriculture is particularly important to growth and poverty reduction in IDA countries ultimately led to a virtuous circle of strategic dialogue and improved projects.

In 1997, staff working on rural development throughout the World Bank helped draft a sector strategy paper, *Rural Development: From Vision to Action*. The strategic dialogue was further pursued with the World Bank's developing country borrowers in all regions with the endorsement in FY02 of the Bank's rural development strategy, *Reaching the Rural Poor*, which further stressed the need to integrate the lessons of past experiences and scale-up successes and to improve upstream analytical work and quality at entry.

More recently, the World Development Report 2008: *Agriculture for Development* (WDR 2008) was endorsed by donors and, for the first time since the 1980s, led to a broad, renewed consensus on the importance of agriculture for development. WDR 2008 called for greater investment in agriculture and

warned that the sector must be placed at the center of the development agenda if the goals of halving extreme poverty and hunger by 2015 are to be realized. Among the emerging messages are the need for more donor support to agriculture and rural development sectors, for leveraging global partnerships, and for a multi-sectoral and strategic approach to increasing rural employment as well as public policy that creates an enabling environment for market-led responses.

A strategic and coordinated approach is being adopted with partners to address the rising food crisis which is posing a serious threat to food security in developing countries, under the coordination of the United Nations Secretary-General. In response to the crisis, ministers from more than 150 countries meeting in Washington in April 2008 endorsed a "New Deal on Global Food Policy," proposed by the World Bank. The New Deal embraces short, medium and long-term responses including: safety nets such as school feeding, employment programs, and conditional cash transfers; increased agricultural production; a better understanding of the impact of

biofuels; and action on the trade front to reduce distorting subsidies and trade barriers. The World Bank's Global Food Crisis Response Program (GFRP) was initiated in 2008 and allows for a rapid and flexible Bank response that supports the UN Task Force on the Global Food Crisis (established in April 2008 in Berne) and the World Food Program (WFP)'s work on the emergency delivery of food and relief operations to the worst-hit countries. The Bank has created a \$1.2 billion rapid financing facility for Bank funds and a Multi-Donor Trust Fund that will speed up assistance to the neediest countries, most of which receive IDA financing.

At the same time, new challenges such as climate change will have far-reaching consequences for agriculture that will disproportionately affect the poor. Greater risks of crop failures and livestock deaths are already imposing economic losses and undermining food security, and they are likely to get far more severe as global warming continues. Adaptation measures are needed urgently to reduce the adverse impacts of climate change, and these measures will be facilitated by concerted international action and strategic country planning. As a major source of greenhouse gas (GHG) emissions, agriculture also has much untapped potential to reduce emissions through reduced deforestation and changes in land use and agricultural practices. The World Bank Group has been preparing a Strategic Framework on Climate Change and Development (SFCCD) which will articulate how to integrate climate change into other development challenges. Reflecting the multi-sectoral and multidimensional nature of the challenge, the SFCCD will encompass activities in many sectors including agriculture.

### **A long-term, comprehensive approach.**

IDA's comparative advantage lies in its unique



capacity to back its financial support with other mechanisms designed to promote strategic focus, capacity building, inclusive development, and coordination of investment and policy reform activities in client countries. IDA Development Policy Lending (DPL) to agriculture almost doubled after the adoption of a new rural strategy (from an annual average of US\$82 million in FY99-03 to US\$187 million per year in FY04-FY08). Development policy operations generally provide quick-disbursing financial assistance in support of a range of development outcomes that require underlying medium-term policy and institutional activity. This is critical in small-holder agriculture where a multiplicity of interventions need to occur in sequence to allow farmers to both produce more and sell into expanding but more demanding agricultural markets.

**Working across sectors.** For example, sector work on Drivers of Rural Growth in Nicaragua demonstrated that improved rural roads are essential to link farms to markets; and that education and health services are required not just to improve welfare directly, but also to increase agricultural productivity

### Successful Projects in Africa

The Bank has had a number of successes in IDA-funded operations for agriculture. Three completed African projects are highlighted here.

The **Mali Office du Niger Consolidation Project** assisted the government with the reform of the irrigation agency (Office du Niger), the rehabilitation and modernization of irrigation structures, and agricultural policy reforms (rice market liberalization and land tenure). As a result, liberalization of the rice trade and markets was achieved and sustained. The Office du Niger was restructured and its financial health restored. Reduction in milling costs saved the government US\$1.6 million per year and reduced milling costs to farmers and consumers by US\$6 million per year. The water fee collection rate increased from 60 to 97 percent, with water fees retained in the areas where they were collected and at least half used for maintenance. Yields increased from 1.8 to 5.5 MT/ha and real per capita income increase by US\$70 per year in the project area. The success of the project led other donors to finance further perimeters in successive tranches—the IDA investment leveraged 250 percent additional investment from other donors.

The **Cameroon National Agricultural Extension And Research Program Support Project** strengthened producer organizations and improved credit, inputs, and marketing services by facilitating links between the groups, financial service providers, and the private sector. It created a network of 58,699 contact groups that represent at least 50 percent of all farm families (from 15 percent prior to the project) to link up with the agriculture research and extension system. As a result, agriculture productivity increases were seen for many of the major crops—for instance maize yields increased from 1.3 tons/ha to 2.9 tons/ha, and cassava from 3 tons/ha to 13 tons/ha. The beneficiary assessment showed that 93 percent of women in the project zones received assistance from the project. About 40 percent of the subprojects implemented were geared to the needs of women, exceeding the 30 percent that was expected in the planning phase.

The **Mauritania Rainfed Natural Resources Management Project** reforested and protected common land, cut local crop production losses by 30 percent, and increased yields of sorghum—the primary rainfed crop—through investments in soil and water conservation, such as aerial tree-seeding, rehabilitation and protection of retention dams. The impact analysis showed that yields averaged 800 kg/ha with the project, but they would have been 100 kg/ha without the project. Increased opportunities for the sustainable harvesting of gum arabic have significantly slowed male out-migration in some villages. Women have benefited from closer access to water, resulting from some subprojects and also from cash income from village gardens and market stalls.



and provide labor mobility. In Bangladesh, research found that certain road improvement projects led to a 27 percent increase in agricultural wages and 11 percent increase in per capita consumption. IDA's experience in multiple areas, under a wide variety of often difficult natural conditions, allows it to play a unique role in promoting synergies across sectors.

**A long-term vision.** As of 2008, IDA, endowed with a multi-year lending capacity, is still one of the largest single providers of resources for agricultural development. It is also backed by a strong institutional capacity for lesson-learning, monitoring and evaluation, policy analysis and technical assistance with experience across the developing world. As such, IDA is especially well-placed to promote dialogue on the longer-term development agenda, and to convene multiple stakeholders and donors to coordinate development programs and assistance strategies.

As IDA countries are heavily reliant on natural resources for their development, the integration of many sectors in consistent rural development strategies gives IDA the ability to ensure that the cumulative use of natural resources by the various sectors—as well as their respective impacts on natural resources—is sustainable both socially and environmentally.

**Country-wide impact.** One of the four main thrusts of the Reaching the Rural Poor strategy is support to preparation of National Rural Development Strategies (NRDS), with the intention that they influence Poverty Reduction Strategies (PRSPs) and Country Assistance Strategies (CAS) in IDA countries. In this way, NRDSs provide a key link between the Bank's rural development strategy and country-level programs. Since the approval of Reaching the Rural Poor in

2002, 36 IDA client countries have completed national rural development strategies, supported either directly or indirectly through key analytical contributions.

**Global partnership.**

The harmonization of various donor efforts in rural development in the poorest countries of the world is promoted by, among others, the World Bank-supported Global Donor Platform for Rural Development,

National Rural Development Strategies (NRDS) Completed in IDA Countries FY02–08	
Africa	Benin, Lesotho, Niger, Nigeria, Sierra Leone, Tanzania, Uganda, Togo, Madagascar, Cameroon, Mozambique, Zambia, Ethiopia, Dem. Rep. of Congo, Zimbabwe*, Angola, Liberia
East Asia & Pacific	Mongolia, Vietnam, Papua New Guinea*, Cambodia, Solomon Islands
Europe & Central Asia	Albania*, Moldova, Uzbekistan*, Kyrgyz Rep., Serbia*
Latin America & Caribbean	Bolivia*, Nicaragua, Haiti
Middle East & North Africa	Yemen
South Asia	Sri Lanka, Nepal, India*, Bangladesh

Source: World Bank, Agriculture and Rural Development unit.

\* Indicates “blend” countries that borrow both from IDA and the IBRD.

established in 2004. In 2005, the platform started piloting harmonization efforts in line with the Paris Declaration on Aid Effectiveness in four IDA countries—Burkina Faso, Cambodia, Nicaragua, and Tanzania. The Bank also supports critical global public goods by funding and collaborating with the Consultative Group on International Agricultural Research (CGIAR).

Developing country efforts to reach international markets with agriculture products are supported by the Standards and Trade Development Facility, established with the help of the World Bank and housed at the World Trade Organization (WTO). To address the global crisis in marine fisheries, the Bank in association with key donors and stakeholders established the Global Program on Fisheries (PROFISH) to improve sustainable livelihoods in the fisheries sector and to make concrete progress toward meeting the goals of the World Summit on Sustainable Development (WSSD). In forestry, the Bank is working to better coordinate partnership activities, in order to increase the financing and improve the governance and positive impact of forest sector activities. Finally, the World Bank/UN Food



and Agriculture Organization (FAO)-Cooperative Program plays an important role in promoting agricultural development in IDA countries through the provision of joint technical support for investment operations and lesson-learning, including an initiative aimed at mainstreaming gender into agricultural operations.

### The CGIAR

The Consultative Group on International Agricultural Research (CGIAR) is a strategic alliance of countries, international and regional organizations, and private foundations supporting international agricultural centers that work with national agricultural research systems, the private sector and civil society organizations. The alliance promotes scientific research and research-related activities in the fields of agriculture, forestry, fisheries, policy, and environment to achieve sustainable food security and reduce poverty in developing countries.

### Lessons learned.

The Bank has invested considerable effort to learn the lessons from its past strategies and reflect those lessons in its current work.

WDR 2008 stated that agriculture is critical to overall growth, food security, and poverty reduction in agriculture-based countries, most of which are in Sub-Saharan Africa. Recommendations include:

- Improving smallholder competitiveness in high- and medium-potential areas—where returns to investment are highest—and improving livelihoods, food security, and environmental resilience in remote and risky environments are priorities.

## Environment Projects Yield Agricultural Results

The **Tanzania River Basin Management & Smallholder Irrigation Project** addressed water-related environmental concerns at the national level, with focus on particular problems in the two largest basins. It targeted improving water access and use by low income smallholder farmers in 15 irrigation schemes through better water management, higher quality infrastructure, and improved stakeholder participation in water management. Among other highlights of the project, agricultural yields for more than 5,000 families doubled and household incomes tripled. 1,674 farmers were trained in scheme water management, crop production techniques, agro-business and financial management and leadership skills. Average rice yields in project areas more than doubled.

In Senegal the **Sustainable Woodfuels Project** adopted a comprehensive approach, tackling both woodfuels' supply and demand, and demonstrated that the production and marketing of traditional biomass fuels can be stabilized, while arresting deforestation, contributing to ecological conservation and increasing village incomes. At the project's close in 2004, more than 20 percent of Senegal's woodfuel consumption was derived from sustainably managed forests. That share has increased to 50 percent today with the introduction of sustainable green wood cutting in an eight-year rotation program.

Two projects set out to restore China's heavily degraded **Loess Plateau** through one of the world's largest erosion control programs with the goal of returning this poor part of China to an area of sustainable agricultural production. More than 2.5 million people in four of China's poorest provinces were lifted out of poverty. Through the introduction of sustainable farming practices, farmers' incomes doubled, employment diversified and the degraded environment was revitalized. Among other highlights of the project, natural resources were protected; food supplies were secured; the project significantly contributed to the restructuring of the agricultural sector; and, even in the lifetime of the project, the ecological balance was restored in a vast area considered by many to be beyond help.

- A multi-sectoral approach is needed to capture synergies between improved technologies, sustainable soil and water management, institutional support, and human capital development—all linked to market development.
- Decision making on many actions is best decentralized in order to tailor them to heterogeneous local conditions, but others need to be coordinated across countries to provide an expanded market and to achieve economies of scale in such services as research and development.

Improving the quality and impact of operations has resulted in regional rural portfolio improvement plans; appointments of portfolio managers; emphasis on timeliness; closer management review of project progress and completion reports; and, a growing number of quality support training sessions ("clinics") to help staff improve the conceptualization and technical design of agricultural and rural projects. These clinics draw on the experience and expertise across IDA-funded activities and also, more recently, on external expertise as well.

### LOOKING AHEAD

#### **Agriculture-led growth remains key for IDA countries.**

As described in detail in the WDR 2008, the Millennium Development Goals (MDGs) simply cannot be met in most low-income countries, especially in Africa, without a productivity revolution in agriculture. The WDR 2008 also presents a robust analysis describing how agricultural growth has two to four times the poverty-reduction impact on the poorest people than non-agricultural growth.

#### **Long-term structural changes are occurring.**

As the private sector mobilizes resources to tap new opportunities, it is vital to find ways to facilitate the inclusion of the rural poor in these plans. At the same time, public sector investments are now smaller and often channeled through local community groups rather than central or state governments. Agriculture and rural poverty investments for the poor increasingly involve microfinance, community empowerment and public-private-civil society partnerships for inputs, marketing, and research.



#### **Agricultural Development that Benefits the Poor**

Prior results of this learning process were encapsulated in the World Bank's 2002 *Rural Strategy, Reaching the Rural Poor*, which emphasized the following elements for a strategic approach to pro-poor agricultural development:

- Take into account the fact that agriculture both drives and is driven by the overall economic policy environment.
- Invest in improving agricultural productivity through the application of science.
- Add value through promoting diversification into higher value commodities for which demand is growing rapidly.
- Move from a primary commodity focus to adding value along the entire supply chain.
- Build on the different strengths of different types of farms.
- Mobilize the strengths of diverse partners such as the private sector, civil society, and local government.

## High Profile Issues

- **High Food Prices.** Rapidly rising food prices pose a serious threat to food security in developing countries. International grain prices rose steadily between 2002 and mid-2007, followed by a more accelerated increase in late 2007. Significant grain price spikes then occurred in early 2008 resulting in sharp increases in staple food costs in many developing country markets. Meanwhile the price of inputs for food production such as fuel and fertilizer tripled in an 18-month period since January 2007, undercutting the profitability of smallholder farmers. Due to a combination of factors, global food stocks are at one of the lowest levels on record. Without an adequate collective response, the rise in global food prices could result in an additional 100 million people in low income countries falling below the poverty line. Soaring prices have been a contributing factor to civil unrest in nearly 40 countries and could reverse recent progress in reducing hunger and malnutrition and thereby reduce the likelihood of meeting the Millennium Development Goals.
- **The “Livestock and Aquaculture Revolution.”** Developing countries as a whole went from producing and consuming 36 percent of the world’s meat in the early 1980s to more than 60 percent in 2008. This has contributed to improved livelihoods for urban and rural poor but is also creating major environmental and public health threats. Aquaculture, growing at an annual average rate of 10 percent since the mid-1980s, now accounts for more than 40 percent of global food fish consumption. More generally, demand for high-value agriculture—such as livestock, fisheries, and horticulture—is growing much faster than the rural population in developing countries, so there is real potential for labor-intensive rural strategies that can greatly improve livelihoods. However, the demand for safety and quality also threatens to exclude smallholders from sectors in which they have been traditionally dominant unless targeted interventions can help them meet the new requirements of growing markets.
- **Emerging diseases.** The avian flu crisis is not the first zoonosis to threaten human health and country economies, and it will not be the last. With regularity, an emerging livestock-related disease—such as the Nipah virus, Bovine Spongiform Encephalopathy (BSE), Severe Acute Respiratory Syndrome (SARS), and Highly Pathogenic Avian Influenza (HPAI)—threatens the global human population. IDA is a key partner in an international effort to combat avian flu. It is working to strengthen institutional capacities in countries to coordinate, monitor, and implement appropriate measures to contain present threats from livestock-borne diseases and avert future ones.
- **Biofuels** may hold the potential for new economic opportunities for IDA countries, but they also present challenges for sustainable land, water, and forest use; and, for trade. Making cost-effective decisions for biofuel investment and policy will require a clear strategy and incorporation of lessons of experience.
- **Biotechnology** similarly offers hope for improved agriculture productivity and environmental impacts under both intensified systems as well as in stressful environments (e.g. drought, pests) and holds promise for biofortification of food staples to meet the nutritional needs of the population. However it also raises the need for sound bio-safety and product tracking systems to ensure compliance with safety standards in different agricultural markets.
- Agricultural **trade** subsidies will continue to shape the WTO and other trade forums. The Bank will help countries better handle trade negotiations and meet the sanitary and phyto-sanitary standards set by importing countries.
- **Gender** integration into agriculture is a high priority to enhance the development outcomes and impact of the agriculture operations.
- Adaptation to **climate change** requires work beyond clean energy. Intensified (as opposed to “extensified”) agriculture that makes better use of limited land and water resources through technology, policy, institutional, and management improvements will help developing country farmers maintain productivity in the face of climate volatility. Innovative risk management mechanisms, such as weather risk insurance, will help farmers retain their livelihood resources under the same conditions.
- To arrest the depletion of **natural resources**—including land, water, forests, and marine fisheries—IDA will focus on improving their governance and on introducing cutting-edge instruments such as payments for environmental services and carbon finance.

### IDA lending is adapting to these shifts.

Within the Bank, these shifts in client perspective are boosting demand for skill-intensive technical assistance that combines access to investment resources, knowledge transfer and capacity building to profit from emerging opportunities and cope with emerging threats. This trend translates into growing demand for IDA credits for agriculture.

As agriculture remains vital to the livelihoods of the rural poor, continued globalization and economic integration bring both opportunities and challenges. Opportunities arise from new demand patterns and market possibilities propelled by dietary diversification in the rapidly expanding cities of developing countries and soaring new export markets for fish, meat, fruits, vegetables, and ornamental plants or cut flowers. Challenges arise from increased requirements in terms of food safety, bio-safety, and intellectual property rights; as well as sanitary, quality, and reliability standards necessary to compete in the fast growing segments of developing country markets.

Rapidly rising food prices also pose a serious threat in developing countries that requires immediate support from the international community in order to reduce the impact on the poor and vulnerable.

Recently approved IDA agricultural projects tend to reflect the World Bank's rural strategy. This means using improved agricultural production as an engine of growth and economic diversification along private sector supply chains in the context of policy and regulatory reforms, infrastructure development, institution-building and skills development by the public sector. Examples include the Zambia Agricultural Development Support Project and the Burkina Faso Agricultural Diversification and Support Project. In addition, new approaches have been promulgated for natural resource management, such as the 2004

Bank strategy entitled Sustaining Forests. The latter emphasizes project activity that channels rising demand for tropical forest products into both ecologically sustainable practices and inclusive livelihood strategies for poor people dependent on forests. New projects will also need to be developed to address other "high-profile" issues that derive from the emerging threats and opportunities facing IDA country agriculture.

IDA as a partner in development should continue to invest in key international public goods that facilitate improved agricultural production, including enhanced productivity and better governance over the use of natural resources for the benefit of the overall population. Beyond production and resource management, it is vital to assist clients with market access. Enhanced participation in the ongoing rapid development of agriculture and natural resource-related value chains requires building the capacity of both poor people and poor countries to meet ever more stringent reliability, quality, bio-safety, sanitary or phyto-sanitary, and food safety standards, and building the institutions that allow them to achieve market recognition for better compliance in terms of higher prices and larger sales volumes.



## Dam Project Improves Livelihoods and Security in Armenia

### Challenge

Prior to 1999, proper surveillance and maintenance procedures were lacking for 87 dams in Armenia. As a result, about 34 percent of all irrigated land in Armenia—or 68,000 hectares—was not getting reliable irrigation. Agriculture contributes 18 percent of Armenia's gross domestic product and employs about 46 percent of its labor force—many of whom were suffering from substandard irrigation. More importantly, there was a high possibility of dam failure, which would result in devastation downstream. For this reason, 360,000 people and 680 square kilometers of land and were considered at risk.

### Approach

IDA's initial Dam Safety Project aimed to tackle this challenge head-on by:

- Immediately rehabilitating the 20 dams considered to be at highest risk, and
- Establishing dam-safety measures, such as setting up instrumentation and monitoring devices, early warning systems, and telecommunications systems.

This first project led to a second Dam Safety Project in 2004, which extended the program to the entire country and included all other dams at risk and improved dam safety measures.

### Results

**Over 500,000 people (more than 15 percent of the population) living downstream of these rehabilitated dams are now safe. Likewise, Armenia's infrastructure located downstream is no longer considered at risk.**

### Highlights:

- Rehabilitated 69 (plus five ongoing) out of 87 dams in the entire country,
- Developed Emergency Preparedness Plans for all sites,
- Installed Emergency Warning Systems in 175 villages,
- Strengthened the capacity of the Emergency Management Agency, which now conducts effective outreach campaigns; and strengthened the Dam Maintenance Enterprise,
- Secured a reliable source of irrigation water supply for the farmers, and
- Ultimately secured the at-risk locations downstream, including varied socioeconomic infrastructure.

### IDA Contribution

IDA offered prolonged support, during an 8-year period from 1999 to 2008. It contributed \$26.6 million under the Irrigation and Dam Safety Project and \$6.75 million under the Irrigation and Dam Safety II Project, which began in 2004.

### Next Steps

Institutional reform of the agricultural water sub-sector is ongoing in Armenia, which could have implications for the country's system of dams. It is important for the Government to continue to dedicate the necessary resources to managing its dam system. The management of smaller dams should be transferred to Water Users Federations and Associations as soon as they are geared up in terms of financial and technical capacity.

## Reclaiming a Viable Rural Economy in Egypt

### Challenge

Desert covers more than 95 percent of Egypt. With less than five percent of the country habitable, almost all of Egypt's 72 million people live along the Mediterranean Sea and the Nile River. These crowded conditions—including Cairo, which is among the earth's most densely populated cities—will worsen as the country's population is set to double by 2050. While agriculture only contributes about 14 percent to Egypt's income, it employs 32 percent of the labor force. For millions of Egyptian farmers, however—particularly those in the Nile Delta—yields and incomes decline sharply as salt builds up in the soil. In fact, of Egypt's total farmland of about 7.8 million feddans (3.3 million hectares), more than 25 percent exhibit salinization problems. In the cultivated lands of the northern and eastern Delta region, more than 60 percent are salt-affected.

### Approach

The East Delta Agricultural Services Project aimed to provide support services to facilitate the settlement of about 29,000 low-income farm families on about 130,000 feddans of reclaimed lands in the East Delta—and support increased agricultural production. The total project area is located east of the Delta between the Suez Canal and Lake Manzala. It comprises about 200,000 feddans (85,000 ha) in the four governorates of Port Said, Ismailia, Sharkiya, and Dakahliya. Analysis has indicated that these soils are not polluted beyond repair. Once fully reclaimed they are capable of producing crop yields similar to those in the Delta, given the same water allocation and quality. Project activities include provision of agricultural services, including extension, adaptive research, and community development; on-farm infrastructure including tertiary irrigation and field drainage; and drinking water supplies.

### Results

**Project activities led to increased farm incomes and laid the basis for the development of a viable rural economy in the East Delta area.**

### Highlights:

- **Steady increase in the area under cultivation.** 116,944 feddans were cropped in the winter season 2007-2008, which represents 9 percent of the target area (of 130,000 feddans) and an increase of 13 percent over the winter 2006-2007 season.
- **Steady increase in crop yields**, such as wheat, barley, sugar beet, rice, cotton, and amshout.
- **Very successful community development activities:** The Community Development Unit (CDU) is involved in a range of activities, which promote village cooperation. Thus far, 14 Community Development Associations (CDAs) have been formed, as well as more than 328 Irrigation Water User Associations (WUAs) and 8 Water Users Unions (WUUs), surpassing the end-of-project target. Community men and women have been trained in various income-generation skills, such as baking, mushroom production, handicrafts, and dairy products. Some CDAs are already receiving grants from the Ministry of Social Affairs to support their activities.
- **Progress with infrastructure activities:** The project built a large drinking water treatment plant, three sanitary sewerage plants, and rehabilitation/extension of compact units for drinking water treatment.



### IDA Contribution

The IDA credit of approximately \$15 million became effective in January 1999 and closes in December 2008. IFAD is co-financing, providing funding of approximately \$25 million, with a project closing date of March 31, 2008.

### Next Steps

The El Radwan village sewerage network and treatment plant was handed over to the Port Said Governorate, and the Governorate has begun operation of the system. Arrangements have been made for the eventual hand-over of the main water treatment plant in South Hussainia to the El Sharkiya Water Company, and the company has embedded staff in the team supervising the construction of the waterworks.



Project activities led to increased farm incomes and laid the basis for the development of a viable rural economy in the East Delta area.

## Sustainable Farming on China's Loess Plateau Helps Double Farmers' Incomes

### Challenge

Home to more than 50 million people, the Loess Plateau in China's Northwest takes its name from the dry, powdery, wind-blown soil. Centuries of overuse and overgrazing led to one of the highest erosion rates in the world and widespread poverty.

### Approach

Two projects set out to restore China's heavily degraded Loess Plateau through one of the world's largest erosion control programs with the goal of returning this poor part of China to an area of sustainable agricultural production.

### Results

**More than 2.5 million people in four of China's poorest provinces—Shanxi, Shaanxi and Gansu, as well as the Inner Mongolia Autonomous Region—were lifted out of poverty. Through the introduction of sustainable farming practices, farmers' incomes doubled, employment diversified and the degraded environment was revitalized.**

### Highlights:

- Incomes doubled: People in project households saw their incomes grow from about US\$70 per year per person to about US\$200 through agricultural productivity enhancement and diversification.
- Natural resources were protected: Uncontrolled grazing, subsistence farming, fuel wood gathering and cultivation of crops on slopes had left huge areas of the Plateau devastated. The project encouraged natural regeneration of grasslands, tree and shrub cover on previously cultivated slope-lands. Replanting and bans on grazing allowed the perennial vegetation cover to increase from 17 to 34 percent.
- Sedimentation of waterways was dramatically reduced: The flow of sediment from the Plateau into the Yellow River has been reduced by more than 100 million tons each year. Better sediment control has reduced the risks of flooding with a network of small dams helping store water for towns and for agriculture when rainfall is low.
- Employment rates increased: More efficient crop production on terraces and the diversification of agriculture and livestock production have brought about new on-farm and off-farm employment. During the second project period, the employment rate increased from 70 percent to 87 percent. Opportunities for women to work have increased significantly.
- Food supplies were secured: Before the project, frequent droughts caused crops cultivated on slopes to fail, sometimes requiring the government to provide emergency food aid. Terracing not only increased average yields, but also significantly lowered their variability. Agricultural production has changed from generating a narrow range of food and low-value grain commodities to high-value products. During the second project period, per capita grain output increased from 365 kg to 591 kg per year.
- The project significantly contributed to restructuring the agricultural sector and adjusting to a market-oriented economic environment, while creating conditions for sustainable soil and water conservation.
- Even in the lifetime of the project, the ecological balance was restored in a vast area considered by many to be beyond help.
- Terracing required the development of roads that facilitated the access of vehicles and farm equipment and labor to these areas. Sediment control and capture transformed previously unproductive land into valuable cropping areas, helped increase

water storage for communities and agricultural use and reduced flood risk. Terraces have reduced labor inputs and allowed farmers to pursue new income-earning activities.

### IDA Contribution

- First Loess Plateau project: out of US\$252 million (actual project costs), IDA contributed US\$149 million; government/counterpart funding was US\$103 million.
- Second Loess Plateau project: IDA contributed US\$50 million; IBRD US\$99 million; and government/counterpart funding US\$90 million.
- The physical and economic transformation of the Loess Plateau offers the clearest demonstration of what can be achieved through close partnership with the government, good policies, technical support and active consultation and participation of the people. IDA resources—through direct investments, policy and technical assistance, training and capacity building—along with the efforts and behavioral change of the people in the project area, helped demonstrate the effectiveness of a model that improved the lives and livelihoods of more than 2.5 million people, and many more through replication.
- Training and support services helped enhance existing research and development capacity in dry-land farming techniques, grassland improvement, orchard and livestock management and impact monitoring and evaluation.

The projects' principles have been adopted and replicated widely. It is estimated that as many as 20 million people have benefited from the replication of the approach throughout China.



Through the introduction of sustainable farming practices, farmers' incomes doubled, employment diversified and the degraded environment was revitalized.

## Better Crops, Higher Incomes for Farmers in India's Karnataka Watershed

### Challenge

Five districts in Karnataka, India, were characterized as drought-prone and dominated by rain-fed agriculture around a narrow range of two to five crops. Average annual household income for the one million people who lived in the area was approximately US\$222. Groundwater availability was between three and four months. Common lands were deteriorating through poor management. Watershed development was largely delivered through a top-down, non-participatory model, resulting in little social mobilization. Self-help groups were weak and unable to build financial capital.

### Approach

- The project's primary development objectives are to improve the productive potential of selected watersheds and their associated natural resource base, and strengthen community and institutional arrangements for natural resource management in five districts in Karnataka, India.
- Project targets include addressing soil and water conservation needs across 432,000 ha of arable and non-arable lands by introducing new approaches for community-based participatory planning.
- The project is being implemented in three phases by the Department of Watershed Development, along with state, district and local non-government organizations working closely with participating communities.

### Results

**Soil and water conservation works have been completed on over 200,000 ha, improving average crop yields by about 24 percent and broadening crop diversity.**

### Highlights:

- Groundwater availability has improved to four to six months. Groundwater yields have increased by nearly 1,000 liters per hour, giving farmers greater choice of crops and in many cases, double cropping on arable lands.
- For communities where implementation has been completed, crop yields have increased by 24 percent over the baseline, cropping patterns have shifted to higher valued crops, and milk yields have been enhanced by 15 to 20 percent.
- Average annual household income has increased by about 66% to approximately US\$373. The increase in average income has contributed to a reduction in migration by about 70 percent. Young men no longer have to leave the community to find work.
- The project has already achieved its target of establishing 4,300 farmer groups and 6,600 new self-help groups to sustain participatory watershed management across 7,000 communities in 742 micro-watersheds. New participatory micro-watershed planning approaches have resulted in highly integrated micro-watershed plans being prepared by communities, who have greater ownership and commitment.
- Self-help groups, which have flourished with project support; have already mobilized more than US\$4 million in savings to help establish small businesses. The majority of members are women. More than 60 percent of the self-help groups are now linked to commercial financial institutions, leveraging additional credit for larger enterprise start-ups. Money-lenders are no longer a major force in these communities.
- The project has resulted in a new government policy for co-management of common lands in watersheds that will have long-term impacts on improved natural resource conservation and rural livelihoods. It has also helped strengthen decentralization.

### IDA Contribution

- Total project cost at time of approval was US\$127.6 million, with IDA providing a US\$100.5 million grant, the government providing US\$14.3 million, and beneficiary cash and in-kind contributions amounting to US\$12.8 million. After the tsunami of December 2004, US\$20 million from the original IDA grant were reallocated to finance an emergency recovery program.
- IDA played a key role in helping the government design a project to test new participatory approaches for integrated watershed planning and implementation. More meaningful engagement with communities is based on extensive capacity building, social mobilization and group formation, and the use of thematic maps for participatory watershed planning. The new model also draws in non-governmental organizations (NGOs) as active partners.

### Next Steps

- The project is being extended to allow activities in the final phases to be completed and fully achieve all project development objectives. The sustainability of the project benefits depends largely on the enduring strength of local institutions established and continued application by villagers of new agriculture and natural resource management techniques. Pooled group savings and revolving funds will support maintenance of natural resource assets on private and common lands, as well as helping finance new small businesses.
- The Minister of Agriculture has indicated that Karnataka state would welcome further Bank support to scale up the project to another five districts to entrench innovative participatory watershed management approaches more widely. The central government Ministry of Agriculture is adopting features of the project's innovative monitoring and evaluation system for all government watershed programs throughout India.



Soil and water conservation works have been completed on over 200,000 ha, improving average crop yields by about 24 percent and broadening crop diversity.

## Agricultural Technology Increases Yields & Incomes in Nicaragua

### Challenge

Agriculture is a key sector in Nicaragua. In the 1990s the government drastically reduced its intervention in agriculture, but this liberalization was not accompanied by the provision of credit or technical assistance to farmers. Few households had access to services, and most agricultural producers had no resources to invest in research or training in modern technologies. Agricultural research and extension activities lost relevance to the ongoing needs of the agricultural sector, as the links between researchers and farmers had atrophied during the previous decades.

### Approach

The Agricultural Technology project sought to address this problem by establishing an efficient, demand-driven agricultural technology, knowledge and innovation system. The focus of the project was mainly to provide rural households and communities with a broader access to sustainable agricultural, forestry and natural resource management services and innovations and to stimulate higher productivity.

### Results

**Over the project period, yields of basic staples (maize, beans and rice) rose by 23 percent on average, the largest increase within the six Central American countries. Farmer incomes in surveyed representative farms increased 25-84 percent.**

### Highlights:

- Maize productivity increased by 37 percent, and beans productivity by 63 percent between 1999 and 2003.
- Nicaragua now meets 85 percent of internal demand for basic grains certified seed.
- By the end of the project, one third of small and medium farmers were in direct contact with extension services, and 70-90 percent of them

were satisfied with the quality of services (as demonstrated by beneficiary surveys), and adopted recommended improved technologies. Over 68,000 producers benefited from project-financed services.

- In a survey of 200 farmers performed as part of project valuation, all reported at least a 60 percent productivity increase; 55 percent reported at least a 25 percent cost reduction; and 45 percent reported a 20 percent increase in sales price due to higher quality of production.
- Through competitive grant funds, over 240 new entities (NGOs, producer groups and others) got involved in agricultural research and services.
- The most important long-term effect of this project is increased food security, especially for the poorest.

### IDA Contribution

- As the key donor, IDA was able to leverage co-financing from bilateral and multilateral donors by creating a framework of assistance that many donors could support.
- Total project cost was US\$41.8 million of which IDA provided US\$24.04 million, the government US\$6.81 million and beneficiary communities US\$1.36 million. Co-financing was provided by the International Fund for Agricultural Development (US\$1.81 million) and the governments of Switzerland (US\$2.31 million) and the Netherlands (US\$4.56 million).

### Next Steps

Despite recent progress, the country continues to face many of the same challenges as at the start of the project. Project achievements need to be sustained and scaled up. A Second Agricultural Technology Project (US\$12 million), is focusing scarce IDA resources on effectively leveraging coherent external assistance for the whole rural sector.





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