



# Findings and Conclusions

**T**his study provides answers to three questions: Why has Bank investment in agricultural water management declined so precipitously? Are agricultural water projects relevant to the Bank's renewed focus on poverty alleviation and institutional and policy reform? What should be done to improve performance and relevance?

## **Changing Global and Bank Priorities**

Four factors account for most of the decline in lending for agricultural water management: (i) a shift in borrowers' priorities, (ii) realignment of lending with the Bank's strategy for poverty reduction, (iii) changing development objectives for agricultural water management, and (iv) increased use of low-cost approaches.

### ***Borrowers' Priorities Have Changed***

Agriculture's contribution to growth and employment continues to shrink, lowering policy makers' attention to agricultural policy and water management. Between 1980 and 2000 the share of agriculture in global GDP fell from 8 percent to 5 percent, but the regions with the most agricultural water management infrastructure saw an even greater decline. The share fell by a quarter, to 25 percent, in South Asia and halved, to only 13 percent, in East Asia and Pacific. The only region where agricultural GDP remained unchanged was Sub-Saharan Africa (17 percent); and in the Middle East and North Africa it actually increased, from 10 percent to 14 percent. Among all low- and middle-income

countries, agriculture's value added to growth in the 1990s shrank to about half of that added by the industry and service sectors, and about a quarter of that added by exports of goods and services. Food security concerns that were the focus of agricultural development in the 1960s to 1980s were mostly assuaged. Declining prices of staples—particularly irrigated rice, helped by improved nonwater inputs, markets, and trade—increased the food access of the poor. In most developing countries agricultural production has, therefore, met performance expectations.

Dramatic growth of urban populations in developing countries poses severe economic, political, and social challenges that have displaced the attention given earlier to rural development. The rural population is anticipated to decline slightly from 3.3 billion in 2003 to 3.2 billion in 2030. Forty-eight percent of the world's population lived in urban areas in 2003, and this is projected to rise to 61 percent by 2030. With competition for both water and scarce financial resources, political preference has been given to the provision of basic water

supply, sanitation, and environmental needs because agriculture is regarded as primarily a private sector activity. Disillusionment among governments and policy makers about poor performance and maintenance problems of public sector irrigation also quelled interest in the subsector. Much of this was because the expansion of irrigation infrastructure outpaced public management capacity and local institutions. Therefore, diminished attention to agriculture among the Bank's borrowers was consistent with increased attention to social issues, urbanization, and growth.

### **Realignment in Lending**

Lending was realigned with the Bank's strategy for poverty reduction for two reasons. First, Bank policy changes increased the share of lending allocated to the social sectors. Second, agriculture was not on the fastest growth path. Following its 1990 *World Development Report on Poverty*, the Bank adopted a two-pronged strategy that targeted efficient, labor-intensive growth and greater attention to social concerns, including education and health care, a strategy later reemphasized in the 2000/2001 *World Development Report: Attacking Poverty*. With the renewed focus on poverty, lending to the social sectors increased while lending for infrastructure, agriculture, and the environment fell after 1993. IDA replenishment agreements (IDA10–12) also required increases in the share of investment lending in the social sectors, and the HIPC initiative required beneficiary countries to allocate funds released from debt service to public expenditures on the social sectors. As social sector investment increased, lending for infrastructure declined.

Underpinning the focus on poverty was growing evidence that accelerating economic growth was the fastest way to raise people out of poverty. Yet, though most of the poor live in rural areas, development of agriculture has not been the path to the most rapid economic growth. This fact, coupled with serious concern about the environmental and social impact of several large-scale projects—particularly those for water—caused the Bank to reduce its support for public

investments in civil engineering works. Even so, Bank lending for agricultural water management was primarily to the poorest countries. As the volume of lending sharply contracted in the period after 1999, an increasingly larger portion went to the lower-income group and this reached more than 95 percent in 2002 (though investments in Africa also declined).

A new set of smaller clients also emerged as commitments for agricultural water management to the biggest borrowers declined. Before 1999, ECA accounted for only 11 percent of projects in the portfolio; afterward, with 29 loans, it accounted for a third. The Bank's smaller interventions in ECA not only assisted poverty alleviation in the medium term but also provided an entry point for policy discussions aimed at rationalizing the region's aging and oversized infrastructure, which was frequently environmentally damaging and uneconomic to operate.

### **Budget Constraints Squeezed AWM**

Budget constraints within the Bank and new initiatives squeezed out AWM projects. The 1997 *Strategic Compact: Renewing the Bank's Effectiveness to Fight Poverty* significantly reduced budgets for project preparation, a trend accelerated by a substantial shift toward development policy lending during the mid- to late 1990s. At the same time, the skills mix of Bank staff was realigned with the *Compact*, by a loss of technical staff and replacement with staff having more fungible skills. Enhanced fiduciary and safeguard provisions increased the costs of project preparation such that AWM projects are among the most expensive to prepare. Squeezed by budget pressures, high costs, muted advocacy, and new development initiatives, country directors' interest in AWM waned. Since 2002, budgets and staffing have modestly improved and, refocused by the new rural and water sector strategies, lending for rural development and AWM has shown a resurgence. The main lesson is that vital investment in rural areas and AWM will not take place unless directors' incentive structures are reformed and budgets that are commensurate with the

challenge are provided to enable staff to be effective.

### **Changes in Development Objectives for AWM**

Evaluation of the country assistance strategies and projects approved during the period 1994–2004 shows a change toward a more integrated approach to rural development, with a growing emphasis on building social capital. Project objectives encompassing community support and participation, income and employment, and support for capacity building and institutional development increased. Conversely, objectives that are central to the new policies—addressing poverty reduction, agricultural development and production, and environment and natural resources management—declined in importance. One reason for these changes is that development objectives have become more practical and achievable by focusing on measurable outcomes rather than global targets. For example, increased attention to income and employment almost balances the decrease in poverty-reduction objectives.

Attention to the technical and social issues of agricultural water management has become more polarized. This may not be an issue where agricultural water management projects are part of a broader package of rural development endeavors that deal with social, human, and economic development. But the more general projects, in which water-related activities are in the minority, are building water infrastructure with less attention to issues of technical efficiency and sustainability. These findings indicate the importance of integrating agricultural water management projects within country rural strategies and ensuring that they are adequately supported either by parallel operations that address critical omissions, or by improving the skills mix of appraisal teams preparing agricultural water management components of nonwater projects.

### **Low-Cost Approaches Are Increasingly Important**

The average Bank commitment to agricultural water management projects declined for two

reasons: a change in the type of infrastructure financed and the greater emphasis on nonstructural and capacity-building components. Freestanding projects dedicated to water management now comprise only about 40 percent of the agricultural water management portfolio. There is a marked difference in the type of infrastructure components financed by dedicated and nondedicated projects, even though most contain a mix of physical interventions ranging from some new-builds, redesign and upgrading, and repair of damage caused by deferred maintenance, referred to as rehabilitation. Among the dedicated projects, rehabilitation or improvement of large irrigation systems now account for more than 80 percent of Bank commitments. Nondedicated projects, with an initial focus on rehabilitation in the mid-1990s, now build new systems that are small scaled, community owned, and integrated in social development programs. Because rehabilitated projects averaged \$2,900 per hectare, while new construction averaged \$6,600 per hectare, there was a substantial fall in the cost of projects. As a result, the average loan amount per project fell from \$59 million in 1994 to a low of \$15 million in 2001.

### **AWM Remains Relevant**

Demand for increased global agricultural production will require better management of increasingly scarce water resources. As the world's population grows from its present 6.5 billion to 8.2 billion in 2030, the FAO projects that a new round of investment in irrigation and drainage will follow, albeit at half the average rate of the preceding four decades. The balance of new arable land will come from developing countries that have the potential to add about 120 million hectares of new arable land. The expansion will be strongest in South Asia, East Asia, the Middle East, and North Africa regions where almost all arable land potential is utilized. Harvested irrigated area, subject to multiple cropping, is likely to increase by a third, or 83 million hectares by 2030.

Better regulation and management will be required because of more competition for water

and degradation of supplies owing to pollution and reduced investments for infrastructure maintenance. Globally, water is becoming an increasingly scarce commodity—more than a quarter of the developing world population will face severe water scarcity in the next 25 years. And groundwater, the mainstay of most private sector investment in South and East Asia, the Middle East, and North Africa regions, already is being extensively overexploited and mined. The net effect will be increasing real costs of water at the farm level and declining social profitability of irrigated agriculture.

Irrigation boosts growth and reduces poverty directly and indirectly, benefiting the poor in several ways. Poor farmers directly benefit from increases in their production, which may increase their own consumption and provide a surplus of marketed products for increased farm income. Small farmers and landless laborers benefit from agricultural employment opportunities and higher wages, and a wide range of rural and urban poor benefit from related growth in the rural and urban nonfarm economy. Crop harvest from irrigated areas leads to strengthened staple or nonstaple food output, which lowers prices and benefits all consumers, particularly the poor.

Agricultural growth generates important income and employment multipliers within the surrounding nonfarm economy. The multipliers are particularly large in Asia, between 1.5 and 2.0 of the incremental agricultural benefits generated, but they are only half as large in Africa and Latin America. Multipliers are higher in labor-abundant regions, and increase with regional development and per capita incomes. Specifically, irrigated regions dominated by medium-sized farms and modern input-intensive farming systems generate the largest multipliers. Multipliers are smaller in rain-fed farming systems and in regions dominated by very small farms or large estates. This poses a dilemma for decision makers: a poverty-targeted intervention aimed at small farmers may not be the most efficient way of increasing agriculture's contribution to economic growth.

Even so, it is the “package” that matters for effective poverty alleviation and not just the supply of irrigation water. Investments in agricultural water management may not reduce poverty directly in any significant way unless accompanied by other complementary interventions.

### **Increasing Relevance and Performance**

The relevance of agricultural water management operations to borrowers and to Bank country directors can be increased through better analysis of links to economic growth, more attention to demonstrating social impact and poverty reduction, and better management. While most CASs discussed the importance of agriculture policy, less than half discussed it in the context of economic growth; greater prominence was given to community-driven development, general rural development, and reform of agricultural institutions.

#### ***Demonstrate Growth Impact***

This is particularly important as the economic efficiency of all rural sector projects is less than most other sectors in the Bank, and is declining—it is ninth among the 13 sectors reporting measures of economic efficiency. Investment in agricultural water management is economically efficient but is becoming less competitive. The annual average economic rate of return for completed agricultural water projects steadily declined from 25 percent in FY00 to 17 percent in FY06. The primary reasons for this are diseconomies of scale, as average projects became smaller in area, global commodity prices declined, and benefits were smaller and delayed.

#### ***Measure Social and Financial Impact***

Reports on how many people benefit, their social status, and how they benefit are not very common despite a substantial increase in the use of social assessment. Slightly less than one-half of the projects report how many farmers benefit but less than a fifth report how many people benefit or the social distribution of benefits. While the number of projects reporting farmer numbers increased between

appraisal and completion, reports on outcomes for particular social groups and people (particularly women) declined. While farmer numbers are associated with the use of project inputs (training, credit, extension services, and cooperative or water user group formation), very few social groups or individuals can be directly linked with such easily measured project inputs. The falloff in information on social impact is primarily because the results chains linking inputs to critical outcome indicators is frequently missing, a problem exacerbated by poor M&E.

### ***Improve Monitoring and Evaluation***

Current M&E does not provide adequate information to inform Bank management of progress toward strategic objectives—particularly poverty alleviation and the Millennium Development Goals—and needs an overhaul. Overall quality of M&E design improved in the late 1990s with the introduction of logical frameworks and their mandatory use in PADs. Even so, the quality of the M&E systems declined as evaluation has increasingly focused on outcomes and impacts. Only a third of completed projects had a baseline before the project started and less than half attempted to establish a baseline during the project. Slightly more than 20 percent never established a baseline. And only 9 percent of projects that calculated ERRs created “without-project” controls. This raises questions about the robustness of the conclusions drawn by most projects that assert improvements in observed production and farmers’ incomes and that attribute it to the Bank’s project-level interventions. Even when there was good M&E design, inadequate supervision—possibly because of the widespread practice of delegating supervision to country staff—sometimes reduced effective implementation of M&E. More training of all staff is indicated. Current ICR guidelines would benefit from a mandatory section on who the beneficiaries are and how they benefit. Much greater attention is needed to establish indicators and evaluative frameworks to unambiguously determine and attribute the development impacts of Bank lending.

### ***Increase Focus on Policy and Institutional Reform***

PADs make only modest proposals for policy reform and completion reports usually conclude that reform expectations at appraisal were unrealistic, particularly for cost recovery. Dedicated irrigation and drainage projects with policy content—large or small—only give it modest attention. Many appraisal documents implicitly assume either that policy reform is largely complete, or that it is beyond the project’s scope—particularly where irrigation and drainage was only one of many components, or where the size of the investment was small. Yet, in many cases, important policy issues remain to be tackled. Therefore, the Bank frequently scaled back lending for irrigation before the policy reforms needed to get the balance right between public and private intervention were completed; examples are Morocco, Nepal, and the Philippines. Yet there have been notable successes, particularly in the ECA Region and Egypt.

### ***Build Support for Water User Groups***

There is considerable disillusionment with the performance of water user groups or associations and a widespread view that, for some years, the Bank has had unrealistic expectations for them. While the principle of user participation is still widely supported, farmers often lack the skills needed to manage the larger irrigation systems and the need for continuing government support has been underestimated. Projects have tended to give more emphasis to strengthening WUAs than to strengthening the broader authorization and institutional framework in which they must function. They also did not contain a plan for the gradual phasing out of support as the user groups mature.

### ***Move Beyond Simple Cost Recovery***

Expectations about cost recovery following handover to user groups are frequently unrealistic and too ambitious. Most appraisal documents simply outline a strategy to fix water delivery infrastructure, to raise cost recovery, and to increase participation through handover. Few

offer a clearly articulated methodology for improving water use efficiency, whether it be through some form of volumetric pricing, an area/crop-based approach, or lower-cost proxy, or a restricted-supply approach, such as the South Asia *warabundi* system, and too few link this to the redesign of water supply systems. Simultaneous attention to community operation, management, and physical modernization of water distribution networks is not very common, reducing the efficacy of both interventions. Where this is done, the results can be outstanding, as shown in China's Tarim Basin and in Armenia. Where the potential synergy is not captured, the outcomes have been disappointing.

#### ***Embed AWM in Sectorwide Approaches***

The complementarity among irrigation investments and extension, marketing, and credit services can be improved, particularly for dedicated projects. While there was a big increase in the share of irrigation projects that addressed credit and marketing constraints after

1998—most of this increase derives from nondedicated projects.

#### ***Correct Staff Mix Is Important***

Markedly different strengths and weakness between dedicated and nondedicated water projects are related to the skills base of task managers. Nondedicated projects scored highly on social and institutional factors but poorly on attention to the quality and sustainability of their (minor) water-engineering components. Conversely, dedicated projects were good on the engineering but tended to neglect institutional issues, social concerns, and incentives for farmers and organizations to improve their efficiency. In the past, these omissions were taken care of by parallel operations—but with the shrinkage of rural sector lending this is a problem. Sector managers expressed no strong views about training and most had no training plans, following Bank policy that it was up to staff to take the initiative—perhaps it is time to introduce training plans to mitigate revealed weaknesses.