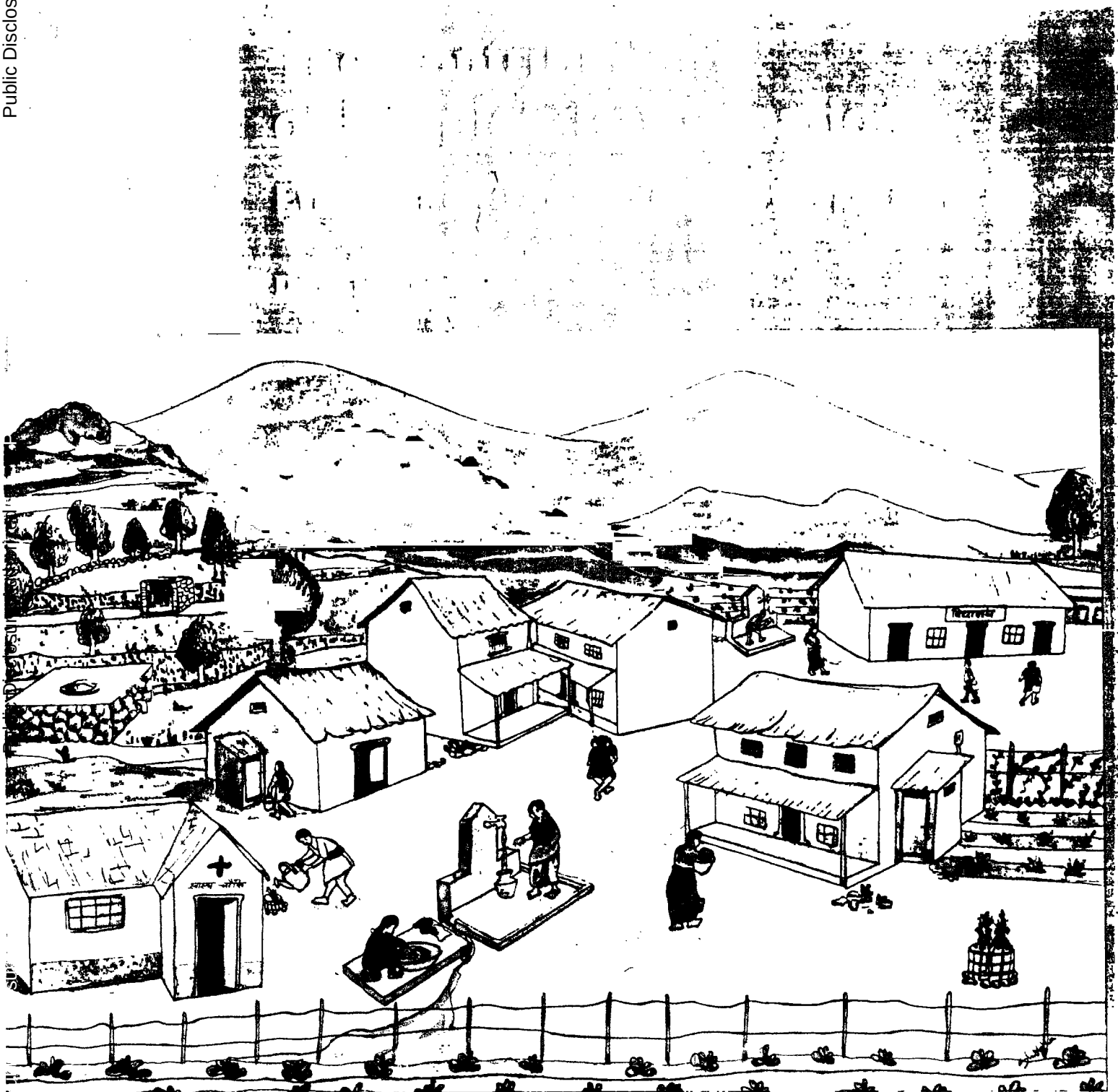

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The Contribution of People's Participation

Evidence from 121 Rural Water Supply Projects

Deepa Narayan

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This report has been prepared by the staff of the World Bank. The judgments expressed do not necessarily reflect the views of the Board of Executive Directors or the governments they represent.

The drawing on the cover was prepared to generate discussion around local water problems. Such drawings are used to focus members of a community on what their water problems are and to mobilize them to work together toward solutions. The cover design is by May Eidi.

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Foreword

This report is the first of a new series of Occasional Papers to be issued by the Office of the Vice President for Environmentally Sustainable Development. Since the essence of sustainable development is helping people make their own decisions and take responsibility for their own welfare, I am pleased to launch this series with a report highlighting the importance of local participation and social organization in the success of rural water supply programs. This work clearly establishes the need to invest in social infrastructure if physical infrastructure is to be used effectively.

The study is based on systematic quantitative and qualitative analysis of 121 rural water supply projects funded by many different agencies in countries throughout the developing world. The analysis consistently shows that beneficiary participation was more significant than any other factor in achieving functioning water systems and in building local capacity. The degree of participation depended on local demand and organization, and particularly important were agency autonomy and the degree to which agencies accepted and monitored the goal of achieving local participation. The most common agency problem was reluctance to give up control or to invest in developing the capacity of local organizations.

The results of this study have profound implications for the way the World Bank supports its partners in planning and implementing development programs. Among the lessons gleaned from the study are these: obtaining local participation in decisionmaking about development is sound business practice, and special measures are needed to ensure that the marginalized are reached in the participatory process. Participation can happen only in the right policy environment, in which user demand is primary. Even when participation is assured in planning, agencies must listen and learn as projects are implemented.

These principles are clear, and their implications reach well beyond rural water supply projects. The challenge is to act on these principles and to place people at the center of development.

Ismail Serageldin
Vice President
Environmentally Sustainable Development
The World Bank

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This study began in 1991 as part of the contribution of the United Nations Development Programme (UNDP)-World Bank Water and Sanitation Program to the Bank-wide Participatory Development Learning Group. The study is a collaborative effort between the United Nations Development Programme-World Bank Water and Sanitation Program, and the Social Policy and Resettlement Division of the Environment Department of the World Bank. It was financed by the Governments of Sweden and Norway.

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- *Phase III—Model building and model testing:* Lant Pritchett, with research assistance from Jon Isham, guided the testing process for the model, using multivariate regression analysis. Lant Pritchett also helped organize the statistical evidence in chapters 4 and 5. Ellen Tynan helped develop the matrix included in appendix 2 and provided assistance with analysis of the qualitative aspects of the study.

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Executive Summary

Field observations have led many people to believe that beneficiary participation in decisionmaking can contribute greatly to the success of development projects. When people influence or control the decisions that affect them, they have a greater stake in the outcome and will work harder to ensure success. But the evidence supporting this reasoning is qualitative—some would say anecdotal—so that many practitioners remain skeptical. Even when they accept that participation is important, the qualitative approach does not offer much guidance on how to promote participation in large-scale programs. Therefore three questions need to be addressed systematically: To what degree does participation contribute to project effectiveness? Which beneficiary and agency characteristics foster the process? And, if participation does benefit project outcomes, how can it be encouraged through policy and project design?

To answer these questions, researchers studied evaluations of 121 completed rural water supply projects in forty-nine developing countries around the world. Eighteen different agencies supported the projects, which employed a variety of technical approaches. The results are clear: beneficiary participation contributed significantly to project effectiveness, even after statistically controlling for the effects of seventeen other factors.

The results are based on quantitative and systematic qualitative analyses of data across projects and within the lifetime of individual projects, sometimes over a decade or more. The quantitative data came from content analyses done by two independent coders for each report, covering 149 variables. Intercoder reliability was high on key variables, and testing for so-called halo effects produced no significant change in the results. Preliminary correlation analyses and factor analyses to reduce the number of variables led to a model that applied the framework of collective action to management of rural water as a common property resource. To move beyond correlations among indicators toward causality, multivariate regression analysis was used to test the collective-action framework. Additionally, the twenty projects that were scored as most effective were analyzed to determine their key design features.

How Much Does Participation Contribute to Project Effectiveness?

Results obtained from quantifying levels of participation establish that participation contributed significantly to overall project effectiveness, even after controlling for eighteen direct and indirect determinants of outcomes. The proportion of water systems in good condition, overall economic benefits, percentages of the target population reached, and environmental benefits rose significantly with participation. Participation

also helped assure equality of access to facilities, although its effects were less pronounced in this outcome than in the others already cited.

Not surprisingly, the analysis reveals that participation fostered individual and community empowerment. It also promoted new water-management and organizational skills in the community. Finally, it strengthened local organizations, which then went on to undertake other development activities.

One shortfall of the participation process deserves mention here. Although most projects identified women as a target group, only 17 percent of the projects achieved high levels of involvement by women. High levels of beneficiary participation did not necessarily mean that women's participation was high. Women in most rural areas face many constraints to participating in development projects, and unless their involvement was specifically targeted and resources to ensure it were invested, it did not occur.

Participation at Different Stages

The study examined how final outcomes were affected by the quality of outcomes at each of the stages of a project cycle, namely, design, implementation, construction, and maintenance. A series of multivariate regression analyses produced two major findings:

- Participation was the single most important determinant of overall quality of implementation.
- The impact of participation throughout the project cycle was significantly greater than it was during any single stage.

In-Depth Qualitative Analysis

Statistics tell only part of the story. Individual projects had to be analyzed in depth to better understand how participation worked in practice and to evaluate uncoded agency factors. Four findings are worth highlighting:

- The forms of effective participation varied tremendously, ranging from representational committees of users to domination by leaders and elites, and from direct involvement in construction to supervision of contractors.
- Effective participation did not result when agencies retained control over implementation details—that is, the what, when, how, and where of implementation.
- Nongovernmental organizations (NGOs) figured in half of the success sample (that is, ten of the twenty most effective projects), although they represented only 15 percent of the total sample.
- Issues concerning physical infrastructure and technology have been addressed more effectively than ones concerning the social organization necessary for managing the physical works.

Which Beneficiary and Agency Characteristics Foster Participation?

Participatory processes are nonlinear and iterative. The process interacts with intermediate outcomes, which influence the process, and so on. It is nevertheless possible to identify the critical elements of the participation process, as well as the determinants of the eventual participation levels of beneficiaries. These relationships were analyzed through multivariate regression analysis, which showed that the three intermediate elements most highly correlated with overall levels of beneficiary participation were:

- User investment in capital costs
- Local ownership and control
- Agency responsiveness to feedback.

Therefore participation is determined by characteristics both of the beneficiaries and of the agency and project.

At the beneficiary level, the two key characteristics determining participation were commitment before construction, or *demand,* and the *degree of organization of the beneficiaries.* When beneficiaries made a commitment before the project was implemented, they became involved in project activities, including investment in capital and recurrent costs. Projects flourished when the service provided matched what consumers wanted and were willing to pay for. Forms of organization—the other beneficiary characteristic important for participation—varied even within communities, but common to all forms were internalized, self-enforced rules and regulations that governed criteria for membership and access to (or exclusion from) the facility.

For agencies, the two most significant characteristics were *relative autonomy* and *degree of client*

orientation. Three client-orientation strategies emerged as essential for effective participation:

- Making beneficiary participation a goal to be monitored and evaluated, and rewarding staff for achieving it
- Using local knowledge for designing and implementing projects
- Investing in building the capacity of local people, including providing information to help people make informed choices and allowing time for communities to organize themselves.

The qualitative analysis revealed also the three most common hindrances to participation, caused by even some well-meaning agencies that tried to elicit participation:

- Unwillingness to give up control over implementation details
- A lack of incentives for staff to support client orientation through new institutional arrangements
- A unwillingness to invest resources for building the community capacity or social organization to manage the physical infrastructure.

How Can Participation Be Encouraged through Policy and Project Design?

Sector policies, project design, and implementation strategies must change fundamentally in rural water supply programs. They must encompass a shift from centralized ownership of systems to local ownership and control. Approaches must change as well: instead of being supply-oriented, they must become demand-responsive and participatory. Achieving these shifts will require changes at the sectoral policy level and the community level.

Research for this study found several steps in the design of large-scale projects to be essential for effective outcomes: objectives must be clear and specific; financing mechanisms must be responsive to demand; a community self-selection process must be used to undertake water-improvement projects; the planning process must focus on learning and applying lessons in implementation; intermediary organizations that work to support communities must be clearly identified; and substantial investments in strengthening the capacity of community-based organizations must be made.

Several rural water projects financed by the World Bank are now moving forward; they are based on the principle of local participation, control, and authority, and supported by an approach to project design that emphasizes learning over blueprints. It is too early to draw conclusions about performance, but two facts are already evident. First, although large-scale projects can be designed with a built-in commitment to demand-responsive approaches and active "experimentation," there is no standard model for doing so. Second, in the absence of a standard model—that is, where learning relies on flexibility, adaptation, and necessarily short planning horizons—monitoring and evaluating are even more important for success than they are in traditional projects.

CHAPTER 1

Introduction

People's participation in decisionmaking and local ownership results in effective and sustainable rural water systems. This belief has played a central part in the shift in institutional strategies from supply-driven to demand-driven approaches, which respond to the felt needs and aspirations of users, especially the poor. However, quantitative evidence of the efficacy of participation in determining project effectiveness, relative to other factors, has been missing. The present study is a step toward filling this gap. It is based on multivariate analyses of data derived from evaluation reports of 121 rural water supply projects implemented by different agencies around the world. Project reports were supplemented by in-depth anthropological and sociological studies and by other project reports received after data analyses had been completed.

In most developing countries, public sector agencies provide rural infrastructure. Poor public sector performance has led to a widespread search for institutional alternatives and means to increase the accountability of the public sector. In the rural water subsector, the search has been for strategies to increase users' "exit" and "voice" options and to restructure the sector so that suppliers have incentives to match the demand of users.

The problematic issue therefore is not technology and construction but rules and regulations—institutions—and organization. The first challenge for agencies is to create an incentive for staff to work in partnership with hundreds of communities. The second task for agency staff is to enable communities to make informed choices, organize themselves, initiate collective action, and manage and choose from a menu of water supply options (technology and management) that the agency offers.

Although the agency task has changed dramatically over the years, that fact has seldom been recognized or acknowledged by the agencies themselves. Hence, the agencies and their competency, organization, structure, and management-by-blueprint style have remained largely the same. The mismatch between the task and the mandate, ability, and competence of the agency has resulted in many unsuccessful government attempts to induce participation. The key question, then, is: How can organizations change to induce participation in collective action?

This study examines efforts to induce participation as a means to create effective rural water systems and to build the local capacity to manage them. Beneficiary participation can be brought about in several ways: directly, through participation in decisionmaking; indirectly, through leaders; or through representation on committees or boards. Participation of beneficiaries can be facilitated through extension workers, local govern-

ment units, nongovernmental organizations (NGOs), and the private sector. Many factors influence beneficiary participation, including the immediate and broader policy context; client characteristics (including felt need); and agency characteristics, such as flexibility, responsiveness to clients, and willingness to invest in the sound organization of communities.[1] This study specifically addresses the following questions:

- Does people's participation contribute to project effectiveness?
- How important is this contribution, relative to other factors?
- What factors and strategies influence participation in collective action?
- What are the lessons for the design of large-scale water projects?
- What are the implications for policy reform?

Chapter 2 focuses on the conceptual framework and defines terminology, including participation; it also outlines the model used in the study. Chapter 3 reports on the research methodology, describes the coding process and methodological limitations, and lists the variables included in the study. Chapter 4 addresses the contribution of participation to project outcomes, using multivariate analyses. It examines the contribution of participation to project outcomes and studies the robustness of the relationship by controlling for other determinants of project success.

After establishing the importance of beneficiary participation, chapter 5 examines the determinants of participation itself, both project characteristics and beneficiary characteristics, and describes intermediate steps toward participation. Chapter 6 discusses the implications of the findings for the design of future World Bank projects and presents examples of some strategies now being used in recently designed projects. Chapter 7 highlights conclusions and policy recommendations. The appendixes include a matrix of findings from analysis of the twenty projects in the study that received the highest ratings for overall effectiveness.

CHAPTER 2

The Concept of Participation

Participation means different things to different people. This chapter clarifies the *what, why, who,* and *how* questions of participation and collective action and outlines the conceptual model used to guide the study.

What Is Participation?

Definitions of participation abound (Cohen and Uphoff 1977; Korten 1980; Paul 1987; and Ghai and Hewit de Alacantara 1990). All of them include in some measure the notions of contributing, influencing, sharing, or redistributing power and of control, resources, benefits, knowledge, and skills to be gained through beneficiary involvement in decisionmaking. There is also much debate among practitioners and in the literature about whether participation is a means or an end, or both (World Bank 1992; Picciotto 1992). For the purposes of this study, participation is defined as a voluntary process by which people, including the disadvantaged (in income, gender, ethnicity, or education), influence or control the decisions that affect them. The essence of participation is exercising voice and choice.

This conception does not assume that there is an ideal level of participation to be achieved. The most effective form of participation varies, but over the long run sustainability will depend on minimizing transaction costs in horizontal and vertical interactions. Participation is viewed as a means to defined ends, not as an end in itself; the goal therefore is to optimize participation to achieve the desired project goals, not simply to maximize participation. The desired goals in rural water supply projects include achieving improved water supply systems and developing the human, organizational, and management capacity to solve problems as they arise in order to sustain the improvements.

The principle underlying participation—to give people a voice—is constant, yet the choices that people make vary infinitely. Thus, a community may decide to subcontract maintenance to an independent mechanic rather than to undergo training and take turns doing the work. A water users' group may choose to dissolve the organization or to define new goals after the first ones have been met. For example, when construction is complete, a water committee may transform itself to undertake sanitation construction, to build a football field, or to branch into children's education, depending on the commonality of interests. A large community group may divide into smaller, functional subgroups, with the larger group meeting only occasionally. Alternatively, people may informally nominate leaders to represent their interests.

Levels of Participation

Participation is a multidimensional, dynamic process, which takes varying forms and changes

during the project cycle and over time, based on interest and need. Samuel Paul (1987) usefully distinguishes among levels of participation, all four of which may coexist in a project. The first two categories present ways to exercise influence; the other two offer ways to exercise control. The levels comprise information sharing, consultation, decisionmaking, and initiating action.

Information Sharing

Project designers and managers may share information with clients to facilitate collective or individual action. The information flow is one-way, from agencies to communities. Although it reflects a low level of intensity, information sharing can positively affect project outcomes by enlarging clients' understanding of specific issues (for example, by explaining hygienic practices or how groundwater is polluted). Information sharing may also be one-way in the other direction, in the form of baseline or feasibility studies wherein information (but not necessarily opinion) is gathered from beneficiaries. Many such studies tap local knowledge but do not consult the local clients.

Consultation

When project designers and managers not only inform clients but also seek their opinions on key issues, a two-way flow of information develops. This two-way flow presents some opportunities for clients to give feedback to project designers or managers, who can then use the information about preferences, desires, and tastes to develop designs and policies that achieve a better fit between agency programs and community demand. Examples of consultation include methods that tap indigenous knowledge and organizational forms, such as socioeconomic surveys, beneficiary assessments, and willingness-to-pay studies.

Decisionmaking

Information sharing and consultation generally do not lead to increased local capacity or empowerment of local people and institutions, although they can lead to more effective programs. Client involvement in decisionmaking, however, either exclusively or jointly with the external agency, is a much more intense level of participation which often promotes capacity building. Decisionmaking may be about policy objectives, project design, implementation, or maintenance, and different actors may be involved at different stages of the project. thus, the decision to participate in a project may be made by the community, and the choice of technology may be made jointly, after the costs and benefits of the various technological options have been explained by the agency and understood by the community.

Initiating Action

Initiating action, within parameters defined by agencies, represents a high level of participation that surpasses involvement in the decisionmaking process. Self-initiated actions are a clear sign of empowerment. Once clients are empowered, they are more likely to be proactive, to take initiative, and to display confidence for undertaking other actions to solve problems beyond those defined by the project. This level of participation is qualitatively different from that achieved when clients merely carry out assigned tasks.

Institutional options for rural water supply depend on whether water is treated as a public, private, or common property good, and on the resultant degrees of excludability (the degree to which other users can be excluded) and jointness or subtractability (the degree to which use by one affects the overall production cost of use by someone else). Similarly, the most appropriate level of participation depends on who owns the water and on who manages the extraction and distribution of water. The degree to which water can be managed collectively depends on the ability to exclude some, but not others. The degree of jointness adds complexity to and determines the participants in the negotiations. (For example, in the development of a system for piped water, users at the top and at the bottom of the distribution ladder need to be involved in negotiating rules and regulations for the distribution of the water.) Moreover, the moment external agencies intervene to improve the quantity and quality of water, or to make water more accessible, issues related to rural infrastructure and technology choice come into play and add another layer of complexity to issues of decisionmaking and participation.

Despite continued government investment, the state of infrastructure has deteriorated, especially in developing countries (Israel 1992). This decline has led to a renewed attempt to focus on the reliability and maintenance of infrastructure. To help identify the role that participation plays in infrastructure effectiveness, it is useful to look at the decisionmaking phases and tasks involved in the construction of rural infrastructure.

Rural infrastructure is developed in four broad phases:

- Design or planning
- Construction
- Operation
- Maintenance.

In practice, work overlaps and shuttles back and forth among those tasks. For the purpose of undertaking a rural water supply project, the categories of issues confronting the rural infrastructure concern:

- Decisions to join, ownership issues, and conditionality
- Choices of technology and service levels
- Costs and financing
- Decisions about design and construction
- Tariff management
- Water allocation
- Operation and maintenance
- System expansion and replacement.

These categories clearly suggest that clients and agency personnel can be involved to varying degrees in influencing or determining the many different choices to be made in any given project. The tendency in the past was for agencies to dominate over community or client choice, sometimes with disastrous results.

Why Participate?

Participation engenders financial, social, and psychological costs as well as benefits. Clients or beneficiaries are likely to participate when their benefits outweigh their costs, just as agencies are likely to foster beneficiary participation when the benefits of doing so outstrip the costs to the agency. However, knowledge about the costs and benefits of participation remains limited; little guidance about budget allocations appropriate to induce participation is available to those planning large-scale projects. Nevertheless, from an agency perspective people's participation (as an input or an independent variable) can contribute to the achievement of four main objectives: *effectiveness; efficiency; empowerment;* and *equity.*

Project Effectiveness

Project effectiveness is the degree to which stated project objectives are achieved. Client involvement, direct or indirect, may result in a better match between what users want and what an agency or project offers. Rural water supply projects are considered effective if they increase access to and reliability of water sources, so that people have water in the quantity and quality and with the reliability and convenience they demand. Effective water projects produce health-related, economic (time savings), and environmental benefits, among others (Narayan 1989; Jaganathan 1992).

Users can facilitate effective water projects in several ways at different stages. They may contribute to redefinition of objectives, better project design, redesign, site selection, resource mobilization, construction, implementation, and maintenance of facilities beyond the life of the project. Beneficiary ownership and control of the project also are often seen as essential elements in establishing effective projects.

Project Efficiency

Project efficiency measures the relationship between a given output and its cost and inputs. Because anticipatory decisionmaking allows more timely beneficiary inputs, as well as synchronization of agency and client inputs, it may well lead to greater efficiency. Discussion, consultation, and information sharing often produce greater consensus about goals and means and more clarity about roles, authority, and ownership than would otherwise be possible. Consensus and clarity in turn reduce conflict and delays, resulting in smoother implementation and lower overall costs. For example, proper identification of land and water ownership rights and timely acquisition of land permit quick construction and completion of piped-water systems. Community management or private sector involvement in fee collection may entail high transaction costs, yet either of those options may be much more efficient than fee collection by a public agency.

Empowerment

Empowerment is essentially a political concept that means more equitable sharing (or, redistribution) of power and resources with those who previously lacked power. Any activity that leads to increased access and control over resources and to acquisition of new skills and confidence, so that people are enabled to initiate action on their own behalf and acquire leadership, is an empowering activity. The central argument for participatory processes is that involvement in decisionmaking lets people exercise choice and voice more broadly in their lives, as well as in the more immediate context of development programs that benefit them. Empowerment is thus, about the capacity building of individuals and the organizations that support them.

Equity

A major purpose of development assistance is a more equitable distribution of the benefits of development. It is well established that development gains tend to be "captured" by those already better off. Despite the gains made during the International Drinking Water Supply and Sanitation Decade, over a billion people are still without access to safe water. The primary goal of rural water supply projects is to reach those people. When included in the pursuit of this broad goal, beneficiary participation—which promotes transparency and accountability—may lead to less capture by the elites and to more equitable access to improved water supply, thus, helping serve the purpose of development assistance in general.

Who Participates?

Participation occurs at global, national, subnational, community, and household levels. The primary focus of this study is on the participation of beneficiaries, those who are meant to benefit from the change brought about by rural water supply development projects. hence, the characteristics of these users (individuals and groups) are important because they influence the type of participation that occurs.

The most important characteristic that brings people together to take action is commonality of interest. This is the glue that binds people who may otherwise not have much in common in terms of geography, wealth, power, leadership, degree of organization, social cohesion, ethnicity, income, gender, or education. Commonality of interest may supersede other distinctions, including the entity of "community" (or village or other administrative label of convenience). thus, when water service is not differentiated, and alternative sources are practically nonexistent (as in arid zones), the rich or elite are as much affected as the poor by lack of water. Although men may be interested in an improved water supply for cattle and women may want the water for domestic uses, their common need for water can bring them to work together to negotiate change with service providers.

Some important client characteristics that influence participation are *gender* (women, as the primary managers of domestic water, are more affected by, and therefore more interested in, improved water supplies); *income* (the poor have less ability to pay for water, but their need is greater because they often live the farthest from water sources); *education* (the assumption is that the more educated the group of people, the more easily they understand the issues and the more willing they are to take action); *knowledge and skills* (when people have some understanding of water issues, technology, and financial management skills, they can more easily manage improved systems); and *social cohesion and organization* (trust, loyalty, and reciprocity are important in undertaking collective action, achieving consensus about objectives and rules, and in effectively managing conflict).

Also consistently cited as important in effecting participation are leadership qualities and the presence of leaders. The presence of local leaders is important to initiating change, and leadership qualities among users are important in bringing about and sustaining change on a large scale.

How Do People Participate?

Evidence shows that outside agencies and organizers can induce collective action when an issue deals with a common interest of community groups. This process of organizing the poor so that their voices are heard is a role that many NGOs have played effectively in addressing a

variety of needs, from employment and water to marketing and housing (examples include the Aga Khan Support Program in Pakistan, BRAC and Grameen Bank in Bangladesh, Amul in India, WALI and Dian Desa in Indonesia, and KWAHO in Kenya). Increasing evidence also shows that many of the roles currently being fulfilled by public sector agencies can be more effectively and efficiently carried out by the private sector. Various aspects of service delivery can be contracted out, for instance, limiting the public sector role to regulating, fostering competition, and monitoring performance (Triche 1990). While it is clear that many NGOs can induce collective action, financial resources (including external assistance) are channeled primarily through government agencies. The central questions, therefore, are these: Can government agencies induce collective action on a large scale? If so, under what conditions, and with what mechanisms? The challenge to government agencies is to restructure their policies, institutions, and organizational forms so that public agencies are accountable for their performance and have the incentive to respond flexibly and quickly to people's demand, either directly or through involvement of the private sector, including NGOs.

Inducing Collective Action

Several factors, which can be divided into three broad categories, affect the success of collective action (Bromley 1986; Oakerson 1986; and Wade 1980). Those categories concern characteristics of the natural resource, of the clients, and of the agency inducing change. The interaction of people and agencies determines outcomes, and the attributes of the natural resource determine the boundaries, which in turn influence the nature of the interaction.

Oakerson (1986) provides an analytically useful framework for understanding the conditions under which collective action works. Physical (that is, natural) and technical attributes, especially those related to degree of jointness, excludability, and differentiation, set the parameters within which groups and agencies must operate. Within these parameters, the most important factors are the rules and decisionmaking arrangements that affect behavioral interactions and service outcomes. Decisionmaking arrangements determine who decides what in relation to whom. Three types of rules govern the success of collective action: the conditions that establish the ability of a group to act collectively to make decisions common to the group, including obstacles or opportunities for individual decisionmaking; operational rules of groups regarding use, including entry and exit rules; and external decisionmaking arrangements that affect the ability of groups to act collectively. These categories comprise bureaucratic rules and those made or enforced by traditional authority, market arrangements, and legislative rules.

The environment created by these rules and decisions influences perceived costs and benefits of users, and thus, either limits or enhances their behavior and choices. Successful collective action or choice of cooperative strategies is dependent on reciprocity, a mutual expectation of positive performance among individuals. Free-rider problems—which occur when one individual does not contribute, assuming that others will—affect collective action. In this environment, the degree to which members monitor one another's behavior, hold one another accountable to certain standards of behavior, and successfully apply sanctions becomes important. If reciprocity is abandoned, patterns of interaction may include deceit, threats, intimidation, and collapse of collective action arrangements.

Over time, as learning takes place, poor outcomes influence the pattern of interaction, which may eventually lead to changes in rules or decisionmaking arrangements. For example, a group of water users in Rwanda who managed their own system changed rules when they discovered that women were spending as much time collecting fees as they had earlier spent collecting water (Yacoob and Walker 1991). Local government in the Kwale district in Kenya instituted a legal transfer of handpump ownership to communities when they found that, despite training, communities expected the government to repair pumps (Narayan-Parker 1988). In Kumasi, Ghana, despite a wait of several years, only 300 households had been connected to a conventional sewerage system meant for 3,000 households; the city utilities finally adopted a different approach—strategic sanitation planning—and offered different service levels (Wright 1993).

CHAPTER 3

Research Methodology and Project Descriptions

The International Drinking Water Supply and Sanitation Decade (IDWSSD) brought investment in hundreds of small and large projects. This study takes advantage of the rich data base available in the evaluation reports of agencies involved in the IDWSSD. It is based on analyses of 121 completed rural water supply projects executed by eighteen different agencies in Asia, Africa, and Latin America; the resulting hypotheses were followed by more specific testing in selected countries. The primary methodological advance of this study is that it uses a large number of case studies and cases, converts them into ratings on a range of variables, and statistically tests a model specifying the relationship of participation to project effectiveness and local capacity building as well as to empowerment.

Carrying out this study required contacting many of the major international support agencies, NGOs, water and sanitation reference centers, and libraries around the world. In addition, regional and country offices of the United Nations Development Programme and the World Bank Water and Sanitation Program collected reports. Out of an initial listing of over 800 references, about 400 reports were received and screened to determine whether they were appropriate subjects for analysis.

Many of the evaluation reports dealt with policies, in-depth studies, and institution-building activities. Projects had to meet two criteria to be included in the study: the focus of the project had to be physical implementation of water supply, and the report needed to have sufficient information to permit analysis.

The evaluation reports were based on three- to five-week impact assessments made by teams of two to five experienced evaluators who had conducted field visits. The teams used a variety of data sources, including extensive interviews and other field visits with staff and beneficiaries, workshops, and reviews of project documentation.

Reports were not screened for participatory activity in the projects, because the quality of in-depth information on participation was uneven (understandably so, since the objectives of the evaluation reports differ from those of the present research). Often the reporting on management and community-level practices was less extensive than the reporting on outputs, inputs, institutional relationships, and external context. The reports were generally sketchy on the costs, details of the organization of the local water system, and role of women. Fortunately, project evaluation reports were supplemented in many cases by anthropological research studies and socioeconomic surveys done within the project context either during the planning stages or in analyses of impact.

Methodology

Within the noneconomic social sciences there has been a long tradition of using qualitative data and

small numbers of in-depth case studies. Sociologists, psychologists, and anthropologists have increasingly turned to quantification of essentially qualitative data obtained through open-ended exploration of issues, however, as a way to subject their hypotheses to statistical tests and to explore the causal relations among variables. One of the key methodological differences between economics and the other social sciences is the process used in arriving at the numbers. Anthropologists, for instance, start with an open-ended process, explore the universe of possibilities, and do not immediately use structured surveys and questionnaires to get at the numbers. Structuring and ordering of variables are inductive and done much later in the process of inquiry than they are in economics.

This study combines model testing, using multivariate analysis of data, with in-depth qualitative analysis of particular cases. The study draws particularly upon and adapts methodologies from two research projects, one by Milton Esman and Norman Uphoff (1984) and the other by Kurt Finsterbusch and Warren Van Wicklin (1987).

A research project supported by USAID (U.S. Agency for International Development) was undertaken in 1975 to clarify the concept of participation; it led to a five-year effort to operationalize the concept and understand its limits, potentials, and applications. Many applied studies grew out of collaborative in-depth work in six countries. The desire for even more quantified, comparative assessments eventually produced some innovative efforts in methodology and a systematic research project on what determined the performance of local membership organizations (Esman and Uphoff 1984).

Realizing the limitations of small samples and purely qualitative assessments, Esman and Uphoff decided to do a large-scale, quantified comparative analysis. They proceeded to identify 150 case studies in the literature that contained enough information to evaluate at least most of fifty-five independent and dependent (performance) variables. Research assistants summarized all of the qualitative and quantitative data from the case studies onto a standard protocol, which was scored for the different variables, using standardized, specified criteria. To test whether this sample was large enough for analytic purposes, the sample was broken into three groups of fifty, each of which was scored. When the subsamples were compared for all variables by nonparametric statistical tests, the authors found statistically significant differences for less than 5 percent of the variables, which is equivalent to meeting a test of significance at the 95 percent confidence level. These results satisfied the researchers that enlarging the sample by another fifty cases would not significantly change the variance of the data being analyzed.

The large sample size allowed study of a multiplicity of variables, the interactions among them, and their effect on local organization performance. Variables fell into five categories: environmental, structural, functional, and participation variables, and exogenous factors.

The major challenge for Esman and Uphoff was to quantify factors and subfactors so that each of them could be rated with a high degree of reliability by trained researchers. Achieving equivalence of meaning across cultures made the task more difficult. After extensive consultations, the project leaders developed a system of coding for fifty-five variables on a 5-point scale. Pearson-product moment correlations were used to test the relationships among variables; regression analysis identified the main factors contributing to the largest variance in performance. The study was also informed by the published literature on participation and primary data collection on that topic in selected countries. Although the sample was not random and the scoring of factors was essentially subjective, the project yielded useful patterns on a subject that had not previously been studied quantitatively. The results of this project were published in 1984 by Esman and Uphoff. *Local Organizations: Intermediaries in Rural Development*, the published results of this project, remains a milestone in the literature on participation.

The study found relatively high correlations between effective task performance and the participatory orientation of the organization. Tasks included planning and goal setting, conflict management, resource mobilization and management, service provision, and claim making. The authors also found that under adverse conditions, local organizations experience less-than-average success *unless* they are highly participatory and have effective leadership.

The methodology outlined above, which attempts to explore statistically the relationship

among variables affecting the performance of local organizations—including participation—was further refined by Kurt Finsterbusch and Warren Van Wicklin (1987). Rather than focus on local organization, Finsterbusch and Van Wicklin analyzed factors affecting project performance; they included participation as one of the variables. An input-output framework guided their analysis. Their model disaggregates input, process, output, impact, and contextual factors.

The study by Finsterbusch and Van Wicklin was based on analyses of evaluation reports for fifty-two USAID projects across sectors. The reports followed a standard format, making it easy to develop and apply a coding system. Construction projects constituted most of the sample, but some health, education, and agricultural research projects were also included.

The study found only moderate, but statistically significant, correlations between participation and project effectiveness. The authors found that effective projects involved good communication from the project authorities to the public; the projects were well received by the beneficiaries, but they were not always participatory.

The main problem with the conclusions of Finsterbusch and Van Wicklin is that their study was based on a relatively small sample and included many different types of projects that do not require beneficiary participation to be successful. The findings therefore may reflect the nature of the projects chosen rather than the importance of participation in its own right.

To follow up on the hypothesis that beneficiary participation is not equally critical in all projects, Finsterbusch and Van Wicklin expanded the sample size to seventy-one projects and did further analyses by type of project. They found that the correlations with participation were much lower for education and health projects (personal communication). The expanded study still covered a range of USAID-funded projects.

Methodology of the Current Study

This study borrows from the methodology described for the two studies cited above, using the conceptual framework developed in Chapter 2; the aim is to test the contribution of participation to the effectiveness and capacity building aspects of rural water supply projects. The main issues of interest were listed and a few questions devised to address each issue. The preliminary questionnaire thus developed consisted of over 200 different items. Based on interviews and feedback from sector specialists, review of the literature, consideration of the information available in reports, and a pilot run on four cases, the questionnaire was eventually reduced to 145 items. Multiple items were used to address one concept. Most of the items were rated on a scale of 0 through 7, with some of the key performance variables scored on a scale of 0 through 10. A code book was developed, which specified the characteristics to be considered in assigning a particular score for each variable.

Two coders (one male and one female) were trained to apply the questionnaire to each project report to produce subjective—but cardinal—ratings until there was a high level of agreement between the coders. The coding of each report took between three and four hours, on average. Initially the two coders met periodically to compare ratings and discuss differences in ratings. These discussions ensured that the two coders were using the same criteria to arrive at ratings and that particular pieces of information had not been overlooked.

Data Limitations

Although every care was taken to avoid ambiguity to and increase coder reliability through training, the ratings were subjective and scores do differ between coders. Since the scores were subjective, coders could agree in general but still assign different numerical values to a particular variable. However, as long as a particular coder was consistent, the difference between coders did not affect correlation analyses. On the other hand, if there are differences in direction of rating between coders, the reliability of the rating of that variable is called into question.

For this reason, two indicators of data reliability were built into the process of data analysis. The first indicator is the intercoder correlation coefficients for the two sets of coded scores. Most of the coefficients were higher than 0.85. The key variables of interest in the study had intercoder coefficients of 0.9 or above (*overall effectiveness*, 0.96; *overall beneficiary participation*, 0.92; *overall community empowerment*, 0.90).

The quality of the reports was uneven, and information for some of the factors was missing. Coders were therefore asked to assign a confidence score for each variable as a second measure of reliability. Each coder indicated his or her level of confidence in the score assigned to each variable on a scale of 1 to 5. Most of these scores, as well as the confidence scores for the key variables, were high.

Subjective ratings are open to the criticism that the "halo effect" colors results. A coder aware of the hypotheses to be tested is more likely to score projects high in participation when the projects are highly effective, and vice versa—in other words, all good things go together. To check for the halo effect, regression analyses were conducted, using the input scores of one coder with the output scores of the other coder. A substantial drop in the correlation coefficients and a change in the results would indicate a significant halo effect in operation. Regressions were repeated, using nonstandardized and standardized data. The findings establish that the halo effect does not significantly alter the results of the coders. (Some findings are reported in Chapter 4. For further information see Isham, Narayan, and Pritchett 1994.)

The rest of this chapter describes in some detail the variables included in the model for the study.

Measuring Variables

As mentioned before, the questionnaire used to code the project reports contained 145 items. Based on the number of observations per item, nature of scale (that is, whether the scale was continuous), intercoder reliability, coder confidence, and analysis of principal components, the number of items included in the model was reduced to fifty. These variables are discussed fully, following a description of some background characteristics of the project, most of which are not included in the model.

Background Characteristics

The 121 projects included in the study were located in 49 different countries. Forty-eight percent of the projects were carried out in Africa, 33 percent in Asia, and 20 percent in Latin America (table 3.1). Most of the projects were completed in the 1980s. Overall, 56 percent of the projects received some bilateral financing; 26 percent got multilateral financing; and 15 percent were financed by national and international NGOs; the remaining 3 percent were completely financed by national governments. Hence, the sample was heavily biased toward externally financed projects.

Three of the 50 items scored—total costs, population reached, and total number of project staff—give some idea of size of projects. The costs of the projects ranged from $500,000 to $250 million; 9 percent of the projects cost more than $25 million; and 17 percent cost less than $1 million.[2] Twenty percent of the projects reached more than 500,000 people; 47 percent, from 60,000 to 500,000; and 33 percent reached fewer than 60,000. Only 76 projects provided data on the number of staff

Table 3.1. Background characteristics of 121 water projects

		Frequency	
Variable	*Category*	*Number*	*Percent*
Region	Africa	58	48
	Asia	39	32
	Latin America	24	20
Year project ended	1972–80	14	12
	1981–85	25	21
	1986–90	72	60
	1991–92	10	7
Main donor	Multilateral donors	32	26
	Bilateral donors	68	56
	NGOs	18	15
	Government-financed	3	3
Cost of project	$0–3 million	39	37
	$3 million–10 million	33	32
	$10+ million	33	31
Population reached	1,000–60,000	38	33
	60,000–500,000	55	47
	500,000+	24	20
Type of technology	Protected springs	2	1
	Dug/shallow wells	8	7
	Tube wells with handpumps	26	21
	Deep-dug wells	25	20
	Gravity systems	41	34
	Power-pumped systems	20	17
Type of distribution system	Spring	2	2
	Well-head handpump	65	53
	Community standpipes	31	25
	Private connections	24	20
Per capita country GNP in 1989	$120–340	52	46
	$360–650	32	28
	$710–1,000	13	11
	$1,010–1,760	17	15
Average annual village income	$0–199	81	67
	$200–399	16	13
	$400–599	14	12
	$600+	10	8

involved; approximately 38 percent of these projects had more than 200 staff members.

In keeping with the focus of the study on one subsector, only projects whose primary objective was implementation of rural water systems were selected. However, since donors often promulgate an integrated approach to water systems, many projects included components for sanitation construction and other primary health care activities (49 percent). Another 7 percent of projects included income-generation activities.

Technology type. The projects included a range of technologies, from spring captures to power-pumped, piped-water systems. Overall, 36 percent of the projects installed just one type of technology, 46 percent used two or three different technology systems, and 18 percent installed four or more different types of systems. Twenty percent of the projects included household connections; 25 percent, community standposts; and 53 percent, handpumps. The remainder were spring captures or rain tanks. Only in 10 percent of the cases were communities given any choice of technology.

Income. Three items focused on income levels: *per capita gross national product* (GNP), *per capita client income,* and *village income.* Clearly, projects were targeted to the poorest countries: approximately 75 percent of the projects were from countries with annual per capita GNP of less than $650. Intercoder reliability on client and village income was low, particularly for the type of client most served. Hence, unfortunately, these two measures had to be excluded from further analysis.

Measuring the Variables Included in the Model

The model groups variables in six categories: (1) performance outcomes; (2) beneficiary participation; (3) nonparticipation determinants; (4) proximate determinants of outcomes; (5) determinants of participation; and (6) intermediate steps to participation. Each category is discussed below.

Performance outcomes. Performance outcomes were of two types, water-related outcomes and capacity building (or empowerment) outcomes. (See table 3.2 for a summary of the outcome variables that were included in the model.)

Water-related outcomes covered six performance variables. *Overall project effectiveness* is the key outcome variable used in the study; it was rated on a scale of 0 through 10. Overall effectiveness measured all project costs and benefits in the areas of construction, operations and maintenance (O&M), health and sanitation education, extension and community development, institutional development, and income generation. Several maintenance measures were coded and one was selected for inclusion in the model: *percentage of water systems functioning and in good condition.* The measure addressed only downtime after breakdown during normal times, which excluded natural calamities such as floods and drought.

Access to and use of new or improved water systems can produce several benefits, namely, time savings, other income-generating activities, and improved health. The *economic benefits* variable encompassed all of these measures. Coverage achieved by improved water systems—that is, *percentage of the target population who used the improved system*—was included as another performance indicator in the analysis.

Two other variables of a slightly different nature, *equality of access* (whether everyone had equal access to the water system) and *environmental effects,* were also included. Although drinking water projects are generally not

Table 3.2. Measures of performance outcomes and participation

Performance outcomes
Water-related outcomes
Overall project effectiveness
Percentage of water systems functioning and in good condition
Economic benefits
Percentage of target population reached
Equality of access
Environmental effects
Capacity building outcomes
Community empowerment
Women's empowerment
Capacity and skills related to water systems
Strengthened local organizations
Strengthened local leaders
Beneficiary participation
Overall beneficiary participation
Overall women's participation
Participation in design
Women's participation in design
Participation in construction
Women's participation in construction
Participation in operation and maintenance
Women's participation in operation and maintenance

expected to have a significant environmental impact, they do have the potential to improve reforestation or greenery or to adversely affect the environment by waterlogging the area immediately surrounding the project.

Local capacity is essential to achieving sustainability, so five capacity building (or empowerment) outcomes at the individual level and at the group or organizational level were chosen for inclusion: *overall beneficiary empowerment, women's empowerment, increased skills in water-related tasks, strengthened local organizations,* and *strengthened local leaders.*

Beneficiary participation. Several different measures of participation were selected for the model. The lower end of the scale represented information sharing; at the higher end were decisionmaking and control. The measures included an indicator of overall participation of beneficiaries in all aspects and stages of the project. The other measures focused on gender and participation during a particular stage of the project.

Nonparticipation determinants of outcomes. Obviously, beneficiary participation is not the only determinant of project outcomes. A range of exogenous variables affects outcomes directly, and another category of variables affects outcomes either directly or indirectly through participation. Table 3.3 lists these determinants of outcomes.

There were seven variables in the first set of direct determinants, primarily focusing on general project characteristics and per capita GNP. The second set of direct and indirect variables were grouped into five subcategories: *technology, external agents, client characteristics, external climate,* and *management.*

Proximate determinants of outcomes. This set of variables included those factors through which, it was hypothesized, beneficiary participation worked to effect outcomes. In a sense, then, these variables are intermediate ones on the way to determining final outcomes. Variables in this category were classified as institutional or physical. Institutional variables covered the *quality of project design* and *quality of implementation.* Physical variables included the *quality of construction* and *operations and maintenance.* Since O&M is such a major issue, two other intermediate outputs were added to the model: *maintenance after one year* and *maintenance after five years.*

Participation determinants. Overall beneficiary participation is determined by characteristics of the beneficiaries and the agency. (See table 3.4 for a listing of the determinants and elements of participation.) If both beneficiaries and agencies perceive the net benefits of participation to be high, participation can occur. An overall measure of perceived net benefits was developed after coders separately rated agency and beneficiary costs and benefits

Net benefits are a function of client and agency characteristics, which themselves are determinants of overall participation. Client characteristics included the demand of clients, or the commitment clients made before implementation of the project; the skills and knowledge of clients; the quality of broad-based leadership; the dependence on strong leaders; the social organi-

Table 3.3. Nonparticipation determinants of outcomes

Direct determinants
Total cost
Project complexity
Adequacy of facilities and equipment
Difficulty in recruiting and retaining staff
Availability of spare parts and technicians
Extent objectives clearly specified
Per capita GNP
Direct and indirect determinants
Technology
Type of technology (sophistication of technology)
Appropriateness of technology
External agents
Support of host government
Understanding between agencies
Client characteristics
Average number of users per system
Presence of other water sources
Village income
External climate
Conduciveness of political climate
Conduciveness of economic climate
Conduciveness of sociocultural climate
Conduciveness of geological environment
Management
Overall quality of management
Skills of staff
Proximate determinants
Institutional outputs
Quality of project design
Quality of project implementation
Physical outputs
Quality of construction
Adequacy of operation and maintenance
Maintenance after one year
Maintenance after five years

Table 3.4. Determinants of participation

Determinants of participation
Client characteristics
Commitment of clients before implementation
Skills and knowledge
Quality of broad-based leadership
Dependence on strong leaders
Extent of organization of clients
Extent to which organization is based on traditional structure
Agency characteristics
Use of local knowledge
Extent to which participation is made a goal
Implementation flexibility
Autonomy of project and agency
Consensus on objectives
Degree to which the project is driven by physical targets
Net benefits of participation
Elements of participation
Agency-user relations
Responsiveness of agency to clients
Extent to which clients listen to agents
User voice and exit
Extent to which control and ownership became local
Extent to which clients exit
Dissatisfaction of clients
User investment in costs
Capital investment made by clients
Percentage of recurrent costs paid by users

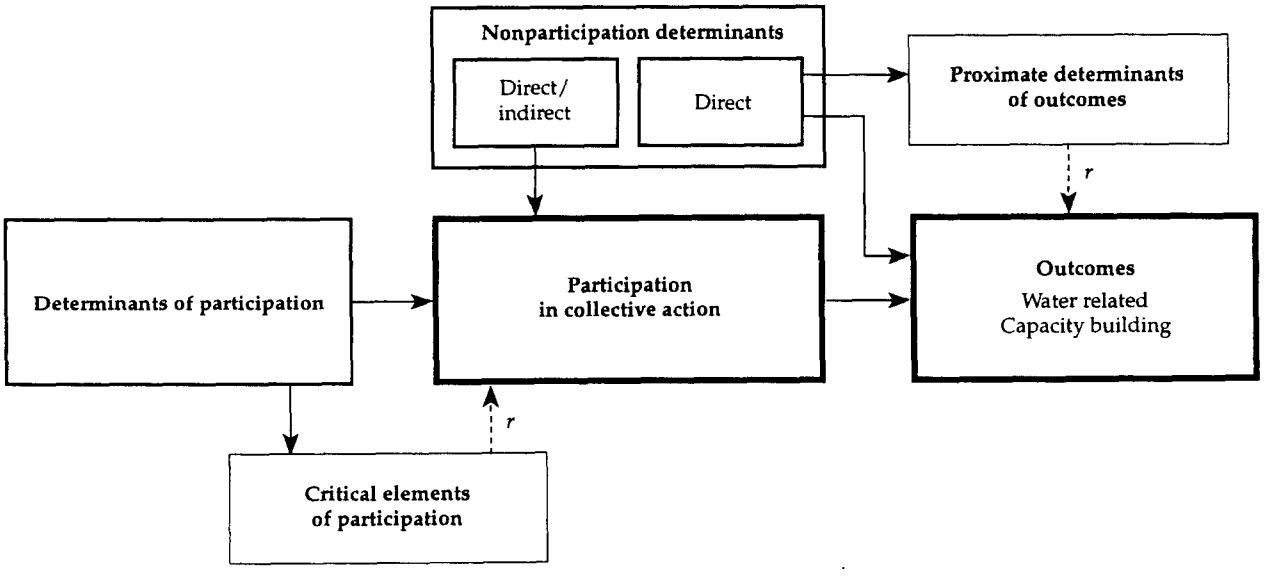
zation of clients to undertake water-related tasks; and the extent to which organization builds upon local traditions and structures. Important agency characteristics are use of local knowledge, degree to which beneficiary participation was made a goal, implementation flexibility, autonomy of an agency to manage its own affairs, consensus on objectives and means, and the degree to which the project was driven by physical targets.

Critical elements of the participation process. Participation is an iterative process; determinants of participation act through intermediate steps, which together lead toward high levels of overall participation. These steps are important milestones that arise as beneficiaries organize and as agencies put participatory plans of implementation into practice. The more important of these milestones are the responsiveness of agencies to client feedback; the extent to which clients listen to field agents; the extent to which local groups begin to gain control and ownership of resources; the users' dissatisfaction with or exit from the system; and the investment in capital and recurrent costs made by beneficiaries.

Schematic Presentation of the Model

Figure 3.1 is a schematic presentation of the model outlined above. The fundamental relationship of interest is between participation and outcomes (which are either water-related or more general capacity building outcomes). The model also posits nonparticipation factors that have an impact on outcomes. These are of two kinds: direct nonparticipation factors which influence outcomes independently, and direct and indirect

Figure 3.1. Model of the relationship of participation to outcomes and other factors



Note: r = correlation; it does not imply a causal relationship.

nonparticipation factors which exert their influence via the participation process. Finally, the model includes participation determinants, factors that lie behind and cause participation.

To account for some of the complexity and iterations of the processes at work, the model also incorporates two intermediate relationships. The first concerns direct nonparticipation determinants, working through a series of proximate determinants of outcomes. Similarly, the determinants of participation are assumed to work through what is called "critical elements of participation" in figure 3.1.

The model and the variables associated with each are elaborated in chapter 4 (which discusses the part of the model relating to outcomes) and chapter 5 (which addresses the part of the model relating to determinants of participation).

Other Notes on Research for the Model

Statistical analysis was conducted in phases. Frequencies, cross-tabulations, correlations,[3] factor analyses, and a limited number of multivariate regression analyses[4] were performed after checking the quality of the data. The final round of data analysis, after item reduction,[5] consisted primarily of multivariate regression analysis for model testing.

In addition, results of this study were compared to those from other studies following an extensive review of the literature, and several reviews and evaluations of projects received after completion of the coding process were considered. Findings from the review of literature and these additional evaluation reports are highlighted when relevant.

CHAPTER 4

Role of Beneficiary Participation in Project Effectiveness

Project-specific evidence from around the world suggests that participation of users in decisionmaking produces more effective, and more sustainable, projects. There is surprisingly little quantitative, statistical evidence, however, that addresses the following questions:

- Is beneficiary participation an important independent contributor to project outcomes?
- What is the path of influence of beneficiary participation on project outcomes?

This chapter answers these questions by using the data on project outcomes, participation, and other factors described in chapter 3. (The pertinent part of the model under analysis is diagrammed in figure 4.1.) In short, the chapter concludes that the evidence suggests a strong, causal relationship between greater participation and improved project outcomes.

The following section describes the measurement of overall performance and of overall participation; it also reports the basic results for the bivariate relationship between performance and participation. The next section shows that the performance-to-participation relationship is strong even after controlling statistically (through multivariate regressions) for other determinants of project success. The third section shows that the relationship between participation and performance holds across several different subjective and objective indicators of project success; moreover, the relationship holds true for outcomes not directly related to water, such as community empowerment. The fourth section examines the sensitivity of the results to the fact that the data are subjective and therefore may be distorted by the "halo effect" (that is, evaluators, because they know the hypothesis being tested, may unwittingly attribute participation to successful projects, and vice versa).

Following these sections, which establish a strong, robust statistical association between participation and performance, are the two that present the evidence that this relationship is causal. The fifth section examines the path of influence of participation throughout the stages of the project to show how participation affects the proximate determinants of project success. The next part goes beyond the statistical evidence to show, using narratives of specific projects, how participation (or the lack thereof) directly influences project outcomes. Finally, the concluding section draws policy lessons from the evidence about participation and performance.

Participation and Project Effectiveness

Overall project effectiveness (OPE) is a global measure of project performance, which was coded from the project evaluation reports. Although there are many dimensions of project success, they are generally highly correlated with one another, and this overall measure appears to

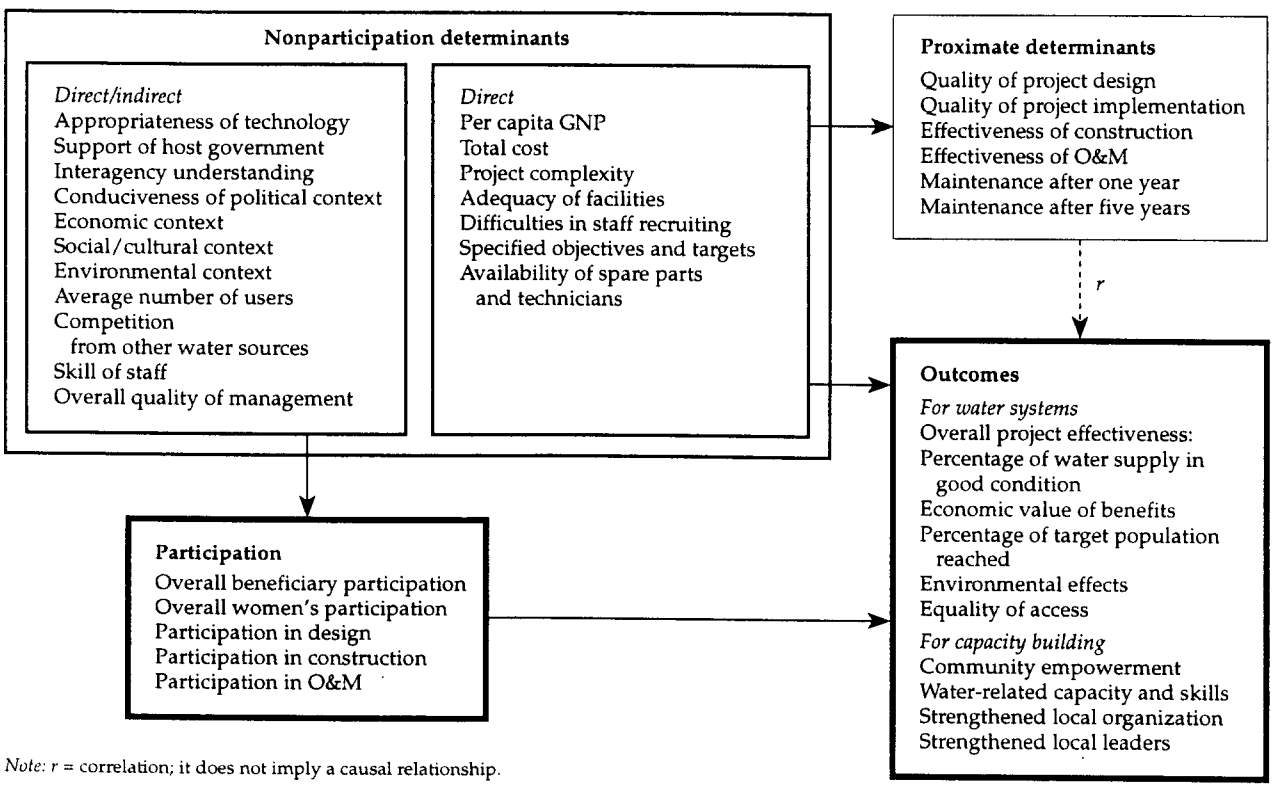
capture project effectiveness well.[6] Measures of other dimensions and aspects of project performance are discussed in later sections.

Participation is defined here as the extent to which beneficiaries were involved in information sharing, consultation, decision making, and initiating action in the program activities. Participation was scored on a 1–7 point scale, with 1 being little or no participation and 7 indicating high levels of decisionmaking by the community. In addition to overall participation, participation at three stages of the project cycle—design, construction, and operations & maintenance (O&M)—was also included; these analyses appear below, in the discussion of participation at various stages of project implementation. Participation by women was included as a separate variable. Overall beneficiary participation, from both men and women, correlated highly with the other measures and therefore will be used as the main measure of participation.[7]

Figure 4.2 reports the cross-tabulation between project effectiveness and beneficiary participation for the 121 projects.[8] There was only one project that was highly effective and yet low in participation, and no highly participatory projects were low in effectiveness. Only 3 percent (1 of 37) of projects with low participation were highly effective, in contrast to 31 percent (18 of 58) with medium participation and 81 percent (21 of 26) with high participation. Simply put, effective projects also tended to be participatory.[9]

A second test of the relationship of beneficiary participation to project performance is a bivariate linear regression (ordinary least squares) of OPE and participation.[10] Table 4.1, column 1, reports the partial correlation coefficient of overall beneficiary participation (OBP) on OPE. The estimate of 0.62 implies that the impact of increasing participation from a low level to a high level will improve project performance from between 1.0 to 2.5 points (on a 7-point scale). A 4-point increase in participation is associated with, on average, a 1.2 point increase in project performance. The *t*-statistic tests whether this estimate is consistent with the hypothesis that the association is zero. The value of the t-statistic at 10.6 implies that the estimate (0.62) is statistically different from zero at essen-

Figure 4.1. Model for testing the relationship of participation to performance outcomes



Note: r = correlation; it does not imply a causal relationship.

tially any significance level.[11] Thus the statistic implies a significant relationship between beneficiary participation and overall project effectiveness.

Participation and Other Performance Determinants

Evidence of a bivariate association is just the first step in establishing causality. Before drawing any inferences from the evidence of a strong bivariate association between participation and project effectiveness, it must be ascertained whether the association is due to the mutual association of performance and participation with some other variable (such as quality of management) that may be responsible for performance and participation. There may be a tendency for "all good things to go together" so that, for instance, projects with strong management are both more effective and more participatory. The second step toward establishing causality therefore is to test for the robustness of the participation variable in the presence of other important nonparticipatory determinants of project outcomes. In order to do so, a series of multivariate regressions was performed, adding a wide variety of factors that affect project outcomes directly (that is, not through participation) as well as both directly and potentially indirectly (that is, factors that directly affect performance but which may also have an effect on participation).[12]

Figure 4.2. Cross-tabulation of overall project effectiveness with beneficiary participation by number of projects

Overall project effectiveness

	Low	*Medium*	*High*	*Total*
Low	21	6	0	27 (22%)
Medium	15	34	5	54 (45%)
High	1	18	21	40 (33%)
Total	37 (31%)	58 (48%)	26 (21%)	121 (100%)

Overall beneficiary participation

Note: Percentages of the total number of projects are given in parentheses in the Total row and column.

Participation after Controlling for Direct Determinants

Based on the model charted in figure 3.1 and elaborated in figure 4.1, a set of seven project characteristics and exogenous factors, which were hypothesized to directly affect project outcomes, were added to the estimated equation for project effectiveness. These were (1) per capita GNP, (2) total cost, (3) project complexity, (4) adequacy of facilities, (5) difficulties in recruiting and retaining staff, (6) specified objectives and targets, and (7) availability of parts and repair technicians. Since the chapter is focused on participation, the results for these variables are discussed separately in box 4.1 (see also appendixes 1A and 1B).

The coefficient of overall beneficiary participation is reported in the first row, second column, of table 4.1. A bivariate correlation is likely to exaggerate the effect of any single "causal" variable with the seven direct determinants. Hence the magnitude of the estimated coefficient falls roughly in half (from 0.62 to 0.28), as one would expect from adding controls. The drop suggests that much of the bivariate association of participation to project effectiveness is attributable to the mutual association with the direct determinants of project success.[13] This conclusion is not surprising, since it is quite likely that one of the determinants of participation is the beneficiaries' expectation of project success. For example, one of the direct determinants of project success (see box 4.1) is the availability of spare parts. If clients know that spare parts are not available, they are unlikely to devote much effort to organizing for participation; the reverse holds, as well.

Even though the partial correlation of participation to project effectiveness is lower after con-

Table 4.1. Overall project effectiveness as a function of overall beneficiary participation

Model	*Regression 1*	*Regression 2*	*Regression 3*
Overall project effectiveness	0.62[d] (10.6) *n*=121	0.28[d] (5.3) *n*=77	0.24[c] (3.7) *n*=68

Note: Reported are the partial correlations and *t*-statistics (in parentheses) on OBP from three linear regressions, with OPE as the dependent variable, including different sets of independent variables: (1) OBP alone (bivariate), (2) OBP plus seven direct determinants, and (3) OBP plus seven direct and eleven direct/indirect determinants.

Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001. Numbers of projects for which the regressions were performed are indicated under the *t*-statistics.

trolling for direct determinants, the estimated impact is still large and strongly significant. The estimated impact implies that an increase of 1.0 point in participation is associated, all else constant, with about a 0.3 point increase in effectiveness. The t-statistic for the coefficient, 5.3, is still strongly significant. The conclusion, therefore, is that beneficiary participation remains a significant determinant of project effectiveness even after controlling for the effects of the seven direct factors.

Participation after Controlling for Both Direct and Direct and Indirect Determinants

Project performance is also determined by the range of factors that exert their influence either directly or through their effect on participation of clients. Factors that could have operated either way were classified as "direct/indirect"; these consisted of eleven variables, organized into five subsets. The major distinction of these variables is that part of their effect on project performance may arise from increasing participation, or that their effect on performance may be direct but affected nonetheless by participation. In either case the links are indirect. These variables were added to the model and a third set of multivariate regressions was run. The five subsets of variables included in the regression model were the following:

1. *Technology* (appropriateness of technology)
2. *External agents* (support of host government and interagency understanding)
3. *Client characteristics* (average number of users per system and competition from other sources)
4. *Exogenous climate* (conduciveness of political climate, conduciveness of economic context, conduciveness of the social and cultural context, and conduciveness of the geological and environmental context)
5. *Management* (skill and motivation of staff and quality of management).

The results for these variables are discussed in box 4.1.

Box 4.1. Impact of nonparticipation factors on outcomes for water projects, the environment, and equality outcomes

Model 2: direct factors

Availability of parts and the presence of repair technicians emerged as the most significant determinant of nearly all performance outcome measures in model 2.

Clarity of objectives and targets emerged as a significant determinant of overall project effectiveness, while adequacy of facilities and equipment turned out to be only somewhat important. Difficulty in recruiting and retaining staff was an important determinant of other more narrowly focused project outcomes.

As can be seen from appendix 1.A, the model had lower explanatory power for the percentage of target population reached. Compared to the other variables, this variable had the lowest intercoder reliability, .78.

Two other outcome measures were measured, which were qualitatively different from the water system outcomes: environmental effects and equality of access. Beneficiary participation emerged as the only important determinant of these outcomes in this model. The next set of variables employed have greater explanatory power for these outcomes, however.

The relationship between beneficiary participation and project outcomes remained strong regardless of variations in per capita GNP, project complexity, and total cost. A couple of cautionary notes are in order. The projects included in the study were primarily from the poorest countries, so the range of per capita GNP was narrow and at the low end of the income scale. Similarly, complexity measured the number of different organizations and activities to be coordinated, but these projects generally registered only low or medium complexity; only eleven projects (9 percent) were rated high in complexity. To some extent total cost can be taken as a proxy for project size. The findings seemed to indicate that total project size, as measured by total cost, neither has a bearing on project outcomes nor affects the importance of participation.

Model 3: direct/indirect factors

Availability of spare parts and presence of repair technicians remained an important input determinant. Other significant factors were appropriateness of technology and quality of management. Participation, however, remained significant even in the presence of these factors. Depending upon the specific output being considered, adequacy of facilities, difficulties in retaining staff, and clarity of objectives were important. (See appendix 1.B.)

It is equally important to note that per capita GNP and total cost of project, a proxy for project size, and project complexity did not determine project performance.

For measures of environmental effects and equality of access to facilities, beneficiary participation was the sole critical determinant in this model.

Results for the model that includes all variables are in the first row, third column of table 4.1. Controlling for this additional set of inputs reduces the estimated partial impact of participation only slightly, from 0.28 to 0.24. The effect is still strongly significant statistically. The multivariate results establish that, controlling for the effects of eighteen direct and indirect input variables, overall beneficiary participation remains a large and statistically significant determinant of overall project effectiveness.

Participation and Other Project Outcomes

A strong association between overall project effectiveness and participation raises two questions. First, to what extent is the association a result of the subjective nature of the assessment, both of those writing the project reports on which the data are based and of the coders who mapped the project evaluations into numbers? Second, what are the effects of participation on other aspects of project outcomes, including those not directly measured by effectiveness of water system projects, such as increasing community empowerment?

Participation and Overall Project Outcomes

Three additional measures of overall project outcome were selected (based on data quality and availability) for testing the basic model (figure 4.1). These are the *percentage of water systems in good condition*, the *overall economic benefits*, and the *percentage of the target population reached*. It is likely that these outcomes, because they measure more objectively verifiable quantitative achievements, are less subject to coder and reporter bias than is the evaluation of overall project effectiveness.

The results of using these outcome variables as the dependent variable are reported in table 4.2. Bivariate results are in column 1 and the results that include the set of direct and direct plus direct/indirect determinants are in columns 2 and 3. Overall beneficiary participation was found to be strongly significant statistically for all three outcomes. Moreover, the estimated magnitude of the participation effect is roughly the same as for overall project effectiveness.[14] For instance, for percentage of water supply in good condition, the estimated bivariate impact is 0.54, dropping to 0.29 (t-statistic of 2.4) with the inclusion of all direct and indirect determinants of project performance, as expected since there were no controls in the bivariate relationship. For the overall economic benefits and the fraction of the target population reached, the results are similar, with bivariate (and multivariate) partial correlations of 0.53 (0.26) and 0.29 (0.25), respectively. This strong similarity of results—all estimates from column three are between 0.25 and 0.29—from both overall subjective and physical indicators of project performance suggests that the halo effect of coders' subjective ascription of project effectiveness to participatory projects (or vice versa) does not appear to account for the positive correlation of participation with overall project effectiveness.

Table 4.2. Water project performance outcomes as a function of overall beneficiary participation

Model	*Regression 1*	*Regression 2*	*Regression 3*
Percentage of water system in good condition	0.54[d] (6.4) n=98	0.30[b] (3.1) n=64	0.29[a] (2.4) n=60
Overall economic benefits	0.53[d] (10.3) n=120	0.27[d] (4.1) n=77	0.26[c] (3.6) n=68
Percentage of the target population actually reached	0.29[d] (5.3) n=118	0.17[a] (1.9) n=76	0.25[b] (2.5) n=68

Note: Reported are the partial correlations and t-statistics (in parentheses) on OBP from three linear regressions, with OPE as the dependent variable, including different sets of independent variables: (1) OBP alone (bivariate), (2) OBP plus seven direct determinants, and (3) OBP plus seven direct and eleven direct/indirect determinants.

Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001. Numbers of projects for which the regressions were performed are indicated under the t-statistics.

Participation and Other Aspects of Water System Outcomes

Another water-system performance outcome, equality of access, was recorded.[15] Equality of access measured the degree to which people had access to improved facilities, or the degree to which anyone was denied access for political reasons or for nonpayment of fees. This measure was included because of its relevance to the important goal of reaching the poor. Beneficiary participation was a significant determinant of equality of access (see row 2, column 1, of table 4.3). The result is much less strong in the bivariate case,

Table 4.3. Relationship of participation to environmental benefits and equality of access

Model	*Regression 1*	*Regression 2*	*Regression 3*
Environmental benefits	0.21[d]	0.23[b]	0.23[a]
	(3.9)	(2.8)	(2.3)
	n=115	*n*=74	*n*=67
Equality of access	0.23[d]	0.26[a]	0.17
	(3.9)	(2.8)	(2.3)
	n=115	*n*=74	*n*=67

Note: Reported are the partial correlations and *t*-statistics (in parentheses) on OBP from three linear regressions, with OPE as the dependent variable, including different sets of independent variables: (1) OBP alone (bivariate), (2) OBP plus seven direct determinants, and (3) OBP plus seven direct and eleven direct/indirect determinants.

Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001. Numbers of projects for which the regressions were performed are indicated under the *t*-statistics.

however, and less strong overall than with other project outcomes.[16]

The relative weakness of the results for equality of access is not surprising, because greater participation could engender either greater or less access. Collective action works to the extent that a group of people can formulate and implement rules and regulations regarding entry and exit in using a common property resource. These rules and regulations are critical to preventing free-rider problems. Participation in decisionmaking is a means to formulate rules, and to achieve consensus on them and on their implementation. Hence high levels of participation may mean that access to water systems is successfully limited to those who agree to be responsible caretakers and owners. For example, in Honduras those who did not participate in construction, but who later wanted to be part of a piped-water system, had to pay higher connection fees. Most community groups do not deny access to water because of inability to pay fees, however. The world over, community groups have developed different criteria, dictated by cultural and social norms as well as by economic realities, to ensure access by the poor. In Tanzania, for example, even in poor villages user fees are based on a sliding scale, with widows and others identified as destitute being exempt from user fees. In other countries, the poor are allowed to pay with their labor rather than in cash.

Environmental benefits were also measured. The adjusted *R*-square for environmental effects is low. Compared to large infrastructure such as dams or river basin management, rural drinking-water projects have little dramatic impact on the environment. Nevertheless, the long-term environmental effects from waterlogging or from localized reforestation efforts can be significant. Results from the study show that other determinants—the geological and hydrological context, and the overall political context, which encourages environmental consciousness through legislation and education—are more significant for environmental benefits, although beneficiary participation remains important. The model has low explanatory power for this outcome. Again, participation might or might not lead to greater environmental benefits, depending on where the environmental costs fall. One possibility is that local communities might be expected to be less sensitive than other decisionmakers to nonlocal environmental costs.

Participation and Capacity Building Outcomes

Participation has been conceptualized in this study as a means to achieving project effectiveness, efficiency, equity, and empowerment. The limited number of project cases and the poor quality of the data did not allow testing of the efficiency hypothesis; this section focuses on capacity building and empowerment. These two outcomes are treated as variables, yet they may well be more properly classified as proximate determinants.

Participation in decisionmaking is an important capacity building process. As people participate in making new decisions and solving problems, learning takes place. This learning is internalized, because it is accomplished experientially rather than by rote. It therefore leads to changes in attitude, behavior, confidence, and leadership.

At the individual level are three social actors of particular importance, namely, women, men, and leaders. The question of women's empowerment and participation is important, but the issue is too complex to treat here; to highlight the findings and to do them justice, the subject will be covered fully in a separate paper. Findings on overall beneficiary participation and community empowerment follow.

Empowerment is a result of participation in decisionmaking. An empowered person is one who can take initiative, exert leadership, display

confidence, solve new problems, mobilize resources, and undertake new actions. Empowerment, it is hypothesized, is an important outcome of high levels of participation involving control over decisionmaking for a range of activities. Hence empowerment is a leading indicator of successful capacity building at the individual and institutional levels.

The second important indicator of capacity building or empowerment is specific to water and sanitation. Are the ability and skills of individuals enhanced in carrying out specific management and technical tasks related to water and sanitation?

The third indicator is organizational. Decentralized programs require strong local organizations. When local organizations get the opportunity to manage resources and support development, they can become stronger (Esman and Uphoff 1984; Uphoff 1986). Participation in decisionmaking is hypothesized to strengthen the capacity of local organizations to carry out activities. Local organizations can be a few people working on water committees, or a village council, or larger, more formal organizations.[17]

Finally, much has been written and said about the effect of participatory development on local leaders. The general belief is that local leaders resist participatory decisionmaking because it leads to empowerment, which changes the power balance and jeopardizes their power base. The often accompanying belief is that local leaders should be bypassed because they either resist broad-based decisionmaking or capture a disproportionate share of resources. On the other hand, when local leaders get involved they can be effective in mobilizing communities and accessing resources. Although the process may enable community groups to become more powerful, it can also allow leaders to emerge with more power and respect. For this reason a variable on the net effect of participation on local leaders was included in the model.

Table 4.4 reports the coefficients of participation for three models, with *t*-statistics in brackets. The results confirm the hypothesis that beneficiary participation is deeply embedded in all four capacity building or empowerment indicators, since community empowerment and skills related to water-system tasks are determined by beneficiary participation even after controlling for all eighteen direct and indirect input variables.

Beneficiary participation is even more positively related to the other two outcomes not specific to water projects: strengthened local organizations and effect on local leaders. Clearly, participatory decisionmaking does lead to strengthened local organizations, as evidenced in several ways: a greater sense of pride and identity with the village council or water committee or group; undertaking of new activities, from latrine building to brick and cloth making; greater political savvy and ability to negotiate with (or pressure) political leaders and outside agencies to change rules and regulations, or to mobilize additional resources.

Evidence also establishes that the net effect of participation on local leaders is positive, not negative. An increasing number of projects work through local leaders, win their support, and then reach out to others in a community, including the poor. Often people prefer that their leaders make the decisions and negotiate with the outside world. The status of such leaders is enhanced when they successfully bring resources to the community. Many leaders, once they are satisfied that they are not being bypassed, become either personally involved in stimulating collective action or supportive of others, thus allowing the emergence of new leaders.

Table 4.4. Outcomes not specific to water systems, as a function of overall beneficiary participation

Model	*Regression 1*	*Regression 2*	*Regression 3*
Community empowerment	0.77[d] (15.6) n=121	0.59[d] (8.2) n=77	0.55[d] (6.7) n=68
Water supply task capacity building	0.77[d] (14.9) n=121	0.70[d] (8.3) n=77	0.63[d] (6.3) n=68
Extent local organizations strengthened	0.99[d] (17.1) n=109	1.01[d] (10.0) n=71	0.98[d] (8.1) n=63
Net effect on local leaders	0.24[d] (4.6) n=106	0.26[b] (3.0) n=70	0.26[b] (2.4) n=64

Note: Reported are the partial correlations and *t*-statistics (in parentheses) on OBP from three linear regressions, with OPE as the dependent variable, including different sets of independent variables: (1) OBP alone (bivariate), (2) OBP plus seven direct determinants, and (3) OBP plus seven direct and eleven direct/indirect determinants.

Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001.

Numbers of projects for which the regressions were performed are indicated under the *t*-statistics.

How Important Is the "Halo Effect"?

The case review method uses systematic content analysis, which is based on subjective evaluation by coders of facts and findings reported in documents. It assumes that each coder will be able to subjectively judge and quantify the diverse phenomena. There are two ways in which this coding could go wrong. Either the codings could be subject to a large degree of random error or the coders could be influenced in their assessments of the outcomes by their assessments of participation.

The first problem, random measurement error, is not a major concern for two reasons. First, all of the variables used in the analysis show a high degree of intercoder reliability, in that the correlations of the same variable across projects for the two different coders are quite high.[18] Second, a measurement error, if there were one, would lead to an *underestimation* of the coefficients.[19] In other words, if the results are strong and statistically significant in the presence of measurement error, they would only be stronger and more significant if that error were absent. Hence the possible objection that the measured variables could be contaminated by a large degree of measurement error is moot as a criticism of the present results.

The much more serious concern is that subjective evaluations are susceptible to two types of nonrandom measurement error. First, if coders rate both outcomes and inputs, their ratings of project outputs may be influenced by their knowledge of system inputs. This is more likely to happen if the coders know the hypotheses being tested. Second, if project inputs and selected project outputs tend to be positive, that is, good things in their own right, the subjective evaluations of overall project effectiveness—by the original reporters as well as by the coders—may be upwardly biased. This is known as the halo effect.

Two types of analyses were conducted to check for the pervasiveness of the halo effect. The first, already discussed elsewhere in this chapter, is the use of objective measures of project outcome, such as the percentage of the water system in good condition. The reporting and coding of the outputs of such objective measures should reduce the halo effect, although it still may be the case that the degree of participation is overstated when project outcomes are good.

The second technique for examining the halo effect is to take advantage of the fact that two coders coded both outcomes and inputs. If it were the case that a higher assessment of outcomes led to a higher assessment of participation, then the "within"-coder results should be stronger that the "across"-coder results. That is, if X's assessment of OBP is higher when X gives OPE a higher rating, then the regression of X's OPE on OBP should have an upward bias relative to the regression of OPE coded by X on OBP coded by Y (whose assessment of OBP is not influenced by X's assessment of OPE).[20] Table 4.5 shows the results of exactly this test. The first row reproduces the results from table 4.1 of OPE on OBP, both bivariate and multivariate (for the most inclusive model). The second and third rows regress X's (or Y's) values for OPE on Y's (X's) values for the independent variables. There is no significant drop in the estimated coefficients. The results are the roughly the same, which is consistent with no halo effect.[21]

Yet resolving the issue of coder halo effect does not negate the possibility that the writers of the project evaluations themselves built the halo effect into the reports that were subsequently coded. Any halo effect operating on the writers of evaluation reports is likely to be weak, however, since participation was not a focus of those reports and the evaluators did not know that their reports would be used as data for a study on participation.

Table 4.5. Tests for intercoder "halo effects" in coding project effectiveness and participation

Test	*Bivariate relationship between OBP and OPE*	*Multivariate relationship (all inputs) to OPE*
Mean values: (X+Y)/2	0.62[d] (10.6)	0.24[c] (3.7)
Coder X outputs on coder Y inputs	0.62[d] (10.3)	0.26[a] (2.1)
Coder Y outputs on coder X inputs	0.57[d] (9.3)	0.26[a] (2.7)

Note: Reported are the partial correlations and *t*-statistics (in parentheses) on OBP from three linear regressions, with OPE as the dependent variable, including different sets of independent variables: (1) OBP alone (bivariate), (2) OBP plus seven direct determinants, and (3) OBP plus seven direct and eleven direct/indirect determinants.

Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001.

Proximate Determinants and Participation

The foregoing sections established the existence of a strong, robust association between the level of beneficiary participation and project performance, but even this evidence falls short of proving that more participation *causes* better project performance. This section and the following one move beyond statistical association, to make a case implying causation and to give meaning to the statistics by highlighting specific project experiences. The present section does so by showing that participation is related to success in each of the stages of a project, revealing the mechanisms whereby participation causes success. The section on project experiences uses case studies to illustrate patterns and processes used in linking participation to improved project effectiveness.[22]

The model diagrammed in figure 4.1 identifies a series of proximate determinants of project outcomes, which are the stages of a project (design, implementation, construction, and maintenance). It is hypothesized that beneficiary participation affects final outcomes by affecting outcomes at each of these stages. Multivariate regressions were performed to test these hypothesized relationships between proximate determinants and outcomes.

Success in the stages of a project, or proximate determinants, leads to successful project outcomes. For example, better "quality of design" should lead to a more effective project (although better design quality, as an outcome itself, is not an independent cause of a better outcome). If this is true, the correlation coefficients between the set of proximate determinants and outcomes should be high and significant. Table 4.6 reports these bivariate correlations. Looking down column 1, the correlations between overall project effectiveness and the quality of each of the project stages is very high. The same holds true for the other measures of project success, although, not surprisingly, the correlation is less strong for the environmental and equality outcomes.

Institutional Inputs

To explore the path through which beneficiary participation effects outcomes, the proximate determinants were divided into two broad categories: *institutional outputs* concern the design and implementation of a project, and *physical outputs* concern the construction and maintenance of water systems. Few would dispute that project outputs are influenced by overall quality of project design and by quality of project implementation. Early involvement of project beneficiaries and other stakeholders not only improves project design but also begins the process of local ownership of projects, which is critical for achieving sustainability. While the importance of getting project design right has long been understood,

Table 4.6. Bivariate correlations between outcomes and proximate determinants

	Outcome variable					
Proximate determinant	*Overall project effectiveness*	*Percentage of water system in good condition*	*Objective value of benefits*	*Percentage of target population reached*	*Environmental effects*	*Equality of access*
Quality of design	0.81[d] (*n*=121)	0.66[d] (*n*=98)	0.70[d] (*n*=120)	0.43[d] (*n*=118)	0.34[c] (*n*=115)	0.32[c] (*n*=112)
Quality of implementation	0.92[d] (*n*=121)	0.75[d] (*n*=98)	0.78[d] (*n*=120)	0.50[d] (*n*=118)	0.38[d] (*n*=115)	0.39[d] (*n*=112)
Quality of construction	0.61[d] (*n*=121)	0.59[d] (*n*=98)	0.55[d] (*n*=120)	0.53[d] (*n*=118)	0.26[b] (*n*=115)	0.29[c] (*n*=112)
Quality of O&M	0.90[d] (*n*=121)	0.83[d] (*n*=98)	0.77[d] (*n*=120)	0.42[d] (*n*=118)	0.30[c] (*n*=115)	0.31[c] (*n*=112)
Quality of maintenance after one year	0.85[d] (*n*=117)	0.89[d] (*n*=98)	0.74[d] (*n*=116)	0.40[d] (*n*=114)	0.35[d] (*n*=111)	0.29[b] (*n*=108)
Quality of maintenance after five years	0.81[d] (*n*=74)	0.87[d] (*n*=70)	0.72[d] (*n*=73)	0.47[d] (*n*=71)	0.37[c] (*n*=70)	0.33[b] (*n*=67)

Note: Reported are the partial correlations and *t*-statistics (in parentheses) on OBP from three linear regressions, with OPE as the dependent variable, including different sets of independent variables: (1) OBP alone (bivariate), (2) OBP plus seven direct determinants, and (3) OBP plus seven direct and eleven direct/indirect determinants.

Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001. The number of projects under consideration are in parentheses.

only recently has attention shifted to ensuring quality of implementation to achieve high-quality project outputs. The two proximate inputs examined here, then, are overall project design and overall quality of implementation.

Quality of design. Table 4.7 lists the coefficient on participation in each cell, with *t*-statistics in parentheses, for the bivariate and for two different multivariate regressions. For quality of design, beneficiary participation is significant only in the bivariate model. Given the general belief that early inputs from stakeholders in a project, including beneficiaries, are important in creating a design that fits the needs of project clients, the lack of a significant relationship across the board is puzzling.

But three issues must be kept in mind when interpreting these findings. First, statistically speaking, the lack of significance at the 5 percent level is not the only standard. Low precision can lead to statistical insignificance even when the qualitative relationship is substantial. Moreover, the coefficient itself is not much lower for design (0.16) than for implementation (0.21), which was significant at the 0.01 level. Second, clients include people at the community level—the ultimate project beneficiaries and stakeholders—agency staff, and others who will be directly affected by the project. The staff of public sector agencies, through which most large rural water supply projects have been implemented, were included in the measure used in this study of beneficiaries, but other project stakeholders were not.

Table 4.7. Impact of overall beneficiary participation on the institutional proximate determinants of project performance

Proximate determinant	*Regression 1*	*Regression 2*	*Regression 3*
Quality of design	0.46[d]	0.12	0.16
	(6.9)	(1.3)	(1.3)
	n=118	*n*=76	*n*=68
Quality of implementation	0.53[d]	0.17[b]	0.21[b]
	(9.3)	(2.7)	(2.7)
	n=121	*n*=77	*n*=68

Note: Reported are the partial correlations and *t*-statistics (in parentheses) on OBP from three linear regressions, with OPE as the dependent variable, including different sets of independent variables: (1) OBP alone (bivariate), (2) OBP plus seven direct determinants, and (3) OBP plus seven direct and eleven direct/indirect determinants.

Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001. Numbers of projects for which the regressions were performed are indicated under the *t*-statistics.

Third, there are two ways of making projects responsive to beneficiary demand: beneficiaries can be involved indirectly or directly. This measure captures only direct involvement, although indirect involvement, as evaluated by other techniques, is considered in the study's overall findings. Indirect involvement includes market surveys, beneficiary assessment, contingent valuation methods to assess willingness to pay, sociological and anthropological studies, and other consultation techniques which produce information on the needs, preferences, capacity, and social and political organization of beneficiaries and intermediary organizations. Indirect information can also be drawn from lessons learned from other projects attempting to provide services to the poor, and then fed into the design process.

Indirect involvement of beneficiaries in design was rated low in participation in the study; the majority of projects did not involve beneficiaries in design at all. Only six projects actually involved beneficiaries directly in decisionmaking for design, so the spread of projects in the highly participatory category was very low. Direct beneficiary participation means beneficiaries work together with project authorities in evolving the design of the project. This kind of involvement is rare, except through the involvement of NGOs and through pilot implementation activities during the process of project formulation; again, lessons from these experiences are fed into the design of the project.

What the results suggest, then, is that the critical factors in macroproject design may be consultative processes and broad stakeholder involvement rather than direct and intensive involvement of large numbers of beneficiaries. Besides participation, the factors of importance in the model were the quality of attention paid to availability of spare parts and repair technicians (significant beyond the 0.0001 level); the number of users per water system, as specified by design criteria (a negative relationship significant at the 0.06 level);[23] and the overall complexity of the project (a negative relationship significant at the 0.08 level).[24]

Quality of implementation. Beneficiary participation is significantly related to quality of implementation in the bivariate model and in both multivariate equations even after controlling for

the effects of other inputs, which means, of course, that it is a significant determinant of the quality of implementation. In fact, OBP is *the* critical determinant of overall quality of implementation. The implications of these findings are important for project design and management processes.

Two other input variables of significance were (1) clarity of objectives and targets and (2) availability of spare parts and repair technicians. When the design of individual subprojects is evolving through the process of implementation and all the details of implementation vary from site to site, it is particularly important to be clear on overriding objectives and targets. Strategies can then be adapted to the local context but still achieve defined objectives and targets.

Physical Outputs and Participation

Many factors affect construction and operation and maintenance, or intermediate physical outputs. These two components are treated separately because, in the past, the water sector has equated participation with free labor and materials or with handing over O&M to communities after construction had been completed. In both scenarios, although communities were asked to "do something," they were not part of the decisionmaking process. Neither approach treats participation as a process.

Effectiveness of construction. The contribution of beneficiary participation to construction effectiveness is significant only in the bivariate model (table 4.8). It is not significant in either of the multivariate models. Thus, when controlling for the effects of other inputs, beneficiary participation no longer remains a significant determinant of construction quality, although it is marginally significant in the limited multivariate results (column 2, *p*-level of 0.075); also, as discussed elsewhere, the full multivariate results may understate the true total effect.

In the multivariate model that included all direct and indirect inputs, three inputs did emerge as significant for the quality of construction. They were *project complexity* (significant at the 0.01 level), *conduciveness of economic context* (significant at the at 0.003 level), and *average number of users per system* (significant at the 0.02 level). Project complexity once again emerged as a significant negative determinant (–0.30), as did number of users per system (–0.30). Effectiveness of construction was the most severely affected by the overall economic context (0.59). The worse the economic context, the worse the quality of construction. This finding makes sense. When there is high inflation or dependence on highly taxed imports, or when economic conditions are poor and markets are not functioning effectively, the quality of physical construction is negatively affected.

Although communities actually led the construction for some projects, historically the norm has been that communities provide unskilled labor and participate in the manner dictated by the construction contractors. Generally, the contractor is accountable not to the communities but to external, governmental or nongovernmental agents. Contractors therefore have had little incentive to interact with people in local communities, whom they see as fonts of free housing, construction assistance, and unpaid labor, not as decisionmakers who will certify that construction has been satisfactorily completed. Project experience also establishes that even when construction is led by communities, timely technical assistance is helpful in assessing quality of construction.

Effectiveness of O&M. Three different measures of project operations and maintenance were coded from the project reports: *effectiveness of*

Table 4.8. Impact of overall beneficiary participation on the physical outputs related to project performance

Output	*Regression 1*	*Regression 2*	*Regression 3*
Effectiveness of construction	0.30[d] (4.6) *n*=120	0.18 (1.8) *n*=77	0.11 (0.9) *n*=68
Effectiveness of O&M	0.49[d] (7.4) *n*=121	0.14[a] (2.0) *n*=77	0.11 (1.1) *n*=68
Maintenance after one year	0.43[d] (6.6) *n*=117	0.16[a] (2.0) *n*=75	0.18 (1.8) *n*=66
Maintenance after five years	0.46[d] (4.9) *n*=74	0.09 (0.7) *n*=49	0.25 (1.5) *n*=45

Note: Reported are the partial correlations and *t*-statistics (in parentheses) on OBP from three linear regressions, with OPE as the dependent variable, including different sets of independent variables: (1) OBP alone (bivariate), (2) OBP plus seven direct determinants, and (3) OBP plus seven direct and eleven direct/indirect determinants.

Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001. Numbers of projects for which the regressions were performed are indicated under the *t*-statistics.

O&M, maintenance after one year, and *maintenance after five years.* Since the results for all three were similar (as expected, because they are highly correlated), they will be discussed together. Beneficiary participation is a significant bivariate correlate of O&M with all three variables.

Controlling for the seven direct determinants of project success again lowers the estimated impact. But for two of the three measures, participation remains a significant determinant of success in O&M. As with the outcomes for water system conditions, effective O&M depends heavily on the availability of spare parts and on the presence of repair technicians.

When all input variables are included in the equations for maintenance, however, the estimates of the effect of participation drops to modestly insignificant levels. The estimates range from 0.11 (for effectiveness of O&M) to 0.25 (for maintenance after five years). In the full multivariate model, the availability of parts remains as the only significant determinant of maintenance success. But here again arise the difficulties of interpreting the results of a "kitchen-sink torture test." Including eighteen variables both reduces the available sample of projects and decreases the degrees of freedom, either of which can be expected to lower the precision of the estimates of the participation effect, independent of the effect of the estimate. What is surprising, then, is that so many of the results survived the torture of testing with a large number of covariates, not that some of them failed (in a statistical sense) to survive.

Examining the impact of participation at various stages of the project is the final step in tracing out the effect of participation in general. This examination is particularly interesting, given that programs reluctant to change their way of doing business typically tagged on beneficiary participation at the end of the project (the "handing over" syndrome) or limited participation to the construction phase and to contributions of free labor and local materials. The data suggest that neither approach has the desired effect on any intermediate outcome, institutional or physical.

To test for the lack of efficacy of piecemeal participation or of participation by command, a series of multivariate regressions were conducted matching participation during a particular stage of the cycle with the particular outcome, rather than with overall participation. For example, table 4.9 reports multivariate regression testing for all models for the effect of participation in design (with *quality of design*); participation in construction (on *quality of construction*); and participation in O&M (on *quality of O&M*).

The results establish that participation in one or another stage of a project does not by itself positively affect proximate determinants of outcomes. The coefficient values for the bivariate and multivariate models are lower than when tested for overall beneficiary participation across stages. The findings confirm that participation is a *process* whose benefits cannot be fully realized when limited to particular stages of implementation. For maximum benefits, beneficiary participation needs to be viewed as a long-term process that necessitates involvement of users from the beginning of a project to its end.

Table 4.9. Proximate determinants of water project outcomes as a function of beneficiary participation in different stages

Project stage	*Proximate determinant*	*Bivariate model 1*	*Limited multivariate model 2*	*Full multivariate model 3*
Beneficiary participation in design	Quality of design	0.26[d]	0.12	0.14
		(3.6)	(1.7)	(1.5)
		n=113	*n*=72	*n*=64
Beneficiary participation in construction	Effectiveness of construction	0.20[c]	0.13	0.13
		(3.3)	(1.7)	(1.6)
		n=117	*n*=76	*n*=67
Beneficiary participation in O&M	Effectiveness of O&M	0.39[d]	0.08	0.05
		(6.5)	(1.4)	(0.7)
		n=119	*n*=77	*n*=68

Note: Reported are the partial correlations and *t*-statistics (in parentheses) on OBP from three linear regressions, with OPE as the dependent variable, including different sets of independent variables: (1) OBP alone (bivariate), (2) OBP plus seven direct determinants, and (3) OBP plus seven direct and eleven direct/indirect determinants.

Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001. Numbers of projects for which the regressions were performed are indicated under the *t*-statistics.

Project Experience with Beneficiary Participation

The results insofar reported in the chapter establish statistically the positive relationships between project outcomes and participation. Yet the statistics, which are themselves derived from project experiences, do not tell the whole story. To untangle causal linkages, and to understand the processes and problems in managing rural water supply programs, the project experiences have to be examined in depth.

This section looks at project experiences over the last two decades and highlights three key findings:

- Beneficiary participation leads to project effectiveness, but the forms of participation vary from context to context.
- To achieve sustainable operation and maintenance requires beneficiary participation, spare parts, and repair technicians. Training technicians and distributing spare parts are easier tasks than achieving participation in decisionmaking, which requires simultaneously that beneficiaries be interested and involved in O&M and that agencies give up control.
- For maximum benefits, participation has to be viewed as a process that involves beneficiaries in decisionmaking from the beginning to the end of a project. A command-and-control approach to participation does not work.

Forms of Participation Vary

The statistical findings establish that highly effective projects also tended to be highly participatory. Some of the key characteristics of the twenty most effective projects have been summarized in appendix 2. Sixteen of the twenty most effective projects also scored the highest in overall participation. The forms of participation during the various stages of the projects and the mechanisms used to foster participation varied widely in the different economic, cultural, and political contexts, however. Boxes 4.2, 4.3, and 4.4 illustrate three very different projects, all of which were highly effective and participatory. Box 4.2 highlights a project in Paraguay, which achieved a sustainable rural water supply through institutional and fiscal reform, combined with community organization activities based on community demand. Communities invest in the system and legally own the water systems.

Box 4.3 describes the Aguthi water supply project in Kenya and the involvement of a parastatal organization, which enjoyed a greater degree of fiscal autonomy than is typical of government departments. The Aguthi community initiated the project but turned over responsibility for operation and maintenance to the parastatal agency.

Box 4.4 focuses on the Azad Jammu and Kashmir (AJK) province of Pakistan. In the last fifteen years community action, supported by the local government, has resulted in construction of 1,200 kilometers of roads and in 40 percent greater access to safe water. Local leaders and the rich elite in AJK play leading roles in negotiating with government authorities, in planning systems, and in setting tariffs. Almost every community has a functioning system and keeps monthly financial records; many expand the water system on their own (S. Khan 1992; Minnatullah 1993).

Sustainable O&M: Participation, Spare Parts, and Agency Control

Beneficiary participation, availability of spare parts and repair technicians, and appropriateness of technology were significant determinants of overall project effectiveness. Beneficiary participation in decisionmaking was also important in achieving effective operation and maintenance, but such participation implies that agencies must let go of decisionmaking at the microlevel. Agencies, especially government engineering departments, have found this particularly difficult to accomplish, as the study results reflect. Of the twenty most effective projects in this study, only three were implemented primarily by government engineering and water works departments.

Of course, beneficiary participation cannot correct for inappropriate technologies or lack of spare parts and repair technicians. Yet even if spare parts and technicians are available, they will not be used, in most situations, unless the community has an interest and stake in keeping systems in good order.

These findings are the problems that have plagued the rural water supply sector. By the end of the 1970s there was increasing recognition that greater access to safe facilities was not the only issue; facilities had to be maintained to ensure their functioning after construction, as well. Government, it was also clear, could not sustain central maintenance systems. These insights led in the 1980s to the development of different types of decentralized maintenance systems, ranging from privatized to government-managed two- or three-tier systems.

The success of the these variations depended on creating responsibility for simple repairs at the community level, through "community participation," and on making spare parts easily available. As a decade of experience attests, technology simplifications and distribution of spare parts in a sector dominated by engineers was the easier of the two tasks, and much attention was devoted to it. Nevertheless, in the absence of meaningful community participation by local people and local responsibility and incentive for undertaking repairs, the presence of appropriate technology and spare parts did not solve the O&M problems. Three cases illustrate the difficulties with government-led maintenance systems.

India: three-tier maintenance systems. The three-tier maintenance system was developed in India in the 1970s in an attempt to create sustainable O&M for village-level water systems. The central government, which had been largely unsuccessful in achieving this goal, saw decentralization as the key to long-term sustainability of water systems.

In the three-tier system, responsibility for maintenance is decentralized and tasks are assigned to one of three levels. The community is the first tier, which is responsible for basic and preventive maintenance. The second tier, at the

Box 4.2. Paraguay: institutional and fiscal reforms

The $12.5 million, World Bank-funded rural water supply project in Paraguay had the objective to "promote community commitment to, and participation in, the project" to help achieve long-term sustainability. To achieve this goal, the project employed a number of strategies based on capacity building and establishing clearly defined, legally binding responsibilities between the executing agency and each community.

The capacity building component focused primarily on the executing agency, the National Service of Environmental Sanitation (SENASA), a subdivision of the Ministry of Health. SENASA was a relatively new, untried organization and needed extensive support in a number of areas. The project provided capacity building in such areas as finance, information systems, community organization, tariffs, and design and construction standards. Building capacity did take time: the project took four years longer to implement than had been originally estimated. By sticking to a participatory approach, however, and taking the time to develop SENASA's institutional capabilities—instead of bringing in an outside organization to fulfill short-term construction goals—the project helped to create a stronger overall institutional structure and increased the likelihood of achieving long-term sustainability.

The responsibilities component addressed the subproject negotiations between SENASA and each community. Before SENASA contracted with a junta for the construction of the water system, the community had to fulfill the following legally binding steps:

1. *Junta formation.* The community had to follow project guidelines for forming a Water and Sanitation Committee (junta), which is duly recognized as a legal entity by the Government of Paraguay.

2. *Project description/agreement.* The community and SENASA had to negotiate and sign a project agreement, which included a detailed description of each project component and its quantities and costs. (The contract also lists all project plans and documents.)

3. *Users' contribution.* The junta had to agree to make a cash downpayment of 5 percent as a condition for starting construction; provide cash, labor, equipment, materials, land, or a combination thereof, equivalent to ten percent of the project costs; and take out a loan from SENASA, to be paid back at market interest rates in not more than ten years.

4. *Revenue covenant.* Each junta had to set tariffs for water service at a level sufficient to obtain revenues to cover routine O&M, debt service on the SENASA loan to the community, and major repairs and replacements (at an amount to be determined by SENASA and the junta).

In fact, the project exceeded expectations: communities contributed 21 percent of total construction costs (6 percent over original estimates), and the project serves almost 20,000 people more than originally estimated. Operation and maintenance is satisfactory, and the majority of systems provide adequate service. The juntas are well-motivated, manage systems satisfactorily, meet most financial commitments, and have little trouble collecting revenues.

Source: World Bank (1987).

subdistrict or ward level, is responsible for systems in several villages; a community calls in the second tier when minor breakdowns occur. Finally, the third tier, at the level of the district government, oversees the second tier and is responsible for major repairs.

The three-tier system looked simple and straightforward on paper. Unfortunately, when put into practice, three-tier maintenance turned out to be much more complex than designers and program implementers had envisioned. Attempts to implement the system countrywide in several countries in Asia and Africa proved that many districts do not have the institutional capacity to effectively execute their responsibilities. An entire infrastructure (logistical, administrative, financial, and technical) is necessary at the district level to make the system work. In order to have any success in creating this infrastructure, central governments have to hand over financial and administrative control to the districts, which they have been reluctant to do.

The most ironic aspect of the three-tier system is that when districts *are* capable of executing their responsibilities effectively, communities and the second tier become dependent on the third tier and renege on their own maintenance responsibilities, which reintroduces the problems engendered by lack of community involvement—that is, sustainability of the water system is jeopardized. These problems stem in part from the design of the three-tier system, which focused more on structure than on the incentives that would be necessary to get communities to undertake repairs. Users have no meaningful role in the decisionmaking process and no technical, financial, or organizational control. In fact, in this system community inaction is rewarded: others eventually do the work for the community, at unaffordable cost to the agency.

In addition, the three-tier maintenance system is part of a bureaucratic structure that leaves little room for flexibility if a community wishes to contribute or develop a maintenance system outside the tier structure. One example from a nationwide study in Zimbabwe proves the point: a community had collected $179 toward the improvement of its water supply, but the District Council returned the money because, according to an official, the money "could not be used" (Cleaver 1990). The incentives

Box 4.3. Kenya: community participation with a parastatal agency

Effective community participation takes many different forms. The Aguthi rural water supply project in Kenya, for example, sprung from community initiative; long-term operation and maintenance is handled by the National Water Conservation and Pipeline Corporation (NWCPC), a parastatal agency. The piped-water system, with metered household connections, serves 68,000 people and cost approximately $6.5 million.

Phase I of the Aguthi project started with conventional contracting methods and no community participation; it was plagued with problems, including delays in construction, cost overruns, and disagreements over consumer payment methods. Eventually construction was halted, and it appeared that the project would not move forward.

At this point, the Aguthi Water Committee met with the Danish International Development Agency (DANIDA), the major funder, and the Ministry of Water Development; the committee offered to supply the necessary labor if DANIDA would take charge of project implementation. The project was redesigned, and the water committee, working with local leaders and project staff, mobilized the community. The committee facilitated community organization by explaining the essential role that community members played in the project—without their participation the project would not go forward and there would be no improved water system. Public meetings were held to explain the project fully to community members; villages were given four to six weeks to organize their participation and discuss any concerns or questions.

Communities contributed extensively to the project, some 93,000 person days, valued at approximately Ksh 2–2.5 million in all. Phase II of the project, with the help of this community participation, was completed on schedule and within the budget. As agreed, the community defined its role as paying monthly tariffs after construction was completed. O&M was handled successfully by the NWCPC.

NWCPC had a salary structure about 40 percent higher than that of the government, with high salary increases going to the lowest-level staff. In addition, NWCPC, unlike the Ministry of Water Development (which had to funnel funds through the Treasury), can use revenues directly to meet the costs of the project. These incentives helped NWCPC develop motivated staff who understood their jobs and performed well. NWCPC has been successful in collecting revenues through its monthly meter reading and billing; about 91 percent of potential revenue was collected in 1990.

Source: DANIDA (1991).

Box 4.4. Pakistan: community-based rural water systems

Community-based water supply schemes are common in Azad Jammu and Kashmir (AJK) state, which has a population of over two million people.[a] These schemes are identified and initiated by communities and developed on a self-help basis with cost-sharing support from the Local Government Rural Development Department (LGRDD). Guided by local leaders and elites, communities make technology and service-level choices, and plan and design the systems with limited technical guidance from LGRDD. The AJK experience demonstrates both cost effectiveness and sustainability. It serves as a model for large scale replication. A recent World Bank loan of $28 million will extend the community-based approach to an additional 1,000 villages.

Bangrila village in Mirpur district (Azad Jammu and Kashmir) is an example of how a community-based, piped-water system works. Bangrila has a population of nearly 5,000, dispersed along the slopes of a hilly terrain. In 1981, in response to a desperate need for potable water, the local community decided to develop its own water supply system. The villagers formed a water committee on their own and then approached the LGRDD through the Union and District Council of the area. The community agreed to share 50 percent of the capital cost of the project and the entire cost of operation and maintenance. The water committee raised the required funds from contributions made by residents and relatives living overseas. The project was executed as a joint venture of the community and the local government department. Total project cost was Rs 830,000.[b] The hardware component of the scheme consists of a turbine pump with a 30-horsepower electric motor and 15,400 running meters of pipe.

Nearly 250 households have water connections. The security fee for connection is Rs 300, with a monthly fee of Rs 35 per household. The total monthly contribution amounts to Rs 8,500, which covers the electricity charges and salaries of one operator and one valveman. The chairman of the water committee maintains an account register which shows the monthly contribution of each household and expenses incurred. The register can be examined by any member of the community upon request.

The scheme has been working without any major breakdowns for the last ten years. It was also successfully expanded during this period. Initially the community built one water tank with a capacity of 10,000 gallons; over time, the community gradually extended the scheme, which now has five water tanks.

a. This project was not included in the 121 cases studied.
b. Rs 35 = $1.00 in 1994.
Source: M. Khan (1992); Minatullah (1993).

for communities to take an active role in the system are few in such an environment.[25]

Uganda: decentralizing maintenance. The struggles of the government of Uganda over the last thirty years illustrate the difficulties of achieving effective government-managed maintenance systems without fiscal and asset decentralization to the district level. Shortly after the country's independence in 1962, the government began implementing its plan to provide safe water and other social services to the entire population. Water-system implementation and maintenance was highly centralized under the control of the government's Water Development Department (WDD). Throughout the next decade, however, escalating internal instability wreaked havoc on the water systems. About 80 percent of all pumps were working in the 1960s; by the 1970s most were in disrepair. According to government statistics, by 1980 approximately 95 percent of the rural population had no access to safe water supplies.

Results of a community survey conducted by UNICEF and the government in the early 1980s showed that communities were dissatisfied with government repair services, and wanted to own the pumps and be trained and equipped to repair them. UNICEF replaced old pumps with new, standardized ones, and provided standardized training and tools. The central government, however, would not turn over ownership of the pumps to the communities. In the years after the introduction of the new pumps, the central government's maintenance program continued to run into bottlenecks. The government's response time for repairs often exceeded six months, and more than 50 percent of pumps were not in service at any given time.

These problems continued until 1986, when a coalition government was formed. Given the new government's focus on socialism and self-reliance, UNICEF again recommended a community-based maintenance system for handpumps. This time the government responded positively and project planning with communities began in the Luwero district in April 1986. Box 4.5 highlights the process used in developing the decentralized systems and the continuing problems in applying the approach nationally.

Côte d'Ivoire: maintenance problems continue. The experiences of the World Bank Second Rural Water Supply Project in Côte d'Ivoire point to the fact that, even when trained technicians are available and spare parts are distributed, functioning water systems will not be achieved without community interest, commitment, and involvement in decisionmaking. A survey in 1988 disclosed that, after the government had spent $115 million to construct 13,000 water points, only 52 percent of the handpumps were functioning. This finding resulted in the introduction of a new program financed by the World Bank, called "Programme de Restructuration de l'Hydraulique Villageoise." The objective of the program was to give full O&M responsibility to villagers, supported by a privatized system of repair technicians and nationwide distribution system of pump repair parts. Nationwide, approximately 460 repairmen were identified and trained, a ratio of 1 repairman to about 30 pumps. Spare parts were made available nationwide through an automobile parts distributor.

Sensitization meetings were held in all villages, and 94 percent of the village groups agreed to create water committees and accounts and to prepare pump sites before the government rehabilitated the pump free of charge. When the program began, however, 83 percent of the villages did not prepare the pump site, 31 percent did not create a village account, and 45 percent of the village committees were not operational. Government technicians rehabilitated most of the pumps nonetheless.

One year later, according to a survey conducted in late 1992, over 30 percent of the pumps were again out of order, and half of the village

Box 4.5. Uganda: decentralizing maintenance

The community-based system of handpump maintenance evolved through extensive discussions with communities and administrators at each level in the Luwero district of Uganda. Community "mobilizers," provided by the Luwero district administration, central government, and UNICEF, explained the project to communities during local religious services and community meetings. Each community was then asked to appoint eleven members, plus its nine Resistance Committee (RC) members, to represent it at a series of meetings on the project. (The Resistance Committee system, which exists from the village to the national level, was created by the new government to decentralize social services.) Representatives met to discuss the project with government and UNICEF officials. Over 100 such meetings were held before the project began.

Through these discussions, project implementers learned from the communities how best to develop a community-based maintenance system for the handpumps. The meetings also enabled the communities to participate fully in decisions about pump location and installation, maintenance and management systems, and methods for raising funds to cover maintenance and management. Community representatives reported findings from the meetings to their communities and gathered additional suggestions for future meetings.

Representatives were then chosen for a subcounty-level committee, from which five members were sent to a five-day workshop at the district level to finalize the system. Representatives from UNICEF, the central government, NGOs, and the district administration also attended. After the system was finalized, guidelines were written to help communities set up their maintenance systems. This process approach allowed maximum flexibility for the community, while still satisfying the subcounty and district levels by standardizing the system as much as possible.

The strategy for the system included the following steps: each community selected a pump caretaker, who was trained in preventive maintenance by the Water Development Department (WDD) staff and given necessary tools; every group of twenty communities selected two pump mechanics for training in major repairs and maintenance, and each of those mechanics were given tools and a bicycle; each community decided how it would pay pump mechanics and maintenance people; each subcounty RC was given a one-year supply of spare parts; and sales depots were established to sell spare parts provided by WDD at the district level.

The system was monitored closely by the government and participating communities and refined over the first two years. Over the eighteen months of the project cycle and for two years afterward, 98 percent of all pumps were working at any given time, and the time between breakdown and repair did not exceed two days, with most repairs made the same day of breakdown.

Difficulties remain in trying to apply this decentralized system throughout the country. The system depends heavily on the district level, yet district-level capacity is very limited after special "project units" are removed. In addition, although the central government has focused on giving districts the administrative, financial, and decisionmaking responsibilities for water systems, it is still reluctant to provide districts with the assets and personnel necessary to fulfill these responsibilities.

Source: CIDA/SIDA (1993).

water committees were not functioning, 20 percent of which had already disbanded entirely. This unfortunate outcome occurred despite the availability of well-trained and motivated repair technicians and of spare parts.[26] Interestingly, though, some villages achieved great success: committees were functioning well in areas where the community organization was already strong and there was a strong felt need for an improved water supply; committees thrived also where communities sold water and managed profits themselves (Hino 1993). The program's commitment to monitoring its own performance and to refining its approach to correct for problems is now leading to a clearer demand orientation and focus on beneficiary participation.

Establishing a Participatory Process

The study findings establish that beneficiary participation in decisionmaking is an iterative process without clearly marked stages (except for analytical purposes). Hence it is important that beneficiaries be involved in decisionmaking at all stages of a project cycle, and not just carry out certain mechanical tasks, such as gathering local materials, laying the pipes, and hosting outsiders. Beneficiary participation in decisionmaking was the single most important contributor to overall quality of implementation.

Project experiences establish that, when given opportunities, communities can take the lead in design, redesign, construction, and maintenance. A few projects involved beneficiaries directly in subproject design. Direct involvement of beneficiaries in determining the overall project design was rare; reliance on indirect participation through surveys and other consultation techniques was heavy, however. The projects in the study employed different approaches to community roles in construction. The level of beneficiary participation in construction was high for 41 percent of projects, medium for 29 percent, and low for 30 percent.

Two projects in Ecuador, one funded by USAID and implemented by Catholic Relief Services (CRS) and the other funded by CARE/Canada and implemented by CARE and various governmental agencies, are examples of the positive effects of local control in the construction phase of a project.

In the CARE project, water committees coordinated construction activities for the community, which contributed a substantial amount of labor to the project. Using local authority to organize construction also drew successfully on the local highland tradition of communal work groups, or *mingas,* used by the indigenous population to solve a variety of infrastructure problems.

The CRS project also relied on local water committees (juntas) to organize community members for construction, as well as to resolve logistical problems which arose during the construction phase. CRS went even further, however, in giving control to the local community. The estimated capital cost of each subproject was allocated to the community junta, which could then purchase materials and equipment and hire skilled labor, as necessary.

Both of these projects achieved good operation and maintenance of facilities. The CRS project had especially positive results, with communities initiating a number of new community projects. It is important to note, however, that beneficiary control of construction was only one part of a whole strategy of participation.

The CARE/Rwanda Byumba Southeast Water Systems Project is another example of how beneficiary participation in construction, as part of an ongoing process, can positively affect operation and maintenance. The CARE project staff had extensive dialogues with the community before construction began—which had not happened with previous projects in the area—and community members themselves worked to construct the water system. After construction was completed, community members expressed a strong sense of ownership and responsibility for the water systems. Users have since carefully maintained the premises and have protected the installations from vandalism, in marked contrast to their treatment of previous water systems constructed by outsiders.

In a demand-based approach, which treats participation as a process and community people as the clients, the most important issue in construction is not contribution of labor and materials, or even involvement in all the construction decisionmaking; it is, instead, shifting accountability for construction from outside agents to internal community groups. In this process the community decides how it will participate. It

may decide to contract with an agent for all of the construction work, with the community paying for all the services or signing off on government-provided assistance. Or it may decide something else. The point is that community accountability yields positive results.

It is easy to subvert any process. Experience shows that ensuring accountability for quality construction requires the community at large to assume a watchdog function. If it does not, the benefits are captured very quickly by local elites, who are in a natural alliance with the outsiders. The Orangi Pilot Project in Pakistan is the most dramatic documented case of the benefits of local accountability: system costs dropped to one-tenth of their earlier level, largely due to reduction in rents and leakages, when accountability shifted from distant agents to the community.

While participation of beneficiaries in operation and maintenance is important, project experiences show also that injecting participation for O&M without any earlier consultation does not work. The "handing over" syndrome characterizes this staged approach to participation: typically, a public works agency constructs a system without conferring with community members; then, just before leaving, the agency informs the community that it is responsible for operation and maintenance. Communities, unless they are in extremely dire straits, have no interest in making the effort to take care of a system they did not ask for and do not own. Experience of project after project confirms this conclusion.

Policy Lessons

Beneficiary participation is a key contributor to achieving project effectiveness and maintaining water systems in good condition, as well as to enhancing local management capacity and empowerment. Beneficiary participation in decisionmaking by definition implies that a community will share in or control major decisions at the subproject level. Obviously, this cannot happen if agencies continue to control all of those decisions; beneficiary participation therefore presupposes major institutional reform to shift control from agencies to communities.

Beneficiary participation by itself, however, in the absence of support and linkages to the world outside the village community, will not result in effective projects. Availability of spare parts and repair technicians and use of the right technology are particularly important. If promised inputs, training, or supplies are not delivered, beneficiary participation cannot transcend their absence. Project designers also need to pay attention to the complexity of the system, including technical complexity and number of users and different activities and organizations to be coordinated. The greater the complexity, the greater the likelihood of failure. Given the high rate of unsuccessful rural water supply projects, project design should focus on delivering water first and sanitation later.

Direct, intensive involvement of large numbers of beneficiaries is not important in influencing overall project design, but consultative processes (defined as low levels of participation) and broad stakeholder involvement may be critical to project design. Moreover, although it may not be important for beneficiaries to be directly involved in project design, it is important that project design be such that it enables beneficiary participation during implementation, once a project has been formulated and financed.

All projects are made up of subprojects, whether they are conceptualized that way or not. Involvement of beneficiaries in the implementation of these location-specific water systems is important at every stage, from planning the system through site selection, resource mobilization, social organization, construction, and operation and maintenance.

One of the characteristics of participation is that it cannot be turned on and off like a tap, that is, "now you participate, now you don't." Participation is an evolutionary process that gathers momentum and defies breakdown into neat, self-contained categories, except for analytical purposes. Attempts to establish that participation is particularly important in any particular stage, especially in the later stages of operation and maintenance, are not only misguided but have contributed to ineffective projects.

Participation should be viewed as a process that starts with planning and ends with operation and maintenance, rather than as an element that can be injected in the later stages of a project whenever outsiders determine. Effective participation takes many forms—there is no one ideal form.

CHAPTER 5

Factors Affecting Beneficiary Participation

The preceding chapter demonstrated that greater participation is strongly associated with enhanced project performance. Creating greater levels of beneficiary participation in projects is therefore an important goal, but participation cannot simply be mandated. It is the result of decisionmaking rules that affect the incentives and interactions among beneficiaries, within agencies, and between beneficiaries and agencies. Two questions are particularly important to answer:

- Which elements of the participatory process are critical to producing beneficiary participation?
- What are the project, beneficiary, and agency characteristics that influence both these elements and overall participation?

This chapter examines the statistical and case-specific material on the factors that determine the level of participation. Three of those factors were found to strongly influence the participation of beneficiaries in projects:

- Demand for the services the project delivers
- Organization of beneficiaries
- Autonomy and client-orientation of the implementing agency.

Part of this chapter is a review of the evidence on the degree of participation elicited in the projects; this section examines the relationship between overall beneficiary participation and specific elements of the participation process, such as agency responsiveness and beneficiary commitment. Another section looks at those characteristics of projects, agencies, and beneficiaries that are associated with greater benefits from participation (for both beneficiaries and agencies), and thus educe higher levels of participation.

Participation in decisionmaking evolves over time, with feedback loops; it is therefore a nonlinear process. For example, if the initial interaction between agencies and beneficiaries is positive, beneficiaries are more likely to attend subsequent meetings. If a series of such interactions are positive, then trust is established among the groups. Data from purely *ex post facto* evaluations cannot, of course, capture the full flavor and complexity of this evolutionary process, so this chapter weaves together narrative case material and statistics to present a more comprehensive explanation than could be achieved with the data alone.

Degree and Elements of Participation

The rhetoric far outstrips the practice of participation, as analysis of 121 projects shows. Seventy-nine percent of the projects were rated low or medium in overall beneficiary participation; only 21 percent received high ratings. The situation was worse for women's participation: 83 percent of all projects had low or medium

ratings in this category. Even nongovernmental organizations, often assumed to be participatory by definition, are not necessarily so. A recent in-depth study of thirty NGOs in Latin America found that a majority of them scored low or medium on participation (Carroll 1992). Given the apparent difficulties in achieving high levels of participation—and given participation's critical importance in achieving project effectiveness—it is important to identify the determinants of participation.

The difficulty in modeling participation (figure 5.1) is that several events are happening simultaneously; causality is not easily disentangled. For example, achieving local control and ownership is not an all-or-nothing phenomenon. Because it changes over time and interacts with participation, it could be considered either a subset of participation or an intermediate outcome, which affects participation. Nonetheless, those who want to induce participation need to know which key intermediate steps (or elements) indicate a healthy process of participation, without implying causality.

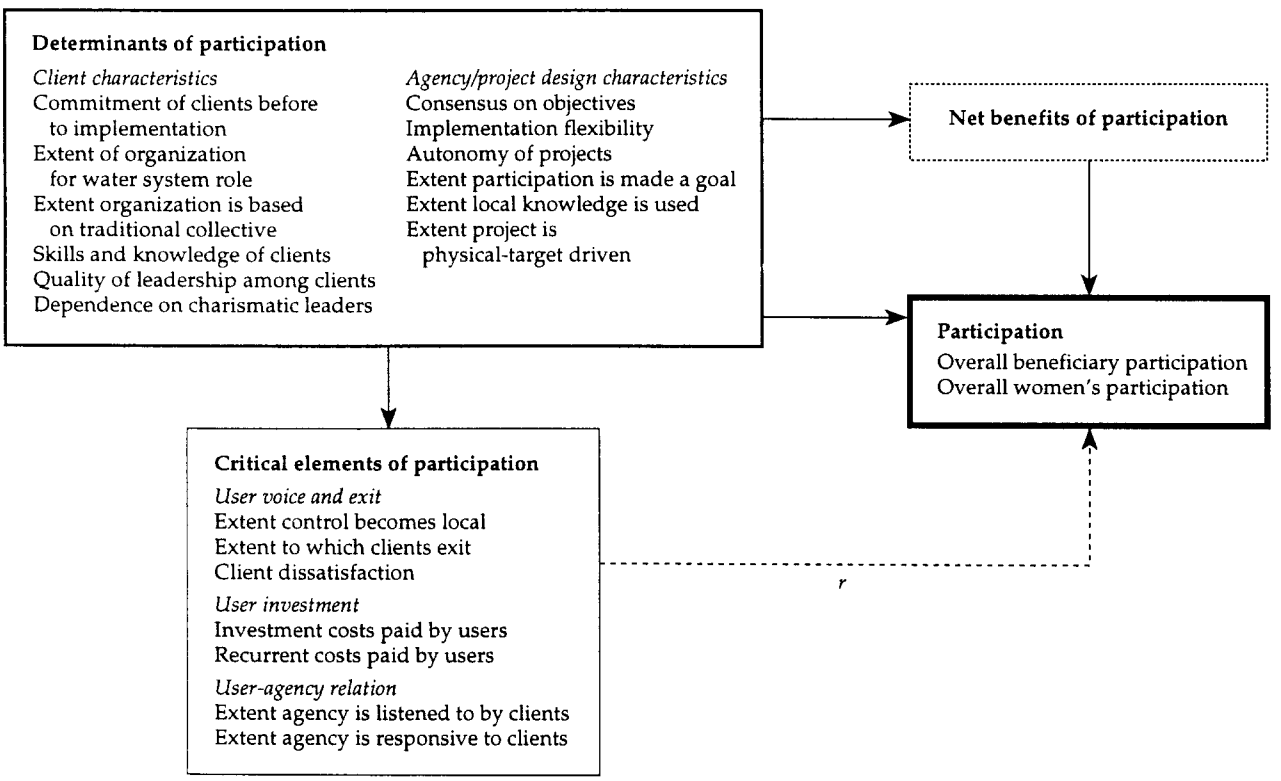
The relationship (correlation) between intermediate elements of participation and overall participation is presented in table 5.1. All of the variables are strongly associated with participation, but the three factors that stand out are the *investment cost to users,* the *extent control becomes local,* and the *responsiveness of the agency.*

User Investment in the System

Willingness-to-pay studies are an important means of assessing demand, and their results are used in designing projects. What people in individual communities actually pay for up-front capital costs or operation and maintenance can be judged only when implementation begins, however. The commitment to "put your money where your mouth is" on the part of users marks an important intermediate step to achieving overall participation.

Two indicators of user costs were measured, the percentage of capital costs and the percentage of recurrent costs paid by users for water systems. The correlation between user-paid capital costs

Figure 5.1. Model of relationships between beneficiary participation and its determinants



Note: r = correlation, it does not imply a causal relationship.

and overall participation was significant ($r = 0.75$). The percentage of recurrent costs was less strongly, but still significantly, related to overall participation ($r = 0.58$). The aphorism "you get what you pay for" has its own corollary, since paying apparently empowers users to go out and get what they bargained for.

Extent of Local Control

When outsiders induce collective action, participation can be facilitated to the extent that control and ownership of rules, regulations, and property becomes local. An inhibiting factor is the degree to which collective action is controlled and commanded by the external agency (Bromley and Cernea 1989; McCommon, Warner, and Yohalem 1990; and Donnelly-Roark, 1987). People are more likely to undertake collective action when it directly increases their access to natural resources.

The study asked three questions to address the issue of control and autonomy of the water-system organization to ensure that slight semantic differences did not produce false results in the quantification process:

- To what extent did control and ownership become local, that is, to what degree did decisionmaking and financial responsibility reside in the community rather than in the external agency?
- To what extent was the local O&M organization autonomous?
- What degree of community/agency sharing existed in management and decisionmaking?

The three measures correlated highly with one another, at about 0.88; therefore only one item—degree of local control—was included in the model.

The degree of local control and ownership was significantly correlated to overall participation ($r = 0.79$). Generally, then, it would appear difficult to achieve high levels of participation without local control over decisionmaking. The experience of the Rwanda Second Water Supply Project demonstrates the point (see box 5.1).

The other measurable variable related to the extent of local control is the extent to which clients simply choose to exit the project rather than to participate. And exit they do, when they are dissatisfied with the water system, and hence they cannot participate in decisionmaking. The study showed a significant negative correlation between overall participation and dissatisfaction with and exit from the system.

Table 5.1. Correlations of elements of participation with overall beneficiary participation

Intermediate element	*Correlation*
Investment cost to users	0.75[d] (n=113)
Recurrent costs to users	0.58[d] (n=103)
Extent control becomes local	0.79[d] (n=121)
Client dissatisfaction	–0.50[d] (n=111)
Client exit from system	–0.50[c] (n=99)
Agency responsiveness	0.80[d] (n=113)
Extent field agents listened to clients	0.72[d] (n=94)

Note: Reported are the partial correlations and t-statistics (in parentheses) on OBP from three linear regressions, with OPE as the dependent variable, including different sets of independent variables: (1) OBP alone (bivariate), (2) OBP plus seven direct determinants, and (3) OBP plus seven direct and eleven direct/indirect determinants.

Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001. The number of projects analyzed are in parentheses.

Agency and User Relations

The interface between the agency and users is of critical importance when collective action is induced by outsiders. It determines whether there is a fit between user demand and agency supply, which in turn helps determine project effectiveness. Realizing the importance of the interface, many centralized agencies employ a variety of intermediaries, which are better suited than are they for working directly at the community level.

But the interface cannot be one-sided. Agencies have to be responsive to clients, and clients have to want to listen to agencies. Two factors were included in the model to capture the interdependent nature of the relationship: *agency responsiveness to clients* and *client responsiveness to agency field staff*. The correlation between overall participation and agency responsiveness was highly significant ($r = 0.80$); the correlation between participation and the extent to which users listen to field agents was also significant ($r = 0.72$).

The three characteristics just discussed describe important elements of participatory projects. Beneficiary participation is nearly

Box 5.1. Rwanda: government control over community decisionmaking, or a losing proposition?

The experience of the Rwanda Second Water Supply Project highlights the importance of local control in decisionmaking and the difficulties in achieving it. A recent study of the project (completed in March 1993) showed that only 44 of the 144 communities covered by the project had functioning Community Water Associations (CWAs), the organizations responsible for managing and maintaining water systems.

The project was implemented by central government ministry staff, who carried out all the activities associated with community-based systems. They conducted baseline studies and surveys, developed educational materials, trained communal extension agents and other assistants, conducted meetings and elections, created Community Water Associations (CWAs), implemented user education and construction, and monitored systems. They did not, however, give up decisionmaking control.

All major decisions concerning project components were made by the World Bank, central government ministries, and other donors. Communities could not choose whether they would receive improved services; what service level they would receive; or how they might maintain their water system. Management decisions were made by the communities after construction, but within the framework established by the government.

Local management was integral to the government's strategy, yet there was no local control in the design or decisionmaking process. The guidelines and plan of action for project implementation, including dates of village visits, were developed far in advance, without community input. Committees were established despite the fact that the committee structure had been tried and had failed in earlier projects. The CWAs took a lot of work and time to establish, yet representatives received no pay and, in some cases, no supervision, support, or training.

Incentives for local government officials and committee members to cooperate were low. It was often difficult to convince the mayor and communal authorities to adopt national policies and undertake the plan of action for the establishment of user groups and associations. Communal authorities did not accept the principle that users should pay, or that they should be required to pay in advance. Local government officials did not want outsiders to interfere in communal mobilization; nor did they respect elected committee members.

In addition, the project structure was complex, with seven different funders often disagreeing over project components. Reaching consensus on an approach to community management took more time, under difficult communication conditions.

Source: World Bank (1993).

always associated with users paying part of the investment costs, with control of the project becoming local, and with an agency that is responsive to client needs. But although these characteristics (user investment, local control, and client-responsive agencies) describe elements of the participation process, they do not cause participation. The next section goes one step further. It addresses those characteristics of projects, agencies, and beneficiaries that are associated with these participatory elements and with particular participation outcomes. In other words, it looks for the determinants of participation.

Determinants of Participation

Participation is not without costs. It requires the time and skills of beneficiaries, agency representatives, and project employees. From the agency point of view, participation increases uncertainty in project design, and it often delays physical implementation. From the client viewpoint, in addition to time, costs include not only time but outlays in cash and perhaps even social costs, such as altered conflict and changes in leadership However, as experience proves and statistics show, participation occurs because it brings benefits to clients.

Since participation is the result of decisions by individuals (members of communities, local leaders, agency employees, and government officials, for example), it is more likely to occur when the net benefits to the involved parties are perceived to be high. As a matter of arithmetic, the net benefits to potential beneficiaries of water projects are high when either the benefits are high or the costs are low. For agencies the perceived net benefits of participation depend on the internal structure and incentives of the agency, and especially on how the agency views its objectives.

The net benefits of participation to agencies and clients were assessed for each project when the evaluation reports were coded. Net benefits were strongly associated (0.78 correlation) with the observed level of participation. Indeed, it

would be unsurprising to find a perfect correlation if net benefits could be perfectly observed; but for *ex post* evaluations to identify not only the degree of participation but also the net benefits suggests that those benefits are associated with observable characteristics of any given project, including some within the influence of policy.

Net benefits of participation should be a function of all the user and agency determinants of participation; to test that conclusion, a multivariate regression of net benefits was conducted on the determinants of participation. Strikingly, only two factors, one relating to beneficiaries and one to agencies, emerged as significant determinants of overall net benefits of participation. These factors were *demand or prior commitment of clients* and the *extent to which beneficiary participation was an agency goal that was monitored and evaluated* and for which agency staff were rewarded.

Beneficiary participation can be elicited in a wide variety of political, economic, and social contexts, then, so long as incentives exist at both the agency and the community levels, and agencies send strong signals to staff about the importance of generating and supporting beneficiary participation in decisionmaking.

The findings on net benefits and important elements of the participatory process suggest that three classes of factors will be important influencers of the level of participation. The *strength of demand* for the project (that is, the perceived benefits by potential clients) will determine the benefits of participation. Intensity of demand will be determined by such factors as alternative sources of water and the cost and type of proposed water improvements. The close relationship between demand and participation is evidenced by the strong association between participation and user payments, which at least to some degree must reflect underlying demand.

The second set of factors that determine participation concern the *beneficiary capacity for organization,* which influences the costs to a community of organizing for effective participation. The existing strength of organization and leadership, the skill and knowledge of clients, the degree of consensus on objectives, and other local factors determine whether, for a given level of potential benefits from participation, the community will mobilize. Control can become local only to the extent that clients can and do mobilize to take control.

The third set of factors that determine participation is the *client-orientation of the agency,* including whether the agency has sufficient autonomy to incorporate participation as well as whether agency goals are determined by client satisfaction or by some other, physical indicator, such as production targets. The responsiveness of the agency, a crucial element of participation, depends heavily on the extent to which the agency has incentives to meet client needs.

The following sections explore the interconnections among demand, capacity, and client-orientation by first presenting the evidence from cases and case studies and then by examining the empirical links uncovered in the sample of 121 projects between overall participation and its several aspects, its net benefits, and the variables hypothesized to affect it.

Demand

Felt need is an important determinant of community action, which has long been recognized, yet agencies have not systematically accepted felt need or demand as a key criterion for selecting communities for water projects. Projects varied widely in their methods of assessing demand, the degree to which they used demand as the key selection criterion, and the degree to which they linked demand to service levels. The study found three issues concerning demand to be important: (1) the method of assessing demand, (2) the extent to which projects maintain a commitment to using demand as the primary selection criterion, and (3) the differentiation of demand by service levels.

Assessing demand. Willingness to pay for services is a strong indicator of demand, which has been shown to be critical in creating sustainable water systems (Briscoe and de Ferranti 1988). Many agencies committed to serving the poor have been reluctant to adopt "willingness to pay" as the sole criterion for establishing water projects; they have instead used poverty to screen communities for eligibility. Yet evidence from around the world has shown that the poor are already paying for water, sometimes more than the rich (Whittington, Lauria, and Xinming 1989),

and that the poor are willing to pay if reliability of services is assured (Altaf and others 1992).

Demand changes over time, so demand assessment itself cannot be static. Projects gauged demand during implementation by getting communities to demonstrate their interest and commitment *before* project construction began. For example, participants displayed commitment when they contributed local materials, signed agreements, put up a certain amount of cash, held village meetings, and reached group consensus on whether and under what conditions they would participate in a project and on how to proceed.

Most of the projects, however, simply assumed that demand was high in water-scarce areas, as judged by objective criteria such as long distances to sources, nonavailability of safe water, or high levels of morbidity, all of which came from statistics in secondary sources. Such calculations allow some assumptions, of course, but experience shows that when *all* project planning is based on such rough, nonuser measures, failure rates are high.

In fact, in many of the study projects that scored low in effectiveness, agencies had defined criteria of need based on poverty, health statistics, and water scarcity in agency-selected communities. For a project in Indonesia, for example, government agency staff had done painstaking survey work in villages to establish the severity of water problems, based on objective criteria such as population size and distance to and quality of water. Four villages judged to be the "most needy"—those with the most severe water problems—were selected to be served first. In order to develop project strategies within the selected villages, the executing agency, an NGO, began to collect data to assess village needs, including the perceived need for water improvements. Less than 20 percent of the populations reported water to be a high-priority problem. Furthermore, one village with, reportedly, three water sources turned out to have seventeen, most of which were small springs not considered important enough for large-scale development. Since the motivation for change is not bacteriologically clean water so much as convenience and water quantity, the incentive to participate in collective action in such a situation is weak. Indeed, all water sources in the Indonesian village, large and small, were not public property at all; instead, they had well-known "ancestral owners" and therefore well-established rules regarding access and use (Narayan-Parker 1986).

Demand focus in community selection. Despite espousing participation and demand as important criteria, staff in most projects did not cease efforts in those instances when communities were clearly indifferent to what the project had to offer. In general, government agencies were more reluctant to walk away than NGOs.

The proclivity to proceed even in the absence of community interest is well illustrated in a World Bank project in the Mwanza region of Tanzania, which had as a prime objective "full participation of villages in all project activities." Once the project began, demand for the wells turned out to be low; no requests had been received from villagers twelve months into the life of the project. Nevertheless, the detailed yearly targets for well construction drove the project; construction crews eventually did everything themselves so that implementation of the project would not be "handicapped" (Therkildsen 1988). Echoes of this story are heard all over the world. A recently completed review of a Nigerian government project revealed similar happenings (Boerma 1993).

An important innovation—a system of application forms—is now being used to sidestep political pressure and to help ensure a demand orientation. Procedures require communities to request and fill out application forms and to meet certain conditions before the external agency will commit itself to a partnership with the community. This system has been tried effectively in several projects in Indonesia, Paraguay, and Swaziland (see box 5.2), and it is being employed increasingly for World Bank projects (see chapter 6).

Importance of matching demand with desired service levels. Even giving more than lip service to assessing demand for water is not enough, however. It has also proven critical to provide the level of service people demand. Several examples, especially the striking evaluation of USAID assistance in Thailand, dramatically establish the importance of providing appropriate service levels (Dworkin and Pillsbury 1980). The Thailand experience revealed

that over twenty years, as the service moved from handpumps to motor pumps to house connections, communities that had been apathetic, uninterested, and unwilling to foot the bill for low service levels became willing to pay higher amounts for house connections. High levels of service reliability also were finally achieved.[27]

If the service level does not match what people want, not even the best-trained agencies can induce participation. For instance, the Girl Guides Association of Thailand, with assistance from the World Health Organization and the United Nations Development Programme, undertook a water and sanitation project aimed at supporting participatory decisionmaking, especially that of women. Anthropologists from Mahidol University collected data both before and after project implementation from control and project villages. Community field workers were trained and placed in the villages; the Girl Guides project team visited the villages, as needed, to provide organizational and technical assistance. The review conducted after the project had been completed found that the low level of service (improvement of traditional wells) did not generate much enthusiasm and that, despite intense facilitation and training efforts, women's involvement in decisionmaking remained low (Tunyavitch and others 1987).

Statistical evidence on demand and participation. The strong links between the share of investment and recurrent costs borne by the users and the degree of participation have already been established. This in itself implies that client

Box 5.2 Indonesia: evolution of a demand-led strategy

CARE's strategy of implementing water supply and sanitation projects in four provinces in Indonesia has changed dramatically since the start of work in the country in the mid-1970s. Initially CARE controlled and managed all stages of the projects. Over time, however, it became apparent that unless communities took control of, and responsibility for, financing and managing water systems, sustainability would not be achieved. Subsequent projects, including the current Community Self-Financing of Water and Sanitation project, focused on community demand as the key selection criterion, with control shifted to communities.

An important indicator of the success of the new approach is the shift in the source of cash contributions over an eleven-year period, 1979–90. In 1979 the combined contributions of CARE and the Indonesian government constituted approximately 80 percent of project costs. By 1990 combined CARE and government contributions had dropped to about 30 percent; community contributions had risen to cover over 70 percent of the costs. Communities had provided all cash contributions for physical construction for more than three-fourths of the projects. Most communities managed to successfully operate and maintain their systems (some for as long as the period covered by the project review, or up to ten years). In addition, many CARE-assisted communities have helped neighboring communities to develop their own systems.

A six-stage implementation strategy, summarized below, is responsible for the focus on demand and capacity building.

1. *Community selection:* Government and CARE jointly select potential districts, market the project, and contact local leaders. Communities apply for a project, and through surveys CARE assesses their willingness and ability to pay. Meetings are held with selected communities to explain and discuss the conditions of the project.

2. *Committee formation and negotiation:* The community selects a water committee at a meeting. The newly selected committee then negotiates its responsibilities with the government and CARE.

3. *Planning:* The water committee chooses a technology from those that CARE suggests as appropriate. It designs and prices systems and, with CARE assistance, develops resource mobilization and construction plans. These designs and plans are then presented to the community and a formal agreement between the community, government, and CARE is signed.

4. *Implementation:* CARE trains the water committee in bookkeeping and control systems and construction of facilities. Once control systems are in place, the committee begins to mobilize cash, human, and material resources. Costs are shared and cash contributions by members are graduated, according to ability to pay. Credit from pipe suppliers and local banks is a common method of mobilizing "outside" cash. Monitoring continues throughout this stage.

5. *Operation and maintenance:* The community selects an O&M committee, which draws up regulations and bylaws and presents them to the community. The O&M committee develops a budget, bookkeeping system, and training plan. CARE provides follow-up training.

6. *Evaluation and monitoring:* CARE continues to assist the O&M committee for approximately one year.

Source: Boase and others (1989); Jackson (1988); McGowan, Soewandi, and Aubel (1991).

demand, as evidenced by a willingness to share costs, is a determinant of beneficiary participation. The strength of the prior commitment of beneficiaries to the project also was explored through project data. Table 5.2 shows the links between demand, participation, user payments, and a variety of factors influencing participation.

The first column of table 5.2 shows the relationship between prior commitment and overall beneficiary participation (row 1), the net benefits of participation (row 2), the fraction of user investment (row 3), and the recurrent costs borne by users (row 4). The prior commitment of clients is significantly positively associated with each of these outcomes, even after applying multivariate controls for other influences (column 1).

Demand, or prior commitment made by beneficiaries, therefore determines overall participation. Demand also determines the investment beneficiaries made in capital costs and, to a lesser extent, investment in recurrent costs. It also influences the overall perceived net benefits of participation.

Beneficiary Capacity

Organization of beneficiaries is important in managing participation. Several factors affect success in organizing for collective action, including high stakes in a particular outcome; low transaction costs; and trust, loyalty, and reciprocity, from which follows elimination of free-rider problems. To manage a water supply collectively, there must be some organization for treating water as a common property good, with some degree of excludability and subtractability.

Despite the erosion of common property management regimes, rural societies generally offer more stability, social cohesion, and personal contact than do urban societies. Rural societies, however, are not necessarily homogeneous. Social divisions may be deep, although groups and social networks typically are marked by reciprocity, trust, and exchange of goods. Tapping into this social organization is critical for successful collective action.

Case analyses revealed three beneficiary characteristics that are especially important: *existing social organization and cohesion; client knowledge and skills;* and *leadership roles.*

Social organization. Every society has its own organization which influences interactions—namely, how resources are produced, allocated, and exchanged; how and with whom people interact (or do not interact); and where people live and what they learn. Acknowledged or unacknowledged, good or bad, effective or ineffective in the eyes of outsiders, the existing social organization is the framework within which projects are placed. When the social fabric of societies is ignored, projects will run into problems sooner or later; when the local social fabric is understood, strategies that are more or less congruous with the existing system can be developed (Cernea 1993).

The Small Rural Water Systems Project in Yemen, which serves approximately 70,000 people, illustrates how a project can be successfully implemented using a traditional organizational structure, with full cooperation from local leaders, *sheikhs,* and local development councils (see

Table 5.2. Relationships between demand and participation outcomes and elements

	Beneficiary capacity				
Participatory outcome	*Prior commitment of beneficiaries (demand)*	*Extent clients organized*	*Skills, knowledge of clients*	*Traditional collective*	*Leadership among clients*
Overall participation	0.19[b]	0.23[a]	0.12	0.10	–0.14
	(2.5)	(2.1)	(1.7)	(1.16)	(–1.3)
Net benefits of participation	0.23[a]	0.05	0.02	0.04	0.01
	(2.2)	(0.3)	(0.2)	(0.3)	(0.06)
Investment in capital costs	0.63[d]	0.28	0.01	0.04	–0.01
	(4.8)	(1.4)	(0.1)	(0.2)	(–0.4)
Investment in recurrent costs	0.37	0.37	0.19	–0.11	–0.11
	(1.9)	(1.4)	(1.2)	(–0.6)	(–0.4)

Note: Significance levels are indicated thus: a = significant at 0.05, b = significant at 0.01, c = significant at 0.001, and d = significant at 0 0001. Figures in parentheses are *t*-statistics.

box 5.3). The caveat here is that systems must be developed to keep local leaders accountable.

Given the need to work with groups of people, support agencies have often mandated the formation of village groups or water committees. Unfortunately, such committees have often degenerated into form without function. Committees have been created without any understanding of the preexisting social fabric, with standard rules imposed from the outside and with members who do not understand their functions or responsibilities and who receive no training to equip them for their tasks. It is not surprising, then, that numerous project evaluations found project-created committees to be nonfunctional, especially where such groups had no control or authority.

Projects that have proved to be effective, in contrast, have created small water-user groups or pump or tap committees, which have few members and generally consist of people who are well known to one another. These are federated upward into groups at the next higher organizational level. The system of committees in the Malawi Self-Help Piped-Water System provides one such example (see box 5.4).

Beneficiary organization can take many forms, some based on traditional organizational structures and others creating new organizations, perhaps to get around a problem inherent in the existing local organization. New organizations are particularly vulnerable to the "project mentality," however; if they are not provided capacity building support, they dwindle away.

An externally funded project in Belize, which required that participating villages form Village Water and Sanitation Committees, is instructive. Each community was run by a Village Council, but these had a history of factionalism and were extremely political. The Village Water and Sanitation Committees were designed specifically to circumvent the Village Council and thereby sidestep political infighting. Members of the committee were largely self-selected. The committee was responsible for representing the project in the community, resolving project-related problems and conflicts, maintaining the systems, and requesting technical assistance when needed. Unfortunately, the project did not provide sufficient capacity building support. After playing an important role in implementation, committees found themselves unable to fulfill their responsibilities or to help the community with new development tasks when the project ended; many committee members lost interest and stopped meeting.

Traditional collectives. When community groups are based on traditional organizations, there is an ongoing basis for cooperation, trust, reciprocity, and conflict resolution. The transaction costs of transferring these traditions to solving a new problem are much lower than they are when an artificially created group, with no shared history of working together, attempts the same thing. Nevertheless, what is critical to eliciting participation is whether forms of interaction and decisionmaking are based on local traditions, not whether the organization itself arises from an existing traditional group.

Functioning of groups. Highly participatory and effective projects were studied in depth to

Client orientation of agency						
Presence of strong leaders	*Use of local knowledge*	*Participation a goal*	*Autonomy of a project/ agency*	*Physical-target driven*	*Flexibility*	*Consensus on objectives*
0.2	0.2	0.2[a]	0.17	0.06	0.02	0.01
(0.4)	(2.5)	(1.9)	(1.8)	(0.9)	(0.2)	(0.06)
0.14	–0.02	0.44[b]	0.15	–0.15	0.12	0.11
(1.31)	(–0.2)	(2.9)	(1.2)	(–1.6)	(0.9)	(0.8)
0.09	0.19	–0.10	0.25	0.16	–0.05	–0.02
(0.8)	(1.4)	(–0.5)	(1.6)	(1.3)	(–0.3)	(–0.2)
0.15	–0.01	0.26	–0.3	0.3	–0.11	0.22
(0.9)	(–0.1)	(0.9)	(–1.6)	(2.0)	(–0.5)	(0.9)

understand the processes used to manage local organizations effectively. Some findings were common to all of the successful projects: local groups had a clear task orientation; projects worked through traditional leaders, including religious leaders, in addition to the formal village system; and, over time, leadership shifted to those most interested in the project outcome.

Although agency preconditions and the nature of the water resource imposed boundaries, groups evolved their own rules regarding membership, fee payment, graduated fee schedules, sanctions, and disposition of collected money. Those groups that started with standardized rules established in accord with project guidelines sooner or later changed to rules more acceptable to them. They also engaged in successful problem solving, as evidenced by the ability to solve physical problems (such as pump malfunctioning, borehole silting, pipeline breaks, and inadequate funds to buy diesel) and organizational problems (such as dealing with changing politics, resolving conflict, and enforcing rules).

In other ways, groups varied widely. For instance, some collected money monthly, and some collected money for repairs only when there was a breakdown. The same was true for written records. Successful groups in Kenya kept no written record of money collected, but everyone trusted the female treasurers, who brought all the money to the meetings when asked to do so. By contrast, communities in Azad Jammu Kashmir, Pakistan, made detailed written records available to visitors for inspection.

Whatever their form and composition, functioning groups were marked by clear allocation and acceptance of duties. Additionally, the rules and regulations regarding membership, dues, sanctions, and use of the facility were well known even if they were unwritten. As tasks were completed successfully, water committees became less active, unless they took on new development activities. This was particularly true when project technology required only simple maintenance.

Government interventions have resulted in the expectation that government will provide all services, a belief actively fostered by local politicians. It would be easy in this environment for agency assistance to breed further dependency rather than to create user groups that feel responsibility for their own water systems. Few agencies have the courage to walk away when it is clear

Box 5.3. Yemen: role of local leaders in community mobilization

In Yemen's 168 districts, or *nahiyas* (made up of clusters of villages), the *sheikh*, an inherited title, is the final authority and oversees all village activities. Local Cooperative Councils for Development (LCCDs) are also an important component of the local organizational structure. In almost all public work and development activities, LCCDs are responsible for identifying village needs, discussing the needs with villagers and the *sheikh*, and submitting proposals to appropriate government authorities. Once government approval has been received for a public works project, the LCCD collects money from villagers to pay their agreed-upon share. Each village is represented by one LCCD member, elected by the villagers for a six year term.

Working within this system, communities are able to participate actively in almost all phases of a given water-supply project. After villagers and the LCCDs request a "subproject" from the Rural Water Systems Department (RWSD) of the central government, the RWSD assigns the subproject to the project implementers. *Sheikhs* often play an important role in this process, lobbying the RWSD intensely on behalf of their communities.

Sheikhs also play an extremely important role in helping project staff conduct before implementation survey. *Sheikhs* assist the survey team in obtaining personal data and in reviewing the proposed pipeline routes to take into account long-standing differences among landowners, tribes, or villages.

LCCDs play a crucial role in facilitating community commitments to the projects, including being a party to financial agreements for projects. In cooperation with LCCDs, villagers pay roughly one-third of the total construction cost of a project. Villagers construct and manage the distribution system throughout the villages, including individual household connections. In addition, villagers often extend the overall system, with assistance from the LCCDs.

Thus far, in one $20 million, externally financed project, every community involved has participated and agreed, before implementation, to take responsibility for O&M. Communities assumed all costs for system operation and maintenance, and successfully carried out all repairs, minor and major, hiring private mechanics when necessary. Through working closely with villagers and implementing the project through the local organizational system, the project's Phase II output of 100 systems was reached two and one-half years ahead of schedule.

Source: Laredo, Dawson, and Hashem (1986).

that communities do not perceive improved water as the answer to their most pressing problem. But the story can be markedly different if communities do perceive the water system to be a key problem. Box 5.5 describes the evolutionary process that develops when communities are left to formulate their own rules and regulations and manage their own development, with limited external technical assistance.

Organization for operation and maintenance was addressed specifically in the study, since poor O&M has emerged as the major problematic issue in infrastructure projects. It is important to note that the form of organizational arrangements per se did not seem to have a significant bearing on outcome. What was apparent was that effectiveness decreased on government agencies assumed control and responsibility for O&M.

Possible organizational forms include operator/repair persons, with or without village water committees; democratic cooperatives; elite-led associations; local government units; private enterprise; and the agency itself. Thus in Azad Jammu Kashmir, O&M is successfully performed by a hired mechanic selected by the Village Water Committee (VWC), which is composed of elites. In Indonesia, in Nusa Tenggara Timur, a VWC that includes women and the poor seeks a mechanic from the private sector for repairs. In some regions repair work is still carried out by local government units. In India a government-supported, two-tier system of maintenance—unlike the three-tier system described in chapter 4—works well in some states.

Local knowledge and skills. The knowledge and skills of clients have two important implications for water-system projects. First, the rich information and knowledge systems that local people already possess (indigenous knowledge) will determine how those clients evaluate and use water systems. Second, local people's technical skills and knowledge regarding water and water technologies can be put to good use. The participatory process taps the indigenous knowledge and extensive information that only local people can supply about their environment.

Box 5.4. Malawi: water committees

The cornerstone of the rural piped-water program in Malawi is its well-organized structure of construction and maintenance committees. Nearly all of the committees are composed of ten elected members, with men dominating construction and maintenance and women usually the majority of tap committee members. Local leaders, village chiefs, and party officials are crucial to success, since they determine whether committee authority will be respected.

Construction committees

The main water committee is responsible for the overall management of the program; as well as for the setup of the initial work program and the mainline digging program.

Section committees, a part of only large projects, are elected from villages located along various sections of the pipe that extend from the mainline. They draw up and supervise the daily trench-digging program.

Branch committees are responsible for organizing labor on branch lines after digging and backfilling on the mainline and section lines are completed.

Village committees are responsible for selecting standpipe sites, supervising the village labor, and ensuring that village attendance is maintained at committee meetings.

Once construction is completed, the maintenance committee structure is introduced. Most communities ask the main water committee elected for construction to supervise maintenance as well.

Maintenance committees

The main water committee supervises repair teams, tap committees, and caretakers; raises funds through village headmen; checks pipelines; reports problems; submits requests for additional taps; organizes self help labor; and settles disputes between tap committees and repair teams.

Repair teams are a technical arm of the main water committee. They carry out basic repairs on broken pipes, and the chairman is responsible for the tools, equipment, and spare parts required for maintenance work.

Tap committees are responsible for operation, care, and maintenance of a single tap. They organize periodic cleaning of the tap site and soakaway pit and raise funds from users for replacing taps and for repairing the apron.

Village health committees, organized by field workers in the Ministry of Health, educate villagers and promote improved health practices.

Source: Warner and others (1988).

Project reports noted several beneficial outgrowths of local knowledge and skills: local people guided outside surveyors to unplotted water sources; they helped design pipe distribution so as to take into account land ownership and potential social conflict; they were knowledgeable about water purification methods, seasonal differences, rainfall patterns, underground water flow, and presence of underground rivers (confirmed by hydrological maps); and they had their own categories of "good" and "bad" water and water sources.

The skills of clients are important in influencing how quickly or how slowly people are equipped to participate. Clients in successful projects actively negotiated rules and conditions among themselves and with agencies (especially rules regarding entry, use, and exit), determining effective management of the common property. Technical know-how among clients also was important in fashioning successful projects.

Some projects incorporate training to support capacity building at both the community and agency levels, but most programs do not give training the careful attention it deserves because it is generally considered a low-status activity. Cost estimates range from 0.5 percent to 25 percent of program budgets. Recent World Bank projects in Asia, using a demand-based approach, allocate 15–20 percent of project costs to support capacity building, including training in participatory approaches.

Role of elites and leaders. The capture of benefits by the rich has been a troubling issue in the rural water sector, and much emphasis has been placed on creating water committees that include marginal groups such as women and the poor. Experience shows, however, that without the involvement and support of the well-to-do and the powerful, water committees may be unable to effect change. The issue, then, becomes one of tapping the energy, imagination, skills, and power of the rich to serve the poor.

But experience does not provide a simple formula for tapping those assets; it just shows that projects need to take account of the interests of all the major stakeholders in a community. Successful projects have evolved three strategies for incorporating those stakeholders, including elites: first, co-opt the rich; second, widely disseminate information about the project and about its stipulated conditions; and third, create small working groups in the hierarchy below the larger village-wide groups.

Box 5.5. Indonesia: the story of Mutis

The WAS (Wanita, Air dan Sanitasi) program in Indonesia over a period of two years assisted community groups in Timor to initiate and manage their own water systems with assistance from the technical government ministries. The growth of groups and their management and problem-solving skills can best be illustrated by focusing on one group.

When people in the village Silla heard of WAS in 1986, those in Cabang, a part of the village consisting of seventeen households, quickly formed a water-user group. They hoped that finally the little yellow marker placed on the road several years before would become a borehole. Pak Minggus, a WAS field worker from the Department of Community Development, told the group several times that they would not receive a borehole, they were undeterred.

Copying the other water groups that did receive government assistance, the group named itself Mutis, after the highest mountain in Timor. Every family contributed Rp 250/month and promised to increase that amount to Rp 500 once the water came. Yet, as Minggus had warned, no water came. The group finally negotiated water rights with a neighboring group in Kakaana, who agreed to share water from the borehole in return for Mutis's help with maintenance and repairs. By mid-1987, Mutis had collected stones, cement, sand, and Rp 35,000. Mutis members contributed cement and pipes to the other water group.

It was in 1987, during a second round of intensive data collection, that the group finally accepted that the drillers were not coming. They began to explore alternatives. By mid-1988 the group had built three water collection tanks, with some technical guidance from outsiders, although in 1985 they had laughed at the idea of drinking rainwater. They also commissioned a well-digger with a promise to pay Rp 100,000; the well was 10 meters deep by mid-1988. The group started holding meetings on the fifth of every month and tackled other problems. It set up an emergency food fund, and began building one household toilet per month. Eggplants, chiles, and other vegetables were flourishing in people's yards. A return visit in 1992 found the group still functioning.

Source: Narayan-Parker (1989).

Leaders and the rich are often easy to co-opt since their accustomed role is to be prominent in any project and to bring resources to the communities. If water problems affect these community members (and this is usually true), they too will have a direct stake in changing the water situation. Their stake in improved water is likely to be even higher than that of other beneficiaries, since their needs are greater: the rich own more livestock, need more water for other production activities, and use more water for domestic consumption.

Benefit capture is easy for the powerful since they usually have good access to information. Thus, in the Indonesian INPRES program, water sources regularly ended up near the homes of village leaders. Even when community participation is anticipated, as it was in the INPRES program, communities cannot be meaningfully involved, nor can they become effective watchdogs forcing public sector agencies to be accountable, if they are not informed about available resources and the rules and regulations regarding their use.

It follows that programs that incorporate the rich and disseminate information intensively and widely also stimulate transparency, accountability, and helping behavior. The open nature of participatory decisionmaking is important: few elites would wish to publicly abandon their role of magnanimity.

Leadership. Development literature is replete with references to the need for strong leaders to start a movement, especially among the poor. Yet leadership is not a quality that a program can immediately muster. It may be an important criterion for village selection, however, particularly if a project does not allow community self-selection. Fifteen years into the implementation of projects, CARE identified three factors that promoted the effectiveness and sustainability of water projects: leadership, community organization, and community financial investment in the water system (O'Brien 1992).

In the present study, a distinction was drawn between two levels of leadership, one being the presence of a strong leader who gets things started and the other being broader-based leadership qualities among the clients. Neither type of leadership turned out to be a critical determinant of participation in the presence of other factors, but, as reported later in this book, leadership strongly influenced the extent to which local control was established.

Conflict and factionalism. Leadership, traditional or "modern" (official), is important in initiating the community organization process. Under any particular leadership, however, communities are not homogenous wholes living in perfect harmony; rivalries, feuds, and factionalism can impede collective action. Follow-up visits to four villages in Indonesia, eight years after conclusion of a baseline study of project activities, found that water improvement activities had ground to a halt in the one village that had been divided by intense rivalry between the official village chief and other traditional leaders (Judd 1992). Another example comes from Panama. For a study of the Panamanian SANAA-CARE community program, an evaluation team conducted extensive interviews with community leaders and heads of the Patronato (the community committee). The team found considerable conflicts within the communities (often along lines of political allegiance), which hindered community solidarity and implementation of the water system and watershed conservation projects.

Statistical evidence on beneficiary capacity. As should be obvious from the above discussion, measuring these nuanced sociological distinctions is a herculean task. Nevertheless, several dimensions of beneficiary capacity and costs to beneficiaries for organizing for participation are reflected in the following measured variables:

- *Extent to which clients were organized* before the project began
- *Skills and knowledge of clients*
- *Extent to which traditional collectives were used*
- *Leadership of clients*
- *Presence of strong leaders.*

Table 5.3 examines through multivariate regression analysis the relationship between each of these independent variables and the variables being determined—namely, overall participation, net benefits of participation, the extent to which control became local, and the extent of client exit from and dissatisfaction with the water system. Findings include the following:

Table 5.3. Relationships between beneficiary capacity and participation outcomes and elements

	Beneficiary capacity				
Participatory outcome	*Extent clients organized*	*Skills, knowledge of clients*	*Traditional collective*	*Leadership among clients*	*Presence of strong leaders*
Overall participation	0.23[a]	0.12	0.10	–0.14	0.20
	(2.1)	(1.7)	(1.6)	(–1.3)	(0.4)
Net benefits participation	0.05	0.02	0.04	0.01	0.14
	(0.3)	(0.2)	(0.3)	(0.1)	(1.3)
Extent of local control	0.48[b]	0.48[c]	0.32[a]	–0.58	–0.04
	(2.6)	(4.2)	(2.2)	(–3.4)	(–0.3)
Client exit	0.20	0.06	–0.12	0.05	0.28
	(0.6)	(0.3)	(–0.4)	(0.2)	(1.4)
Client dissatisfaction	0.09	0.03	–0.25	0.17	0.13
	(0.4)	(0.3)	(–1.6)	(0.9)	(0.9)

Note: Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001. Figures in parentheses are *t*-statistics.

- Extent to which clients were organized was significantly associated with both participation and local control.
- Skills and knowledge of clients was only modestly significant (at the 10 percent significance level) for overall participation, but was strongly important for local control.
- Use of traditional collectives also had only a modest association with overall participation; the variable was more strongly related to the degree of local control.
- Leadership of clients was strongly associated with the degree of local control, but less so with overall participation.
- Presence of strong leaders was unimportant. This variable is not associated with either greater participation or greater local control, and in fact is *positively,* although not strongly, associated with client exit from the system.

To summarize, in spite of the difficulties of measuring the client characteristics that relate to the capacity for participation, certain factors (that is, the extent of prior organization, skill and knowledge of clients, the use of traditional collectives, and leadership qualities among clients) were found to bear a strong relationship to the extent to which control of projects became local and, to a lesser degree, to overall participation.

Client-Orientation of Agencies

Agencies must adopt strategies to respond to community needs and preferences and to support local capacity building. In the rural water sector, broadening objectives beyond construction to include sustainability, targeting the poor, empowerment, equity, and cost sharing means realigning inputs, rules, structures, and procedures. Accompanying new objectives, however, are new problems which have arisen out of lack of agreement on objectives, on needed changes, and on the consequent restructuring of sector policies and institutions.

Project experiences reveal five major project/agency strategies designed to realign structures, procedures, and incentives to build an agency environment that can support client demand, initiative, and capacity building:

- Agency autonomy
- Adaptive planning approaches
- Use of local knowledge
- Changed objectives
- Responsive implementation and intermediation.

Agency autonomy. It is easier for agencies to be responsive to communities and support local capacity building when they have the mandate, resources, and authority to carry out planned action independent of other agencies. One of the problems that has plagued the sector has been fragmentation of responsibilities within several different government agencies. For example, project hardware, expertise, and resources typically reside with the public works ministry, whereas the responsibility for community extension systems lies with the ministry of social welfare and department of community development, each with different work programs and lines of authority.

Demand	*Client orientation of agency*					
Prior commitment	*Use of local knowledge*	*Participation a goal*	*Autonomy of a project/ agency*	*Physical-target driven*	*Flexibility*	*Consensus on objectives*
0.19[b]	0.20	0.20[a]	0.17	0.06	0.02	0.01
(1.9)	(2.5)	(1.9)	(1.8)	(0.9)	(0.2)	(0.06)
0.23[a]	–0.01	0.44[b]	0.15	–0.15	0.12	0.11
(2.2)	(–0.1)	(2.9)	(1.2)	(–1.6)	(0.9)	(0.8)
0.18	0.10	0.20	0.38[b]	0.01	–0.15	–0.31[a]
(1.5)	(0.8)	(1.2)	(2.6)	(0.1)	(–1.0)	(2.0)
–0.17	0.22	–0.50	0.17	–0.31	–0.03	–0.37
(–0.8)	(1.0)	(–1.7)	(0.6)	(–1.5)	(–1.3)	(–1.3)
–0.26	0.10	(–0.30)	0.12	–0.17	–0.30[a]	–0.30
(–2.0)	(0.8)	(–1.6)	(0.7)	(–1.3)	(–2.1)	(–1.8)

The RUSAFIYA project in Nigeria illustrates what happens when a project lacks autonomy and when responsibilities are fragmented at different levels among government agencies (Boerma 1993). The project attempted to actively involve communities in all stages of implementation, and it met with success in some regions. In other regions, however, despite the dedication of staff, the project encountered a range of problems, which demonstrates how difficult it is to create the right incentives environment when responsibilities for implementing a participatory process are fragmented (see box 5.6). Stronger "project units" are not the answer; instead, one or two local agencies should be given the resources and authority to implement projects, with accountability induced through high visibility, external pressure, and incremental funding based on performance.

Autonomy in managing tariffs is particularly important. Local councils and divisions of public health engineering departments in various parts of Asia, Africa, and Latin America collect substantial revenues. Those revenues are turned over to general treasury accounts, however, which serves in the long run as a major disincentive to local collection.

Adaptive planning approaches. The blueprint, or masterplan, approach to planning projects assumes that everything is known, and hence can be planned, costed, and even procured in advance. Developing projects to match client demand, however, calls for a different planning approach. (The Tanzanian experience summarized in box 5.7 is illustrative.) What is needed instead is a demand-based approach, which responds to decisions made by hundreds of different communities—at their own pace, in their own time—after implementation begins.

In demand-led planning, management adopts a learning-process approach, has clear goals and objectives, expects and tolerates relatively high levels of uncertainty and ambiguity, plans for short time horizons, and operates with indicative costs and budgets rather than within detailed, inflexible budget lines. (See appendix 3 for a summary of differences between the blueprint and learning-process approaches).

Use of local knowledge. One of the important benefits of participation is the opportunity to take advantage of local knowledge and information about the local context. The more the decisions are made by local people themselves, the less the need for outsiders to be informed about every detail of community life and preferences. It is now quite common for projects to undertake sociocultural studies in preparation for rural water-supply projects, yet such studies are of little value if they do not yield information relevant to policy choices, or if the information is not used in management decisionmaking.

Sociologists and anthropologists both inside and outside the World Bank have long argued for the inclusion of local knowledge in the design and implementation of development projects (Cernea 1993; Salmen 1987, 1992; Warren 1991). The extent to which local knowledge is used is important to supporting beneficiary participation. Local

knowledge can be harnessed directly, by involving local people at different levels (especially in the planning and design stages); and indirectly, through data gathering on technical, social, cultural, political, organizational, and environmental issues in the local context. Beneficiary assessments and other, more traditional social science methods are common ways to indirectly gather data. Projects in the study sample used all of these methods. Box 5.8, which describes the evolution of water-user groups in Tunisia, highlights the importance of sociological knowledge in developing appropriate local organizations.

Changed objectives: participation and capacity building. Project experiences show that when agencies possessed commitment and a mandate, local participation and capacity building were achieved in a wide variety of cultural, political, environmental and technological contexts. This raises the broader issues of planning, priority, clarity, specificity, and consensus on objectives: if local participation and capacity building are associated with effective projects—and they are—then shouldn't they be project objectives? Project objectives of the twenty most effective projects are reviewed in appendix 1. The range of stated objectives for those projects was wide,

Box 5.6. Nigeria: difficulties in managing incentives

The RUSAFIYA project comprised five key actors: the community, the extension agents, the water and sanitation units (WASUs), the local government authorities (LGAs), and the project authorities. Many of the project's difficulties arose because these actors lacked, in large part, control over their participation in the projects, appropriate incentives, and accountability for their actions.

Lack of control. Rather than allowing communities control over their participation, project authorities often preselected communities for inclusion in the project. In some cases, communities that did not want to participate were persuaded or coerced into doing so by extension agents.

LGAs also had little control over their participation in the project and little input into project design; LGA staff therefore had very little stake in the project's outcome. When problems occurred, LGA staff blamed project authorities.

Project authorities, for their part, also encountered "control" problems in perceived conflicts over participation and deadlines. Decisions made by project authorities (for example, to await community commitment) were overshadowed by donor insistence on quick construction results. Donor insistence also succeeded in lowering the required community contribution from N 5,000 to N 1,800.

In Ningi, where the project met with more success, communities were allowed and encouraged to pay pump suppliers directly. In other regions, however, communities were expected to make payments to extension agents, which created considerable anxiety.

Lack of appropriate incentives. Since construction often proceeded regardless of whether communities paid their contribution, there was no real community investment in the system. Community interest was also affected by the fact that other government-funded projects were available to the community at no cost.

The project provided intensive training in participatory methods for the extension agents, but the pressure for quick implementation sometimes led extension agents to coerce uninterested communities to participate. This may have occurred because extension agents appeared to be judged on how quickly they could get communities to agree to participate and collect the necessary funds.

Finally, during implementation it became clear that the cooperation of the LGA chairmen was important for project success. However, the project presented few incentives to influence these officials to participate effectively. It was politically difficult for local government officials to actively support a project that helped communities become less reliant on the patronage of local government.

Lack of clear accountability. The lines of accountability that were put in practice proved to be complex and difficult to follow. WASU management decisions were overseen by both the LGA and the project authorities, but the WASU made financial reports only to the project authorities. Since LGAs, the higher level, lacked authority over project funds, they had little interest in the project and obviously could not be accountable for fund mismanagement.

While the WASU was financially accountable to the project authorities, the head of WASU, who had chief responsibility for implementation, was ultimately accountable to the LGA chairman who appointed him, leaving project authorities with few ways to deal with poor performance. In addition, despite a signed agreement, community water committees had no recourse if the WASU failed to deliver on its commitments. Similarly, there were no sanctions that could be applied to the communities when they failed to comply with agreed terms.

Source: Boerma (1993).

Box 5.7. Tanzania: master plan incompatibility with demand orientation

To ensure that villages with the greatest need for water systems were helped first, the Government of Tanzania implemented a series of lengthy and extensive studies to develop Water Master Plans (WMPs) for its rural water-supply program. From 1980 to 1983, project teams conducted water resources studies, water supply studies, and socioeconomic studies, and undertook pilot projects in three regions. Research for the socioeconomic studies alone included circulating a 300-question survey in all villages; preparing a detailed study of water use, sanitation, and health in 66 villages; developing a village participation program; and conducting substudies on such issues as water contamination, health education, and women's involvement. Results of these socioeconomic studies were not available in time to be included in the master plan.

A priority list of "high need" villages was developed in accordance with the WMP data that were available. High-need status was assigned to 644 of the 1,509 villages with the poorest accessibility to water, the lowest source capacity, and/or the highest health risks. Ironically, the master plan process was so extensive and time-consuming that conditions within project communities had changed drastically by the time the implementation phase began, making much of the data irrelevant.

Project implementers discovered that many of the communities on the priority list did not have a high "felt need." Demand for water systems was low in many of these villages, as was community interest in meeting project conditions. For example, villagers in one community were satisfied with their traditional water source; they had much greater interest in constructing a road and establishing bus service to a nearby town. Another community felt its need for a milling machine took precedence over its need for a water system. Clearly, the agency-defined criteria had been ineffective in assessing demand within the communities.

As a result, project implementers eventually set aside much of the WMP "priority list," arguing, among other things, that the information collected during the village survey in the WMP was insufficient or inaccurate; that the water supply conditions and needs had changed because of population growth or hydrological circumstances; or that political pressures had forced inappropriate inclusion of some villages on the list.

Source: DANIDA (1987).

Box 5.8. Tunisia: combining local knowledge with Geographic Information Systems

The development of over 2,000 Tunisian water-user associations through the Potable Water User project demonstrates the importance of joining local knowledge and modern information tools.[a] Together with the Central Tunisia Development Authority, the Government of Tunisia, and Tunisian geographers and sociologists (who assisted with spatial and socioeconomic analyses), the Institute for Development Anthropology composed a methodology based on geographic information systems for the siting of thirty new boreholes in the Kasserine and Gafsa governorates; the Institute introduced the notion of water-user associations at each new site. The methodology used socioeconomic, demographic, political, and environmental criteria, as well as conventional financial and hydrologic yardsticks, to propose sites.

Over time, as strategies evolved, the project produced three unanticipated results:

1. The Government of Tunisia became an enthusiastic supporter of the concept of water-user associations and encouraged the expansion of these associations from the 30 envisioned in the original project to more than 2,000 today.

2. The water-user associations became instruments for rural democratization as they confronted, one after another, the Ministry of Finance to demand control over their own finances. In general, the Ministry of Finance either accorded such autonomy de jure or acquiesced by withdrawing objections. Many of the water-user associations now have their own bank accounts.

3. Almost all of the water-user associations became entrepreneurial. The most common activity is recharging of automobile batteries, using step-down transformers driven by well pumps. Other new economic activities include women's handicrafts and weaving, as well as bathhouse and greenhouse operation where wells tap a thermally heated aquifer.

a. This project was not part of the 121-case sample.

Source: Personal communication (1994); International Development Association (1992).

but, while many projects mentioned participation, capacity building, and empowerment as specific objectives, many did not. Many of the less effective projects had no clearly stated objectives.

Goal of beneficiary participation. Local knowledge is unlikely to be used, despite its proven value, unless managers care about sustainable results and local participation. Did agency staff in fact have an incentive, either monetary or non-

monetary, to facilitate participation? They did in those instances where achieving beneficiary participation in decisionmaking was a clear goal or objective that was monitored and evaluated. Other incentives for encouraging participation come when local participation is a criterion in personnel evaluations and a measure of project success (see appendix 2). Myriad innovative ways were found to monitor and evaluate participation of beneficiaries in decisionmaking.

Participation is often viewed as a messy business that inherently defies specificity. Tasks that lack specificity are difficult to undertake and impossible to monitor and evaluate (Israel 1987). Hence, one challenge is to make participation itself more definable and specific and less monolithic. It is also true that there are many ways to reach the same goal. Tracking participation throughout the stages of a project can help establish accountability for achieving participation goals along the way, without forcing premature standardization of the means of getting there. *Participatory Evaluation: Tools for Managing Change in Water and Sanitation* (Narayan 1993) details several ways that participation can be monitored and evaluated.[28]

Increasingly, programs are monitoring participation and capacity building at the community level and using results to refine strategies. For example, the Karonga Lakeshore Integrated Rural Groundwater Supply Project in Malawi complements technical monitoring with sociological monitoring (see appendix 4). Several important insights gleaned from the sociological monitoring led to changes in program strategies. The village water and health committees, which were meant to be the main implementing organizations, were found to be less effective than the pump committees. Surveys revealed that 77 percent of the user groups were not even aware of the village committees, but all of the user groups knew about the pump committees. The program subsequently focused its training efforts on the pump committees. Making participation an indicator of success and establishing criteria to monitor and evaluate participation obviously cannot make participation occur. Documents for the World Bank-assisted project of 1977 in Tanzania stated that the Bank and the government of Tanzania "should refrain from equating success with quantitative criteria. Genuine achievement of the participatory objectives should be the principal criterion of success, even if in practice, this required a substantial reduction of the program" (quoted in Therkildsen 1988). Yet the participatory objective, as well as the cost-sharing objective, was abandoned in favor of speedier physical construction.

If projects are participatory—and if they make achieving participation a goal to which they are committed—they do whatever is necessary to achieve it. This includes adopting a learning-process approach to management.

Goal of building local capacity. Local participation occurred when it was supported by a focus on local capacity building and on strengthening the local social organization to manage the physical infrastructure. Clarity and prioritization of objectives is essential for those projects that are based on demand and participation and that use a learning-process approach, for two reasons. First, the objective of speedy, efficient physical construction often conflicts with the objectives of capacity building and sustainability. In the classic dilemma, the desire to maximize the productivity of drilling rigs must vie with the desire to wait for community readiness. Most projects in the study sample that were highly effective and participatory dealt with such dilemmas by making community organization and capacity a specific, high-priority goal to which they invested substantial money and time. The Togo Rural Water Supply project is one example. According to project estimates, 25 percent of the project budget was spent in supporting local capacity (see box 5.9).

The second reason for clarity and prioritization of objectives is that an adaptive learning-process approach by definition means that there is no implementation blueprint to follow. When dealing with uncertainty, it is important not only to be clear on objectives—and to establish benchmarks and intermediate steps, or to specify outputs—but also to allow, and indeed encourage, local solutions to be developed, even though no two communities or field offices may come up with exactly the same process. If new objectives are not spelled out and emphasized, project staff will most likely seek the security of the familiar procedures of the past. Even worse, agencies may standardize methods too early and develop

guidelines on how the community should participate, which amounts to the kiss of death for exercising voice and choice. When detailed rules rather than broad principles are promulgated, participation and sustainability flounder.

The temptation to standardize all procedures early, even before implementation starts, is especially great in large projects. Staff for large projects are scattered over wide geographic areas, come from different disciplines, and may have to deal with more than one organization. In such a situation, a common vision, and autonomy (supported by financial resources) to pursue whatever works in a particular context, is critical to project success. Accountability is established through the monitoring and evaluation—with communities playing active roles—of process indicators and intermediate outcomes.

In the Zimbabwean study mentioned earlier, Cleaver concluded that national guidelines, when painstakingly and unswervingly followed, were counterproductive to community responsibility and involvement. Examples abound. For one, the implementation policy that states that the community should dig the first three meters of a well was often misinterpreted to mean that the community should dig up *only* three meters. Similarly, guidelines for committees suggest the posts of chairman, treasurer, and secretary; these officers are dutifully elected, but often they have no duties and thus do nothing. Informal user groups were frequently found to be more effective than the official committees. In contrast, successful water committees in Côte d'Ivoire stepped outside the official guidelines to sell water, which gave incentives for careful monitoring to water minders and furnished finances for repairs.

Project experiences indicate that when local capacity building and decisionmaking are high-priority goals, effective managers allow time for participation to take root. Typically, a lead time of one to three months is needed so that people can express demand and organize themselves and the project can begin to establish a "trust partnership" and dialogue with community groups. This initial period may extend to a year, depending on the degree of community autonomy being sought. For example, CARE projects in Indonesia, which aim for total community self-financing (including capital costs), have found that initial organizational work takes about a year. Preparatory work also takes longer if demand must first be further generated through educational and awareness raising activities.

To summarize, participation is strongly supported if the design of the project has evolved based on local knowledge systems, if community capacity building is supported, and if participation is made a goal that is valued, monitored, and rewarded and linked to project evaluation criteria. The management challenge therefore is to create a framework in which the overriding objective is clear, higher levels of ambiguity and uncertainty are tolerated (since not all is known), and mechanisms and incentives are included to

Box 5.9. Togo: investing in capacity building

In the $16.7 million water supply project in Togo (1980–87), one of the main project objectives was to form, or strengthen, every village development committee (VDC). Project managers hoped that training communities to organize themselves would equip communities for solving not only water-related problems but other development problems that might arise.

Initial organization of the VDC took at least six to twelve months, with Social Affairs and Sanitation field agents providing follow-up support to each village. VDCs were created through a series of four village-level meetings between the field agents and the villagers, of which VDC members were selected to represent the community and project activities, objectives, and mutual responsibilities were discussed. The seven to thirteen people chosen for each committee were introduced to the village at an initiation ceremony.

VDC officers; village pump mechanics; women volunteers responsible for pump maintenance and oral rehydration therapy; and latrine and cistern maintenance volunteers received extensive training. VDC officer training included how to open a bank account, responsibilities of each office, how to obtain spare parts, and how to run community meetings.

In total, 864 VDCs were established and training provided to each. Besides participating fully in the construction and maintenance of the water system, village people, under the direction of their VDCs, went on to construct roads, market centers, pharmacies, and schools for their communities.

Source: Roark and others (1988).

foster client decisionmaking, responsibility, and capacity.

Responsive implementation. Project design elements can increase the ease with which participation can be induced. A key characteristic of a successful demand-based approach is that the agency is responsive to beneficiaries, adjusts and adapts to client demand, and enhances beneficiary capacity. Responsiveness implies that solutions and strategies are tailor-made for each situation, which in turn implies endless variability in detail. In this scenario, consensus on overall objectives and means becomes particularly important, although solutions are open-ended rather than predefined.

Engineering agencies have typically had primary responsibility for delivering rural water services, yet experience establishes that their technical blueprints—the pride of most engineers—and a "build-and-transfer" approach to projects do not foster dialogues and partnerships with communities before construction begins. Changing the focus of the engineering departments, however, would cause most engineers to lose professional interest and pride in their jobs. A young engineer in Pakistan in the Public Health Engineering Department summed up the sentiment thus: "I went to engineering school and learned how to design water systems; if I am now told to go spend the day talking to villagers who do not know what I know, I feel very frustrated. I would rather spend my time in front of my drawing board; otherwise what use is my engineering degree?"

Others have adapted to working in collaboration with extension workers from different ministries, but the underlying tension between the efficiency orientation of engineers and the stress on community readiness remains. As an engineer in Kenya put it: "From working with extension workers for three years I have finally learned how to hurry the people slowly."

Of the twenty projects with the highest ratings (summarized in appendix 2), almost 90 percent were implemented by NGOs and government ministries other than the public engineering departments. The governmental lead agencies included local government offices for community development, health, social welfare, and women's affairs. NGOs are not necessarily more participatory than government agencies, but their staff and method of operation are generally more community-focused and hence adaptive to varying community situations.

An example of the success that can be achieved when agencies are responsive to the desires and pace of communities, and respect community autonomy, comes from the story of community-managed water utilities in Meru in eastern Kenya and Ngorika in central Kenya (Bess 1990). Box 5.10 highlights the process that led to sustainable outputs through timely technical, financial, and management assistance to a community water society. The society evolved through the federation of a number of small, self-help groups that could not have developed further on their own.

Research for this study indicates that projects that were high in responsiveness were also flexible in implementation, allowing time for community organization. This study cannot definitively say whether projects achieved effectiveness through taking the time to involve beneficiaries or whether some other method produced the involvement. Regardless, since participation is positively correlated to effectiveness and ultimate efficiency, trade-offs between the time needed to organize participation and the amount of time required for implementation are likely to be positive. Inducing participation may be time-consuming upstream but may save time downstream.

Clients' listening to agency staff. Agency flexibility and autonomy are preconditions for adapting programs to the conditions of a particular environment, but several routes are open to agencies for responding to the requirements of differing contexts. Without some system of outreach and connection to clients, either direct or indirect, it is impossible for an agency to be responsive and adaptive.

Outreach can be interpersonal or it can be channeled through the mass media, or both. Gathered information can be brought to the agency office for planning purposes, or it can be put to service directly in the field after consultation with local groups. Either way, effective outreach would be difficult, if not impossible, in the absence of agency staff with the requisite skills, technology, and mandate.

Many projects used extension workers as their contact point with clients, yet, in general,

clients listened more to members of village-based organizations than to extension agents, intermediary NGOs, or local government units (data were scored separately for each type of organization). Nevertheless, the degree to which clients listened to the extension workers was highly correlated to overall participation ($r = 0.72$), which is not surprising because beneficiaries who care about the product being sold (the water system) are the ones who are more likely both to listen and to participate. The only factor that was significantly related to client listening was the prior commitment of clients. The form of the outreach also was analyzed, but because projects used a variety of outreach efforts, the effectiveness of different combinations of extension workers and agencies was not examined.

Overall, village-based organizations played a major role in 20 percent of the projects, extension workers in 22 percent, intermediary NGOs in 15 percent, and local government units in 3 percent. Conversely, 75 percent of all projects had practically no involvement with local government; 57 percent had no involvement with village organizations, 48 percent saw no extension workers, and 73 percent did not use intermediary NGOs. The study comprised a wide range of projects, including many that had little interest in supporting participation.

Box 5.10. Kenya: community-managed water utilities

The communities of Murugi-Mugumango and Ngorika in Kenya stand out as examples of successful community-owned water utilities run along commercial lines.[a] Both utilities started out as small, self-help water groups in the mid-1970s and evolved into sophisticated water societies with over 1,000 members each. The monthly revenues for the Murugi-Mugumango Water Society are approximately Ksh 35,000–40,000,[b] sufficient to cover their monthly expenditures of Ksh 30,000–35,000. While the Ngorika Water Society is smaller and less well established than Murugi-Mugumango, its monthly revenues of Ksh 8,000–10,000 are also sufficient to cover monthly expenditures (Ksh 7,000–8,000). In addition, both communities have consistently expanded the systems and operations over time, building offices, employing staff, and widening distribution.

Two factors contribute to the success of these communities' operations. First, both water societies received timely management training from NGOs and technical assistance (for construction design and supervision) from the Ministry of Water Development. Second, these organizations worked with the water societies to develop a commercial framework (based on paying for water) and a full set of rules, by-laws, and guidelines. Members defined the objectives of the society and delineated the rights and responsibilities of each member of the water cooperative and the penalties for noncompliance.

These member-created rules foster ownership and responsibility to the water system. For example, both water societies require that each member contribute a certain amount of labor as partial payment of fees. Cash payment in lieu of labor is actively discouraged by financially penalizing those who pay in cash. In Ngorika, for example, an individual would need to pay Ksh 100 in cash to satisfy a day of labor valued at Ksh 25.

Other penalties play a role in keeping the systems commercially viable. Both communities have stringent rules regarding nonpayment of fees or illegal connection to the water system. In Ngorika a member who bypasses a meter may be expelled from the society for life, be forced to pay a large fine, or have to plead her or his case before the general members to be reconnected. Nonmembers are taken to court. Ngorika has had no cases of illegal connection since the society's development, as compared with the earlier illegal connection rate of 20 percent.

Both water societies use disconnection as the penalty for nonpayment of fees, but they try to be flexible on this issue. They will accept partial payments on outstanding balances, and they refrain from disconnecting if a member explains his or her difficulties before defaulting. Reconnection fees are high, which discourages members from taking advantage of leniency.

Both water societies are flourishing. In 1985, when Technoserve's (an NGO) management assistance contract with Murugi-Mugumango ended, the water society had Ksh 500,000 in the bank and about 20 km of main and distribution pipeline with over fifty individual connections. Since then, 60 km of main piping have been laid and 1,160 members have obtained metered connections to the system. The society has built an office complex, employs 18 permanent staff, and has total liquid and property assets of almost Ksh 800,000. Ngorika is a younger organization, but in 1990 it had almost 60 km of main and distribution pipe, as well as 36 km of connecting pipe. It had 320 individual connections serving some 2,500 people, as compared to 48 connections serving 456 people before the society's formation in 1988.

a. This project was not part of the 121-case sample.
b. US$1.00 = Ksh 54 in 1994.
Source: Bess (1990).

Statistical evidence on agency characteristics. Table 5.4 presents the relationships between four outcome variables and the factors discussed above. The statistical findings generally support the lessons learned from in-depth analyses of individual cases. The outcome variables are participation, net benefits of participation, and two intermediate elements or measures of participation, namely, agency responsiveness to clients and client responsiveness to the agency. The table shows the following:

- Use of local knowledge contributes to both greater agency responsiveness and greater overall participation.
- Achieving participation, when defined as a goal of the project, has a net positive influence on actual participation. It has an even stronger effect on the perceived benefits of participation, as well as on increased agency responsiveness to clients and client interest in agency field agents.
- Autonomy of the project within the agency is associated, although weakly, with greater participation.[29] However, there is no evidence to suggest that project autonomy will increase agency responsiveness in the absence of additional incentives. The estimated impact of greater autonomy, controlling for other determinants of agency responsiveness, is negative.
- Projects that are physical target-driven are not more (or less) likely to be participatory or to have better responsiveness from the agency. Moreover, there is weak evidence that physical targets reduce the perceived benefits of participation and (even weaker) evidence that clients are unresponsive in target-driven projects.
- Greater flexibility is strongly associated with greater agency responsiveness. The reasonable conclusion is that an agency cannot be responsive to client demands unless it has some degree of flexibility.
- The extent of prior consensus on objectives had a modest influence on agency and client responsiveness.

Policy Lessons

The key findings presented in this chapter offer important policy lessons. To recap, beneficiary participation contributes to project effectiveness and can be induced in a variety of contexts. Five factors affect beneficiary participation:

- High demand and financial commitment made by clients before implementation
- Degree to which beneficiaries are organized
- Degree to which agencies incorporate local knowledge into project design and implementation and invest in capacity building
- Degree to which agencies make participation a goal, the achievement of which is rewarded, monitored, and evaluated
- Degree to which agencies are relatively autonomous and able to function without external interference.

Since participation is a long-term, iterative, nonlinear process that is difficult to standardize

Table 5.4. Relationships between client orientation and participation outcomes and elements

	Client orientation of agency					
Participatory outcome	*Use of local knowledge*	*Participation a goal*	*Autonomy of a project/ agency*	*Physical-target driven*	*Flexibility*	*Consensus on objectives*
Overall participation	0.20[b]	0.20	0.17	0.06	–0.02	0.00
	(2.5)	(1.9)	(1.8)	(0.9)	(–0.2)	(0.06)
Net benefits participation	–0.02	0.44[b]	0.15	–0.15	0.12	0.11
	(–0.2)	(2.9)	(1.2)	(–1.6)	(0.9)	(0.8)
Agency responsiveness	0.29[b]	0.29[a]	–0.13	0.07	0.36[b]	0.34[b]
	(2.7)	(2.0)	(–1.2)	(0.8)	(3.2)	(2.7)
Clients listen to field agents	0.01	0.30	–0.08	–0.07	0.22	0.23
	(0.1)	(1.8)	(–0.6)	(–0.7)	(1.5)	(1.6)

Note: Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001. Figures in parentheses are *t*-statistics.

or capture within a predecided time framework, it is useful to identify important elements, or intermediate benchmarks, of the participatory process. Three of those elements were found to be the extent to which communities were achieving control and ownership of the projects, the amount of capital and recurrent costs that clients assumed, and the responsiveness of agencies to clients. Local control and ownership was more likely to come to pass when clients were organized, when their organization was based on local collectives, and when they were skilled and displayed leadership qualities.

Furthermore, beneficiary participation is likely to occur when both agencies and clients see high benefits from such participation. The two determinants of high net benefits are client demand and agency commitment as signified by making participation an agency goal.

The foregoing summary of findings intimates that the key issues in achieving sustainable rural water services are institutional rather than technological (although appropriateness of technology obviously plays a part in effective projects). The policy lessons are several:

- Beneficiary demand and agency client-orientation are central to achieving sustainable services. Willingness-to-pay studies may be useful for setting policy parameters at the macropolicy level, but instituting a community self-selection process based on "hard choices" (a substantial cash contribution by the community, for example) is essential at the subproject level.
- Roles and functions of different actors at different levels must be clear and yet avoid overspecification of the details of implementation. Roles and functions should dovetail resources, responsibility, authority, and capacity. Implementation details and rules should be worked out with each community.
- Local capacity building is essential to maintaining physical infrastructure. The degree of investment needed in local organization varies, however, depending on objectives, preexisting local capacity, and functions to be performed.
- Blueprint master planning, budgeting, and procurement approaches cannot be used in demand-based national programs that support community initiatives. The course and timing of community efforts to organize and the appropriateness of a particular technology at a particular time are not predictable, and thus are not amenable to a master plan approach.
- Because many engineering agencies have trouble accommodating a community-centered approach, it makes sense for agencies that are already community-focused to be the key implementing agencies for projects. The still significant role of engineering agencies would then be to offer technical assistance and support to the implementing agencies.

Demand	*Beneficiary capacity*				
Prior commitment	*Extent clients organized*	*Skills, knowledge of clients*	*Traditional collective*	*Leadership among clients*	*Presence of strong leaders*
0.19[b]	0.23[a]	0.12	0.10	–0.14	0.02
(2.5)	(2.1)	(1.7)	(1.6)	(–1.3)	(0.3)
0.23[a]	0.05	0.02	0.04	0.01	0.14
(2.2)	(0.3)	(0.2)	(0.3)	(0.06)	(1.3)
0.07	–0.01	0.10	–0.06	–0.10	0.00
(0.7)	(–0.1)	(1.1)	(–0.6)	(–0.8)	(0.0)
0.30[b]	–0.02	0.14	–0.19	–0.17	0.15
(2.6)	(–0.1)	(1.1)	(–1.3)	(–0.9)	(1.3)

CHAPTER 6

Translating Lessons into Design Features

The lessons derived from the study and analysis of 121 rural water supply projects are clear. The challenge is to apply these lessons to the design of large-scale projects within a supportive policy framework.

Two overriding messages emerge from the study: (1) *beneficiary participation is critical for achieving project effectiveness and building local capacity;* and (2) *rural water projects have to be fundamentally redesigned to incorporate participation.*

When participation is merely one project activity among many, it fails to transpire. When agencies do not offer a menu of options, but instead supply one standard technology package irrespective of community demand, problems arise. When local people do not feel ownership of a project or water points, projects falter and facilities fall into disrepair. Even when agencies have the best of intentions and highly trained staff, participation will not become institutionalized unless user demand is the guiding principle permeating the design of projects.

The obvious conclusion is that participation is stymied unless the desire for "full community participation in all phases of a project" is supported by changes in key design features. Efforts must go beyond manuals that detail the standard application of "twenty-two steps to achieving participation." Redesign is essential for ensuring effective participation.

The first question to ask of any project design feature is *does it respond to community demand? By* By asking this question, several rural water supply projects in the World Bank's portfolio have transcended how-to manuals. Although the projects are at various stages of preparation or implementation, each has innovated ideas to ensure that participatory projects to reach the poor are demand-responsive. They highlight workable strategies and offer evidence that lessons can be put into practice within the framework of the Bank project cycle.

The projects, and results from this study, show seven design features to be particularly important for developing demand-responsive participatory projects:

- Selection criteria
- Demand assessment
- Institutional framework
- Funds and financial flow
- Choice of technology and service level
- Planning approach: master plan versus learning process
- Monitoring and evaluation.

This chapter examines these design features within the context of Bank projects.[30]

Selection Criteria

The most common criteria for selection of districts, subdistricts, and communities are water scarcity, poor water quality, presence of water-related diseases, difficult hydrogeological conditions, and

poverty. Typically, the villages selected for projects are culled from a master list, in accordance with these criteria or some variant of them.

As projects move toward a clearer demand orientation, two criteria become paramount: demand and poverty. When the implementing agency cannot accommodate all of the villages on the master list, other criteria are used to stratify the sample and to help rank the priority of villages. However, if community demand is not given primacy and if selection criteria are not transparent and supportive of decisionmaking at the local level, the scope for political selection of villages increases dramatically regardless of community demand, as experience bears out.

The Sri Lanka Rural Water Supply Project focuses on community-based planning, using a series of selection criteria as the centerpiece of its subproject review process. To ensure a demand orientation, communities have to apply to the project and request inclusion. Hence, the project does not prepare lists of villages, nor are the villages in which the project will be implemented predetermined.

At the outset, the project prepared only a limited number of engineering designs to provide guidance on what costs might be under different circumstances. Community-submitted projects are appraised on a case-by-case basis. The level at which the project is approved depends on the total cost of the project. All project proposals have to demonstrate that certain planning tasks have been carried out and that the project is technically sound and ready for implementation.

The criteria applied in a five-step project approval process are described in box 6.1. The preparation process for subprojects will be further simplified based on an examination of the first year's experience.

Although some countries still select communities according to externally determined criteria that indicate the severity of the problem (distance to a water source is one), several Bank projects have adopted a kind of scoring system, whereby an initial list of villages is compiled and final selection is based on community interest and demand.

Box 6.1. Sri Lanka: guidelines on community preparation and community commitment

In the Sri Lanka rural water supply project, the following guidelines are used by communities to prepare sub-projects and by the agency to judge community commitment and technical appropriateness of the project proposal.

Stage 1: technical criteria

- Establish that water supply improvements are necessary
- Select and accept CBO (community-based organization) for project management
- Acquire necessary land
- Resolve any water use conflicts (water rights)
- Determine project to be technically sound
- Coordinate village scheme with other villages
- Complete project proposal form.

If the proposal is not found satisfactory, it is returned for revision and resubmission.

Stage 2: sustainability criteria

To plan early for long-term maintenance of technologies chosen, four factors are given attention:

- Level of organization of community determined
- Willingness to pay adequately illustrated
- Environmental sustainability ensured
- Reliability of future supply from the source ensured.

Stage 3: cost analyses

The scheme should be cost-effective. The cost of the scheme to the program will be calculated on a per household basis. There is a built-in bias towards communities paying a higher proportion of costs for higher service levels.

If the proposal is still unacceptable by standard criteria, at this stage it is passed to the national level for more detailed assessment.

Stage 4: cost-benefit analyses

When the costs are higher than normal because of unusual features—hydrogeological or due to remoteness—costs have to be justified in terms of time savings.

Stage 5: extreme need appeal

If costs cannot be justified on time savings, acute need has to be established based on:

- Quality of existing water supplies
- Quantity provided by existing water supplies
- Reliability of existing water supplies
- Community poverty.

Source: World Bank (1992).

Thus, in the Indonesian rural water supply project, the government goes through a three-step process. Step one calls for drawing up a "long" list of villages—1,300 of them in the current project—based on water scarcity, poverty, remoteness, water quality, and existence of other ongoing projects; a short list is produced after screening for poverty (step two). The final selection of villages (step three) will be based on the Village Action Plans (VAPs) submitted by communities, which must demonstrate the village's willingness to take full management and financial responsibility for O&M.

Demand Assessment

There is clearly a need to assess community demand in a way that confirms the commitment of a group or community. Increasingly, communities are required to establish their interest in and capacity for undertaking a water project by hurdling a series of tasks specified in the project.

Three tools commonly used to assess demand are willingness-to-pay studies, participatory needs assessment, and beneficiary assessment. Willingness-to-pay studies estimate the value people place on an improved water supply by determining how much people are willing to spend for such improvements. Participatory needs assessment involves communities themselves in assessing their own needs and in determining whether water supply improvement is a priority around which the community can—and wants to—organize. For a beneficiary assessment, outsiders speak to, interview, and observe potential participants to find out whether water is perceived as a problem and, if so, what the community is willing to do to solve the problem. The three techniques complement one another and can be used separately or together. Only participatory needs assessment, however, sets the stage for community-initiated planning and action.

But even when such assessments are undertaken, projects will not be demand-based unless the studies are used to determine project strategies. Hence, rather than narrowly equating demand with willingness to pay, many projects are developing strategies for community self-selection into a project; willingness to pay is an important consideration, of course, but it is not the sole consideration. Self-selection into a project is a solid indicator of the community's collective demand *and* its willingness to make hard choices. thus, in the Sri Lanka project, communities (together with a local, nongovernmental implementing agency, if needed) have to fill out very detailed project proposals, submit evidence of consultation with different segments of the community, prove that land and water right conflicts have been resolved, and agree to pay the full cost of O&M and 20 percent of capital costs. As the service level rises, the community share of capital costs increases.

In the Pakistan rural water supply project, communities must sign a legal document, a "memorandum of understanding," which stipulates the mutual responsibilities of the different parties. In Azad Jammu Kashmir province, communities make cash and material contributions before the local government enters into an agreement with communities to improve the water situation. The process itself, which has been used for the last twenty years, is kept simple and non-bureaucratic.

SENASA, the water and sanitation agency in Paraguay, recognizes that community participation is essential for sustainability. After conducting willingness-to-pay and affordability studies, SENASA enters into a contractual agreement with the junta (a community's water and sanitation committee), but only after the community has fulfilled several specified tasks that establish its interest in the project.

Institutional Framework

The lead agency in most countries is usually the public works or water engineering department. Most of these agencies are neither trained nor interested in working with communities. The inefficiency and leakage from these large, central public work agencies have led to a search for alternative institutional arrangements and innovations. Another problem stems from the fragmentation of responsibilities among agencies and the need—most frequently unmet—to coordinate across departments. It is interesting to note that in countries where large-scale success has been achieved, the key implementing agencies have often been other than public engineering departments. Thus, in Malawi, the rural water supply

program is led by the country's Department of Community Development; in Colombia, by the National Institute of Public Health; and in Togo, by the Ministry of Social Affairs, Public Health and Status of Women.

Different countries are trying out different strategies, including decentralization (for example, fiscal decentralization and strengthening of a central ministry's field branches), greater involvement of the private sector (including NGOs), and creation of new units or departments that are better equipped than existing ones to reach out to communities and support community action. Although all Bank-supported projects include "institutional strengthening" components, the ones that aim at radical restructuring of the sector and policy reform include institutional reform as a specific objective, and they invest substantial resources in capacity building and training for agencies.

The key agencies for rural areas in Sri Lanka are the National Water and Sanitation Drainage Board (NWSDB), whose main focus is urban; the Ministry of Health, for sanitation; and 257 local authorities. The Government of Sri Lanka relied primarily on bilateral assistance for investment in rural areas, and lack of comprehensive policy or plans led to the introduction of over fifteen different handpumps in the country during the 1980s. As a result of a review of sector policy, the government adopted the District Development Plan (DDP), which employs a planning-by-district approach. The sector analyses also revealed inefficiencies in the sector; the government concluded that sustainability of rural water supply systems depended on communities and the private sector, including NGOs. The government role was redefined as regulator and promoter.

The Sri Lanka rural water supply project, which is supported by the International Development Association, will be implemented in three districts. The aim is to develop a community-based strategy that can be applied nationally. Project objectives include the following: (1) develop systems and institutions for community-based planning, implementation, operation, and maintenance of cost-effective and sustainable water supply, sanitation, and hygiene education; (2) implement community-based schemes in some of the rural areas and small towns of Badulla, Matara, and Ratnapura districts; and (3) prepare a follow-up project, applying the community-based approach developed and tested in this project, to complete coverage in the districts cited above and in other districts for which DDPs have been completed.

Since no single agency is responsible for rural water supply, the government will create a Community Water Supply and Sanitation Program Unit (CWSSPU) based in the Ministry of Housing and Construction. A national steering committee will advise the CWSSPU, but the new unit will have full financial control and autonomy to apply project review criteria, approve projects, and disburse funds. The CWSSPU will not directly implement projects itself; it will stead contract with other, intermediary implementation agencies (IAs) for that work. The National Steering Committee, which will be the policymaking body, will include members of the CWSSPU and representatives of NGOs and community-based organizations. Hence, experience from the project will inform policymaking and produce legislative changes needed to support the community-based approach on a national scale.

The NWSDB together with other specialized agencies will provide support to the CWSSPU to build the capacity of the intermediary implementation agencies. The NWSDB will assist with drilling; under contract, large NGOs and professional organizations will provide training for other technical tasks and help the implementation agencies devise community development strategies.

Any agency, either an NGO or one in the private sector, or the Pradeshya Sabha (the lowest-level elected authority) can apply to be an implementation agency for a project. An IA has to submit proof of its capacity to undertake the project, its past achievements, and the willingness of community-based organizations to work with it in implementing projects. Thus, all project activities will be managed by the IA, working in close collaboration with a community-based organization or a community group at the village level. Community-based organizations can also apply directly for grants.

These institutional arrangements mark a radical departure from the past, when public sector engineering departments had the responsibility for working with communities. The project review process described earlier, which enables

any group with credentials to qualify as an IA, introduces competition in service delivery. At the same time, large, more experienced agencies are tapped to train, support, and build the capacity of the smaller IAs that work directly with the communities.

Similarly, in Nepal a rural water and sanitation project now being prepared bypasses the Ministry of Public Works. With support from the Ministry of Finance and the National Planning Commission, the project will create a "Fund" outside the Ministry of Public Works. The Fund, which will be established by an act of parliament, will be managed by a board composed of representatives from the private and public sectors and NGOs. The Fund will develop a set of transparent criteria for disbursing grants to any agency—whether from the community, the private sector, an NGO, or the Department of Public Works itself—to provide water supply services for the rural poor. The details of Fund operations are currently being worked out.

In Indonesia, the institutional framework for the rural water supply and sanitation program for low-income communities is based on devolving power, authority, and responsibility to the provinces and, further, to the districts in six provinces. The institutions involved are the Ministry of Public Works, for physical development of water sources; the Ministry of Health, for water quality and health education; and the Ministry of Home Affairs, for institutional development and community participation. Decision-making powers for selecting communities and allocating resources are delegated to either the district or the subdistrict, depending on the complexity of the technology.

These projects involve NGOs and the private sector in a major way. Sri Lanka and Nepal conduct large publicity campaigns, disseminating information about the project and the Fund, to encourage any type of agency to participate in a project. Côte d'Ivoire involves the private sector in management and implementation that goes beyond just contracting for civil works, by stressing the importance of the regulatory and incentive structure as well as the different approaches needed for rural and urban sectors (Triche 1990).

Société de Distribution d'Eau de Côte d'Ivoire (SODECI), a joint foreign and local, private-stock holding company, was established in 1960 to manage the water supply for Abidjan. In 1978 the Ivorian government granted a lease contract to SODECI to operate and maintain all urban and rural water supply outside Abidjan. Construction performance was impressive. A total of 158 cities and towns and 90 villages were equipped with piped systems. In more than 8,000 villages, 13,500 water points had been constructed and equipped with handpumps. Financial performance for the urban areas was also good: collection rates were at 98 percent, and unaccounted-for water was at a low level.

Yet, as striking as these figures seem, performance in the rural areas was poor. A majority of rural water points were broken down. A centralized maintenance system resulted in costly and delayed repairs; communities were not organized; and villager participation was found to be weak. In general, rural systems were overdesigned and expensive. Since SODECI did not assume any commercial risk for poor financial performance and since shortfalls were covered by sector funds, there was little incentive to keep rural costs low or to monitor performance.

The water sector was reorganized. The government renegotiated its contract with SODECI for more favorable terms, with SODECI assuming more risk for proper operation in the urban areas. In March 1988 the strategy for the rural areas changed, with local contractors and artisans becoming involved. Responsibility for maintenance was gradually turned over to villages, and local people were trained in maintenance and repairs. The latest survey shows that, despite intensive technical training in repairs and distribution of spare parts through local automotive dealers, one-third of all pumps remain broken. Difficulty in coordination, and lack of demand and incentives at the village level to keep pumps functioning, were two problems identified as causes for this outcome.

Funds and Financial Flow

Institutional issues cannot be fully separated from financial and fund channeling issues. The key in managing demand-responsive approaches is availability of funds at the community level, funds that can be disbursed when needed, through simple mechanisms, with transparency

and accountability. In a review of funding mechanisms across sectors, Alexandre Marc (1992) found five features to be especially conducive to beneficiary participation:

- Flexibility in the use of funds is important since it is impossible to predict at the outset of a five-year project what will need to be funded, when it will be funded, and how much will be needed.
- Mechanisms for accessing and managing funds at the local level need to be simple since many local communities (and sometimes NGOs and local governments) are not yet accomplished at management.
- Mechanisms need to permit small disbursements of funds, given the limited capacity of small communities to absorb large disbursements.
- Mechanisms must be transparent to foster trust.
- Funding mechanisms need to be sustainable to support long-term capacity building at the local level.

Changing the way finances are managed and how money is allocated in the sector is a fundamental feature of institutional reform. Both the fund delivery mechanism (from donor to government to intermediary) and the receiving mechanisms (at the community levels, and at the agency level in recovering costs from the community) need to be addressed.

All projects that depart from direct provision of services by the public sector employ massive publicity campaigns at the outset to encourage wide-based participation and to prevent distortion of the fund's use. Transparency is the best guarantee against abuse. In Sri Lanka all financial investment decisions will be made by the CWSSPU and its field offices, not by the drainage board. Using implementation agencies and intermediaries will cut down on the total number of individual requests, but when the project reaches its peak, 400 requests will most likely be processed and implemented each year.

The third Paraguay rural water supply and sanitation project is the only one that specifically targets sector financing as its primary policy objective. The project states that its first objective is to organize "a sector financing system based on greater reliance on water users self-financing capability." This project also provides an interesting example of the importance of having incentives at the agency level for making the receiving mechanism work.

SENASA, which was set up as a decentralized unit of the Ministry of Health in 1971, initially had responsibility for a range of activities in water and environmental sanitation. In mid-1991 SENASA was restructured to streamline operations and to clarify responsibilities, and three autonomous directorates were created: one for water and sanitation, one for environmental health, and the other for administration.

Although the general approach to community participation and the mechanism for delivering finances to the community were developed in earlier projects, the third Paraguay project focuses on correcting the high level of arrears in debt service on loans that SENASA makes to communities. Discussions revealed that SENASA has had little incentive to press the juntas to service their debts, since these repayments were required to be deposited at the Central Bank of Paraguay in a non-earning account, and the approval process for withdrawing even small amounts of money for project use was cumbersome and lengthy.

As a result of negotiations with the government, SENASA is now permitted to manage its own financial resources, including recuperation of past loans. The agency was also allowed to establish an interest-bearing account to operate a revolving fund—under regulations and procedures promulgated by SENASA itself—to expand water services to other rural communities.

None of the projects lends directly to NGOs or to the private sector. In Bangladesh, however, the Grameen Bank makes loans to the poor for investment in wells and latrines. The approach has been successful; consequently, the United Nations Capital Development Fund turned over its large tubewell construction program to the Grameen Bank.

Channeling funds to communities for responsible use is the key to stimulating large-scale community initiatives, without controlling the form and extent of direct participation at the community level. Fiscal decentralization and establishment of funds for direct community access may be new phenomena for the rural water supply sector, but the Bank has considerable relevant experience with social funds and municipal investment funds. What is required for the water

sector is that the *ex-ante* control mechanisms currently used for disbursement of funds, as well as Bank procurement and auditing procedures, be simplified and adapted to give control and power to communities themselves.

For the Bolivia Social Investment Fund, the Bank approved the use of a unit-price costing system supporting direct contracting instead of open bidding. In Indonesia, where NGOs are not recognized by the central government and therefore are not allowed to compete in local bidding, the Bank encouraged management firms to enter into joint-venture arrangements with NGOs to compete in local bidding (Bhatnagar and Williams 1992).

A related issue concerns the legal status of community groups. Unless these groups have legal status, it is often difficult to channel resources or transfer ownership of assets to them. Many water projects have already addressed this problem. Projects that depend on community groups to be key actors—for example, the Nepal Community Hill Forestry Project, the India Integrated Watershed Development Plains Project, and the Nepal Bhairawa-Lumbini Groundwater Irrigation III Project—include specific programs to legalize groups.

Technology and Choice of Service Level

As long as technology and service level are predetermined and inflexible, community demand cannot be met, even if such demand has been assessed and aggregated. Studies done during preparation of Bank projects show that all clients—even the poor—want high service levels, and they are willing to pay substantial amounts for reliable service. Although many projects prohibit or limit the number of house or yard connections and insist instead on providing minimal service levels to the largest number, a few World Bank projects do offer service beyond the minimum, provided that users pay the additional costs.

Thus, in Sri Lanka, rather than drawing up detailed engineering designs for each village in a project area, the intermediary institutions spend time—after a community has expressed interest—explaining and working out the short- and long-term costs of different options; the community then chooses the technology and service level. A similar approach is planned in Indonesia; the government will allocate a fixed amount for capital costs and communities will make up the difference if higher service levels are desired.

Approaches to Planning: Master Plan or Learning Process?

The conventional master plan approach which focuses on "optimizing" technology for priority investment areas, is most common in the water sector. Extensive village-by-village surveys, focusing on population statistics, water availability, health, and socioeconomic and hydrogeological conditions, typically are the basis for the master plan. When the surveys are completed, preengineering designs are made; long before implementation, "blueprints" are developed for the communities, including detailed engineering designs with established costs. Contracts have often already been awarded by this stage. The several volumes of data and engineering drawings that exist for any one district or province encourage development of how-to manuals for project execution well before any implementation begins.

The master plan (or blueprint) approach calls for very little consultation with local people; there is no need to establish local partnerships. A master plan approach is therefore appropriate for centrally managed and controlled systems and for large construction projects. It is inherently antagonistic to a demand-based approach, however, which depends on responding to what communities want.

The alternative to the master plan is an approach that emphasizes learning by doing; the learning-process approach presumes that not everything can be known prior to implementation. NGOs have long used this approach, but it has only recently been applied to Bank projects.

In essence, a learning-process approach is a systematic way of learning by doing and of building in flexibility in the planning process (Korten 1980). It is a way to manage uncertainty when the doer does not know what will and what will not work in a particular context. It is a way to manage risk, and to minimize the risk of failure by not being forced to define one correct way of doing business before the evidence is in. The emphasis is on trying different institutional and technological

options that appear feasible in a particular context. Because no two communities are the same, standardization of details of implementation strategies is not only irrelevant but counterproductive and wasteful of resources.

The process does not assume that there is one right answer; it seeks to identify, through monitoring and evaluation, the key principles that can guide implementation and inform policy. The most important learning takes place at the local level; central to the concept, therefore, is involvement of all relevant stakeholders in the process. That involvement is critical for building local capacity, promoting local ownership, and inducing policy change.

When it is assumed that all the answers are not known but multimillion-dollar projects are still being planned, it is important that learning be effective and efficient: hence, the special importance of internal and external monitoring and evaluation procedures to guide project decisionmaking. The acceptance of the learning approach to planning has profound implications for the project-preparation process and for implementation strategies. Success in this approach is conditional on clarity of objectives and indicators of success, openness to learning, experimentation with different strategies, ceding of agency control, and tolerance of ambiguity.

The current water project in Indonesia is based on a "structured-learning" approach to community management. Even preparation for the project differed from that for conventional rural water supply projects. Since community management of rural water supply through government had never been successfully achieved in Indonesia, the World Bank team, the staff of the UNDP-World Bank water and sanitation program in Jakarta, and the Indonesian government became partners in collective problem solving. Project preparation for the six provinces was decentralized to the provinces, assisted by teams of government and local consultants from NGOs (CARE staff became consultants to the government).

As objectives, principles, and strategies emerged, it became obvious to all that what was being proposed was a radical departure from the past and that extensive data gathering for the entire project area would not be useful. What was needed instead was to try out the strategies that were being developed throughout the preparation process. Sixty-two villages (or starter areas) were selected in the six provinces to start implementation. Intensive and participatory data gathering was limited to these starter areas. Data were gathered by facilitators from the *kecamatan* and *kabupaten* levels through village self-assessment. Findings regarding willingness to pay and other data were used to develop the village action plan (VAP), which is a detailed document completed at the end of the village consultation process; the village and its water committee are signatories to the VAP.

Because the government wanted to use a learning approach to make the project design responsive to community demand, and because the project was decentralized, the preappraisal process could be participatory. In the capital of one of the provinces, the process included project preparation teams from the provinces and senior officials from the center and the provinces. The first two days were spent developing a common understanding of a learning-process approach through a series of hands-on activities involving sixty participants. The workshop was managed by the UNDP-World Bank Water and Sanitation Program.

The workshop started with officials drawing their vision of community management. Other activities included card-sorting exercises that prioritized the behavioral attributes needed at the community and agency levels to make community management work and that identified the critical decisions in the community-management process and the appropriate government levels at which decisions should be made. thus, the workshop clarified key concepts through an intensive participatory process and set the stage for evaluating provincial proposals based on common criteria identified by the participants.

A limited number of engineering designs were developed to establish cost parameters; procurement procedures were simplified to involve local contractors. Much time was spent in clarifying and simplifying the flow of funds to ensure that expenditures would be responsive to demand and that decisions for simple systems would be made as close as possible to the community level. The project includes a detailed training strategy to orient and train staff to support community-management strategies; 20 per-

cent of the budget is earmarked for capacity building at the agency and community levels.

Given the importance of monitoring and evaluation (M&E) for internal and external planning, one of the first project workshops will focus on developing the M&E framework, that is, the indicators and processes to be monitored at different levels. The capacity for monitoring process and outcome will be strengthened at the *kabupaten* level. Thus, rather than extensive data gathering prior to implementation, data gathering throughout the project cycle will become key to adjusting and refining plans during implementation. Planning will be undertaken for one-year periods, with resource allocation for the following year dependent on the performance of the previous year. This "rolling conditionality" ensures that the data gathering is put to use in decisionmaking. The budget is indicative only, with the expectation that after the first couple of years of implementation, better estimation will be possible.

One constraint to the World Bank's involvement in the rural water supply sector is that there are few large-scale successes in the countries where assistance is needed. It is also clear that successes depend on radical institutional reform, coupled with intensive community-level outreach activities. hence, success depends on new learning. The interval between a project's identification and the effective data of a credit or loan is often long, and that time could be used to implement the new strategies and options proposed by the project. That experience, in turn, could help refine the principles and strategies of the project once the loan became effective, thus, minimizing risks during large-scale implementation.

An increasing number of Bank projects therefore begin pilot activities during project preparation. This has been done in Indonesia, Karnataka (India), and Nepal. The Nepal rural water supply project (with involvement from the UNDP-World Bank program) includes a pilot project financed by the Japanese Grant Fund. The $1.5 million pilot phase will be implemented for twenty months before the effective date of the loan. It will test different service delivery options, document results, and test the working of the Fund approach proposed for the main project (see box 6.2).

Monitoring and Evaluation

Of course, managers worry about potential loss of control and accountability when decisions are made by hundreds of communities rather than by a central authority. Nevertheless, flexibility and accountability can coexist, if there is also a monitoring and evaluation system that can simply and effectively indicate what is going on at different levels.

In both the Sri Lankan and Indonesian rural water supply projects, monitoring and evaluation activities are important. Both projects seek to ensure that project agencies do not dominate the community decisionmaking process, and both emphasize community self-assessment activities. Selected information gathered at the community level flows upward through the system to keep the process simple, yet still ensure responsiveness to communities.

Box 6.2. Nepal: a new funding mechanism

In 1992 preparations began for the proposed US$18.1 million national Rural Water Supply and Sanitation (RWSS) Program in Nepal. The program is designed to include an autonomous RWSS-FUND, which will support demand-led, community-based water and sanitation initiatives. In March 1993, as part of project preparation, an innovative twenty-month field-testing program was initiated to test and refine proposed strategies, including the funding mechanism. The pilot program is funded by a Bank-executed Japanese grant (approximately US$1.5 million) and managed by the UNDP/World Bank Water and Sanitation program (TWUWU).

The RWSS-FUND will be managed by a board with representatives from both the government and the private sector (NGOs). The board will be autonomous, and fully responsible for the Fund's management. Funding will come from the Ministry of Finance through a simplified procedure consisting of the release of block grants once the Fund budgets have been approved by the Fund Board and Parliament.

The Fund mechanism, which is being tested in the pilot program, is largely similar to the final mechanism. For example, the pilot Fund's advisory committee is similar in composition to the proposed Board of the RWSS-FUND. However, the pilot Fund is managed by project staff and funded through a grant. So far, the mechanism appears to be working well.

Fourteen implementing agencies (support organizations/SOs) from the private sector (mostly NGOs) have qualified for funds, and 84 communities representing about 31,000 beneficiaries are participating. In addition, a pipeline of sub-projects is being identified for implementation when the main project is underway. The four phases of the sub-project cycle and the responsibilities of each group of participants are outlined below:

1. *Pre-development phase.* Selection of SO and sub-project according to a set of transparent eligibility criteria (felt need, sustainability, technical, economic, and environmental soundness). SO completes a pre feasibility study of a sub-project which forms the basis of a contract with the fund for the development phase.

2. *Development phase.* The water users' committee, with SO assistance, prepares a feasibility study of its own water supply and sanitation system. This feasibility study forms the basis for a contractual agreement among the Fund, the beneficiary community, and the SO for the next two phases (for example, implementation and post-implementation).

3. *Implementation phase.* SO provides hygiene and sanitation education, and trains the water users' committee and village maintenance workers. The beneficiaries construct the sub-project with support from the SO as needed.

4. *Post-implementation phase.* The continuation of hygiene and sanitation education, and latrine promotion by the SO, with operation and maintenance of the water system by the beneficiaries.

Preliminary findings indicate that district-based NGOs, localized NGOs, and CBOs are effective service providers, especially in many aspects of software. Large SOs have proven extremely useful as well, especially in their research and technical capabilities. Effective consortia agreements are being forged between the SOs.

With the support of SOs, most communities have successfully formed water users' committees, the majority of which are representative in terms of gender and ethnicity. Water users' committees in almost all areas have made advances in planning and construction. Although the development phase process (phase 2 above) is sometimes seen as time-consuming, some SOs have reported that the process results in much stronger water users' committees, as well as fewer post-construction problems.

Source: Legrain (1994); Pfohl (1993); World Bank.

CHAPTER 7

Conclusions and Recommendations

The lessons from this study have important implications for policy, project design, and implementation strategies for rural water-supply programs. The overarching one is that rural water projects must be fundamentally redesigned in order to reach the one billion rural poor who lack a sustainable water supply. Redesign must encompass a shift from supply-driven planning to demand-responsive, participatory approaches to ensure beneficiary participation, control, and ownership. Changes must be made at the sectoral policy and community levels; ignoring either level will create problems for both.

The conclusions and recommendations of the study are organized around three questions: What do we know about participation? If we know so much, why hasn't participation occurred on a large scale? What can we do differently?

What Do We Know about Participation?

Beneficiary participation—including participation by women—in the rural water subsector is essential for project effectiveness as well as for local capacity and empowerment of people for sustainability. Multivariate analysis established that even after controlling for the effects of eighteen other determinants, beneficiary participation is the single most important factor contributing to project effectiveness. Availability of spare parts and repair technicians and the appropriateness of technology are important, but the study found that without beneficiary participation (and hence beneficiary responsibility), water systems are unlikely to be sustainable even when spare parts and repair technicians are available. Beneficiary participation is also a significant contributor to other performance outcomes, including the percentage of water systems in good conditions, overall economic benefits, percentage of the population covered, equality of access, and environmental effects.

Among the proximate determinants of outcomes, beneficiary participation was found to be a significant determinant of both overall quality of implementation (instead of quality of overall project design) and quality of operation and maintenance (instead of quality of construction). The quality of design was significantly negatively affected by complexity of the design, as measured in part by the number of different activities and organizations to be coordinated.

All relationships between proximate determinants and beneficiary participation were weaker when measured separately for participation at a particular stage of the project. Thus to maximize its benefits, participation must be treated as a continuous process. Beneficiary participation is important throughout the life of a project; it is a cyclical, iterative process that cannot be broken into elements. In other words, participation cannot be effective when it is limited

to the later stages of a project, as it is in the "handing over" syndrome.

Study findings prove that participation is not a nebulous concept; it can be defined, measured, and observed. Participation is dynamic, and its nature changes over a project cycle; mechanisms and forms of participation vary widely depending on project objectives.

The extent of beneficiary participation achieved is determined by characteristics of both the beneficiaries and the agencies. The two key beneficiary characteristics are demand, or commitment made before project implementation, and the degree to which beneficiaries are organized for their role. The three key agency characteristics are the extent to which local knowledge is incorporated in a project, the establishment of participation as an agency goal that is monitored and evaluated, and the relative autonomy of the agency to manage its affairs. Participation is most likely to occur when both beneficiaries and agencies perceive the net benefits to be high, as they do when beneficiary demand is high and agency commitment to the goal of participation is firm.

Markers on the road to realizing participation are user financial investment in the project, the degree to which local groups achieve control and ownership, responsiveness of the agency to clients, and the extent to which users listen to field agents or extension workers. In turn, local ownership and control are more likely to be achieved when beneficiaries are organized, when the organization is based on local traditional collectives, when clients are skilled and have leadership qualities, and when agencies themselves have autonomy to allow local control of subprojects.

Achieving participation can be costly, consuming perhaps as much as 15–20 percent of the project budget, and it is not necessarily simple. The rich, the elite, and the formal leaders can be effectively coopted, however, to support poor people's participation in decisionmaking and to bring additional resources to their community. And although neither communities nor subgroups within communities, such as women, are homogeneous, commonality of interest can bring people together to solve problems when the need is great.

Over time there is movement from intense, informal, direct forms of participation to more formal, indirect forms through various representational strategies. As goals are met, mechanisms set up to manage intense levels of participation often are dissolved or adapted to new activities.

Why Hasn't Participation Occurred on a Large Scale?

Notions of people's participation have been around for a long time in one form or another. What has gone largely unrecognized is that participation is a process with important implications for policies, organizations, budgets, resources, and staff skills. In other words, participation affects institutions, and the main reason for lack of participation on a large scale has been reluctance to frame the issue in institutional rather than technological terms.

Viewing rural water supply primarily as a technology issue reduces participation to simply one more add-on task which gets done as long as it is convenient, free, controllable, and available when commandeered. Such a narrow conception of participation as a microlevel activity with no linkages to policy and institutional reform hampers large-scale beneficiary participation. Moreover, several pervasive, damaging myths about the water sector bear directly on the ability to institutionalize participation.

Myth: *The poor are unwilling to pay and they cannot afford to pay; therefore, water should be provided for them.*

Fact: *The poor are already paying, often more than the rich; the poor will pay if they get reliable services.*

World Bank-sponsored studies demonstrate that poor families sometimes pay ten to one hundred times more than the rich for water, since they have to buy it from vendors. The poor also travel the farthest to get water, often from polluted sources that adversely affect health. Experience in projects around the world establishes that when communities are in charge, they apply culturally appropriate ways of instilling responsibility and ownership without excluding the poor. These strategies range from setting fees on a sliding scale to having the poor and destitute contribute their labor to a project.

Myth: *Poor people cannot solve problems or manage technology; they do not know what is good for them.*

Fact: *People in poverty are creative. Every society employs elaborate organizational systems and rules for managing natural resources.*

Experience demonstrates that where government largesse and population pressure have not destroyed traditional water-management systems, these function effectively and maintain a balance between human needs and environmental protection. People in poverty can adapt traditional institutional forms to meet new challenges; they have done just that in many parts of the world when they have had assistance in doing so. Innumerable examples of local organizations finding solutions in the face of ecological, financial, and technology constraints attest to human ingenuity.

Myth: *To achieve equity, the service level provided must be minimal so that limited resources can be spread as far as possible.*

Fact: *If people are not given what they want, they will not organize to undertake collective action or pay requested fees.*

Participation cannot correct for fundamental inability to match what people want with what is offered. While it may be important to spread limited resources to a large segment of the population, strategies have to be developed so that subsidies do not detract from the community self-selection process. The service level should be based on the willingness of a community or household to match or add to partial subsidies to achieve the desired service level.

Studies from India and Thailand prove that people are willing to pay for a high-service level (namely, hard-piped water connections), although they are unwilling to pay lesser amounts for communal facilities.

Myth: *If beneficiary participation is made a goal, women will be reached.*

Fact: *In most cultures, unless women are specifically targeted and strategies are developed for their empowerment, they will not be reached.*

In most rural societies poor women are more disadvantaged than poor men. Women work longer hours and have less free time; they have less income; they are more isolated; they receive less information; they have poorer nutrition and health; they have less education; and they are often more illiterate than men. They are rarely community leaders, and they do not participate in community decisionmaking bodies. Although women are the primary carriers of water, they have limited power, access, and control over resources. In this context, how can women possibly be reached without special support and investment in their development?

The study found that of the twenty most participatory projects, about half successfully reached women. The study also found that the factors determining women's participation were different from those affecting overall beneficiary participation. Unless programs make women's empowerment a specific goal, women's participation will not move beyond tokenism.

Myth: *Public sector agencies and engineering departments must be the service providers, since the main task is construction and the main indicator of success is construction completed.*

Fact: *In rural areas where there are few economies of scale, engineering departments are successful when they monitor and provide technical support to others (NGOs, the private sector, and other nonengineering government departments). The key task is creation of local management and institutional capacity for sustainability after construction.*

The technology issues in rural water-supply projects are well known. Further technological innovations may be important, but the key challenge is to create local ownership, organization, and responsibility for the management of assets. Typically, public engineering departments have neither the capacity nor the culture or temperament to empower the poor. They should do what they can most efficiently do, which is to provide technical assistance and monitoring as needed.

Of the twenty most effective projects in the study, over 90 percent were executed by NGOs, parastatals, and government ministries other than the public works or engineering departments. The renowned Malawi self-help project

began in the country's community development department in the late 1960s; by the time it was taken over by the public works ministry, it had absorbed a strong community-development orientation.

Myth: *Master plans based on extensive data gathering before implementation are needed so that a uniform approach can be implemented.*

Fact: *Blueprint, master plan documents stifle the growth and evolution of participatory programs; data collection need not be extensive before implementation, but it does need to continue throughout implementation. Too-early standardization of implementation procedures leads to failure.*

Extensive planning before implementation shortcircuits community decisionmaking. The temptation is to manipulate community choices so that they fit what has already been decided, yet success depends on communities taking initiative and choosing what they want. Extensive, village-by-village data gathering is unnecessary; rather, data collection before implementation should aim simply to set the parameters and develop the processes and strategies for managing a learning process. Detailed data collection is relevant only during the implementation process, as communities, together with community facilitators, develop village inventories for analyzing their particular situations. In the absence of blueprints, two-way information flow becomes an important tool for managing change within a short planning cycle. At the same time, the focus of project data collection before implementation shifts to institutional analyses, which are accompanied by a search for experience across sectors to guide the flow of funds so that financial mechanisms can support community self-determination.

Managers who use the blueprint approach to planning have difficulty tolerating the high levels of uncertainty and ambiguity inherent in participatory projects. The blueprint design approach provides a sense of security by creating the illusion that all is known and under control. Experts who manage large sums of money believe they can reduce risk by knowing all the answers. They are therefore reluctant to adopt a structured-learning approach, which presupposes that all cannot be known and that a range of institutional options must be tried, monitored, and refined over time to match community demand and local management capacity. But risk can be reduced by offering options and by planning for shorter periods of perhaps a year, with later plans developed after evaluating the experience of the previous year.

Myth: *User decisionmaking is important but should be limited to well-defined parameters; control should remain with project managers.*

Fact: *The whole participatory process is about giving people a voice and a choice. Participation cannot be turned on and off by outsiders; participatory processes mean giving control to communities.*

There is a tendency to underestimate what people in rural communities can achieve, although most communities manage communal and private resources effectively. Yet giving people choices does not mean that they must do everything themselves and become experts in all technical issues. Explaining new technology in terms of short- and long-term costs, and laying out the ultimate financial and organizational implications of the new technology, helps communities make informed choices.

Participation is a long-term process that cannot be effective if it is restricted to certain stages of a project (for example, handing over water systems to communities after construction is completed). When communities choose and supervise contractors who are required to satisfy them before receiving payment, not only do costs decrease but the shift in the power balance and accountability reinforces community empowerment and ownership and responsibility for the project's physical assets.

Myth: *Participatory approaches take a very long time and can only be done on a small scale.*

Fact: *When projects respond to demand, action is rapid and the community organizational process occurs quickly.*

When agencies assume that the need for a project is great in the absence of a community expression of need, eliciting participation becomes a hit-or-miss affair. Things go well if a match between demand and response is in fact

achieved, but eliciting participation becomes problematic if the community has different priorities. In this situation, educational activities have to precede community organizational activities. Experience shows that community organizational activities generally take between two and six months, depending on the degree of self-reliance sought. In sum, the study demonstrates that participatory approaches can be used on a large scale.

Myth: *Beneficiary participation is difficult to replicate on a large scale because it requires the presence of charismatic leaders, NGOs, and other special, gifted people.*

Fact: *Beneficiary participation is replicable. Charismatic leaders are useful for starting the process, but broad-based leadership keeps the process going. NGOs are often more successful in adopting empowerment strategies, and they can be effective intermediaries. Like other technical specialties, skills in designing and implementing participatory programs are learned.*

The presence of charismatic leaders at the community level may be needed to start and energize collective action, but the study establishes that broad-based leadership qualities are more important than charismatic leaders for sustaining the organizational process.

NGOs played important roles in many of the most effective projects in this study (see appendix 2). About half of these projects were executed by NGOs, and NGOs were involved as partners with government agencies in other projects as well. Other executing agencies for the most effective projects included parastatal organizations and government departments of health and community development.

Myth: *Participation is a nebulous concept that is difficult to define and measure. The goal of human development through participation in decisionmaking is important but impractical.*

Fact: *The concept of participation can be put into operation and measured simply. Measuring, monitoring, and evaluating participation makes agencies more accountable to supporting human development through participation.*

It is often assumed that participation and other project "software" are too messy to be measurable. This is a fallacy. Most planners will not fully consider participation unless it can be measured and its benefits proved, at least to some extent. Making participation a goal at the agency level, combined with monitoring and evaluating participation and linking it to successful performance, was an important determinant of beneficiary participation in the projects covered in this study. But unless using participatory strategies and studying their impact are considered as indicators of success or evaluation criteria, there is ultimately little incentive for project staff to support this relatively unpredictable, uncontrollable task. Fortunately, the study also shows that simple measures and benchmarks *can* be developed, and that community people can come up with the most situation-specific and meaningful indicators of their participation.

What Can We Do Differently?

Obviously, the main challenge at the country level is to change policies, institutional structures, project design features, and implementation strategies to support beneficiary participation in demand-responsive service delivery. It is important to involve all stakeholders in this process, and to ensure that the process is participatory, so that ownership of institutional reform and project design clearly lie with the country. Six areas are particularly important at the national or subnational levels for managing the necessary changes. These concern the clarity of objectives, the funding mechanism, the selection criteria, the planning process, the intermediaries, and the community organization.

Clarity of Objectives

Objectives must go beyond general statements of "provision of improved water and health." The most important specific objectives to address are sustainability and effective use of the water system and capacity building of local people, especially the marginal—the poor and women—through participation in decisionmaking. If a project aims for institutional reform to achieve these objectives, this should be stated at the outset so reform can drive the project; if the objective is to set up

decentralized, community-based systems, that needs to be stated; if the objective is to achieve community participation and women's empowerment, the goal should be stated as such. Only then can links among objectives, planning strategies, and monitoring and evaluation criteria be clarified and mutually reinforcing from the start.

Funding Mechanism

The funding mechanism for projects has to be set up to quickly respond to demand, if projects are to truly support local-level decisionmaking. The study finds, in fact, that the funding mechanism is *the* most important factor affecting the demand-responsiveness of projects. Funds that can be disbursed easily, in small amounts, and with minimum bureaucracy and with accountability, enable local-level decisionmaking on a large scale without creating entirely new organizational structures. This is one of the main reasons that NGOs have been able to work with communities more successfully than have large government agencies.

Decentralized funding with transparent criteria for accessing funds is critical for effective local government involvement; it is also necessary for getting the private sector and NGOs involved in service delivery as intermediaries or as providers of specialized services needed by the community. Decentralized funds are essential to close the gap between where the construction takes place and where the decision is made to commit and release program funds.

Except where fees are collected to provide services, community funds for operation and maintenance should be left with the community to manage. This increases local ownership, responsibility, and accountability, and minimizes transaction costs.

Selection Criteria

The selection criteria should support the primacy of user decisionmaking. Since the policy environment is not the same in all developing countries, the focus needs to be on the principle of community self-selection, which includes user investment in capital costs. It is important to institute a process whereby communities establish their commitment by undertaking particular tasks and raising all (or a certain percentage) of capital costs before construction begins. Communities must have a stake in the continued functioning of the water system.

Three tools for assessing demand are particularly useful: participatory needs assessment, beneficiary assessment, and willingness-to-pay studies. The latter are especially important in gauging the interest in different service levels and in guiding the early planning for the overall project.

Planning Process

The planning process should focus on learning. In project design, this implies clarity and agreement on objectives, clear definition of indicators of success, and a framework for monitoring and evaluation to guide management decisionmaking at all levels to allow for flexibility. When this learning process is applied to projects, budgeting becomes an effort to estimate expenditures in different categories, with the express recognition that pinpointing costs for narrowly disaggregated categories of expenditures against a timeline is counterproductive. Long lists of village inventories are not needed for the planning process; instead, data should focus on institutional capacities, creation of appropriate funding mechanisms, strategies to interact with communities, and pilot activities to try out the strategies suggested while the project is still under preparation.

Intermediaries

When programs have to respond to the needs of hundreds of scattered communities, large, centralized agencies in the public sector are neither effective nor efficient in service delivery. Greater attention must be paid to institutional analyses of other agencies that can serve as intermediaries. If institutional reform and institutional capacity building are envisaged, these must be made specific objectives; the goal must go beyond providing hardware and infrastructure and setting up special units for preparing and monitoring projects.

The choice of engineering departments as the lead agencies should not be a foregone conclusion. Instead, other agencies (including NGOs) with an established community orientation and presence should be drawn into new partnerships.

A multiplicity of executing agencies fosters competition and encourages centralized agencies in the public sector to give up control of the details of implementation.

Community Organization

The effective use, operation, and maintenance of a water system at the community level depends on users, individually and collectively. The degree of organization necessary to keep the technology working and effectively used depends on the functions that the community organization is to perform. Thus, investment in strengthening the capacity of community water groups must be greater for water-user groups that are expected to manage the water systems on their own than for groups that merely report breakdowns to higher levels.

Given the record of limited government resources, scattered communities, and poor maintenance, most rural water programs must invest substantial resources in building the capacity of community-level institutions to work autonomously or in partnership with other support agencies. This investment in community organization recognizes that technology is embedded in a particular social fabric and requires the interest, talent, and skills of individuals working in coordination to manage resources to keep the system functioning into a changing future.

Appendixes

Appendix 1A. Participation with Other Direct Inputs into Water Project Effectiveness

Dependent variable	*Adjusted R^2*	*Participation*	*Adequacy of facilities*	*Difficulty in holding staff*	*Availability of parts*	*Clarity of objectives*
Overall effectiveness	0.85	0.28	0.14	–0.05	0.57	0.22
		(5.3)	(1.8)	(–1.1)	(9.6)	(2.9)
Percentage of water system in good condition	0.69	0.30	0.10	0.17	0.71	–0.02
		(3.1)	(0.7)	(–2.0)	(6.6)	(–0.17)
Economic value of benefits	0.67	0.27	0.23	–0.11	0.38	–0.8
		(4.1)	(2.5)	(–2.0)	(5.3)	(0.12)
Percentage of target population reached	0.22	0.17	–0.05	–0.12	0.13	0.07
		(1.9)	(–0.4)	(–1.6)	(1.4)	(0.5)
Environmental effects	0.11	0.23	0.01	0.03	0.11	–0.11
		(2.8)	(0.07)	(0.4)	(–0.9)	(–0.9)
Equality of access	0.14	0.26	–0.13	–0.05	0.08	0.22
		(2.3)	(–0.77)	(–0.5)	(0.5)	(1.44)
Community empowerment	0.74	0.59[d]	0.24[a]	–0.04	0.33[d]	–0.14
		(8.2)	(2.3)	(–0.7)	(4.1)	(–1.4)
Water–system task capacity building	0.68	0.70[d]	0.16	–0.02	0.22[a]	–0.19
		(8.3)	(1.3)	(–0.3)	(2.4)	(–1.7)
Extent local organizations strengthened	0.72	1.01[d]	–0.02	–0.03	0.10	–0.03
		(10.0)	(–0.16)	(–0.4)	(1.0)	(–0.3)
Net effect on leaders	0.18	0.26[b]	0.04	0.03	–0.02	–0.03
		(2.9)	(0.3)	(0.4)	(–0.2)	(–0.2)

Note: Significance levels are indicated thus: a = significant at 0.05; b = significant at 0.01; c = significant at 0.001; d = significant at 0.0001. Figures in parentheses are *t*-statistics.

Appendix 1B. Participation with Eighteen Direct and Indirect Inputs (Model 3) into Project Outcomes

Outcome[a]	*Adjusted R^2*	*Participation*	*Availability of parts*	*Objectives specified*	*Appropriate technology*
Overall project effectiveness	0.86	0.24 (3.8)	0.44 (5.6)		0.19 (2.3)
Objective value of benefits	0.72	0.26 (3.6)	0.26 (2.8)	–0.30 (–2.6)	
Percentage of water system in good condition	0.65	0.29 (2.4)	0.69 (4.4)		
Environmental effects	0.13	0.23 (2.3)	0.11 (0.9)		
Percentage of target population reached	0.26	0.25 (2.4)	0.07 (0.5)		
Equality of access	0.40	0.17 (1.5)	–0.14 (–1.0)		

a. Except for participation and availability of parts, values are reported if statistic is significantly beyond the 0.05 level.
Note: For overall project effectiveness, the *t*-statistics were significant at the following levels: participation = significant 0.0004; availability of parts = significant 0.0001; appropriate technology = significant 0.02; quality of management = significant 0.10.

Agency understanding	*Management*	*Skills of staff*	*Geological/ environmental context*	*Political context*	*Social context*
	0.22 (1.64)				
	0.3 (1.9)				
		–0.35 (–2.10)	0.31 (1.19)		
			–0.29 (–2.4)		
0.38 (1.9)		0.4 (2.4)		0.61 (2.6)	0.54 (2.7)

Appendix 2. Projects Rated High in Overall Effectiveness

Country (duration of project)	*Cost (population reached)*	*Institutional framework*	*Technology (choice)*	*Objectives*
Swaziland (1979–89)	$8.3 million (52,000)	• Ministry of Natural Resources, Land Utilization, and Energy (MNRLUE) • Ministry of Health (MOH) • Rural Water Supply Board (RWSB) of the MNRLUE • Health Education Unit and the Health Inspectorate of the MOH • USAID/Government of Swaziland (GOS)	Buried pipe from protected source to standpipes and taps (Yes, as guided by RWSB)	• Provide piped water and associated sanitation improvements to rural communities • Alleviate water-borne diseases • Develop GOS institutions, especially Public Health Engineering
Ethiopia (1982–86)	SEK 8,744,300 (56,000)	• Arsi Rural Development Unit (regionally based government agency) • Revolutionary Ethiopia's Women's Association (REWA) (national women's association) • Swedish International Development Authority	Spring source, gravity-fed, community taps (No information)	• Supply clean water within 2.5 km • Release 8,000 women from burden of drawing water • Supply enough water to improve hygiene • Provide training • Women's participation in all phases • Empower women
Panama (1972–81)	$27.7 million (approximately 200,000)	• Department of Environmental Health (DEH) • Ministry of Health (MOH) • Water Task Force • Community Health Committee • USAID	Primarily piped-water systems, household/yard connections, some handpumps (No information)	• Improve health and quality of life • Reduce rural-to-urban migration • Provide safe water for domestic use • Lessen women's burden • Community participation and responsibility for O&M
Ecuador (1984–86)	$825,527 (20 sites with populations of 75–2,500)	• Catholic Relief Services (CRS) • Ecuadorian Institute for Sanitary Works • Secretariat of Integrated Rural Development • National Health Council • Ministry of Public • Ecuadorian Episcopal Conference (religious NGO) focused on health education • Local water committees/juntas • USAID/CRS	Gravity-fed pipe systems (No information)	• Produce change in living standards • Provide safe drinking water at low cost • Have active participation of community responsible for O&M • Produce spin-off activities

Demand and its assessment	*Community participation and specific strategies*	*Success indicators*
• Community seeks out RWSB aid • Community fulfills RWSB requirements, forms committee; establishes maintenance fund; community must have resettled according to rural development agency guidelines; provides labor; selects water minders; constructs latrines • Community completes survey showing all above requirements have been met	• Utilizes community meetings • Provides training • Involves community in assessing needs • Community in charge of O&M • Consults women in assessing water and sanitation needs, identifying water sources, and in siting standpipes	• Provides access to water systems to approximately 9% of rural Swaziland • Community develops new projects • Effective O&M • Women form majority of most water and sanitation committees • Women hold key WSC positions, manage the money in operations fund • Women recognize time savings and convenience in project area
• Dodota women recommend drinking water project • Women's Association members all agree is water most important need • Community pays user fees • Community contributes labor	• Participation an objective • Work through regional REWA • Recruit women for training through elections at Women's Association • Provide focused training to recruited women • Pay salaries to tap attendants and other trained personnel • Tap attendants financially accountable for unconfirmed gaps between water use and collected fees • No blueprint plan to follow—allows time and opportunities for participation • Public recognition (ceremonies) for training	• Time savings for women used for income generation; childcare; meeting attendance; social activity; home gardens; domestic duties • Women satisfied with training • Women successfully complete salaried jobs • O&M good, including preventive maintenance • Women feel freer (for example, from total reliance on husband or from agriculture as primary income source to plan future • Community sees women as capable of doing new jobs • Trained/salaried women seen as models for others
• Communities submit WSS request to national representative • Communities contribute cash and labor 20% of construction costs • Create community health committee	• Participation is an objective • Work through Community Health Committee • DEH informs community of obligations; DEH and community sign contract; MOH contacts local leader; public ceremony to hand over system; DEH trains community for O&M, community is responsible for O&M • Installation postponed if criteria not met • Involved local leaders • DEH provides technical assistant after project transfer	• Community satisfaction with water quality and quantity • Effective O&M management by community • Evidence of community problem solving (for example, raised funds to buy new pump; capped new spring; elected new managers, created graduated payment systems) • Time savings for women; used for income generation, childcare • Women empowered (management role on water committees; emerged as leaders) • No systems abandoned
• Community requests system • CRS evaluates request • CRS selects request; implements in-depth community survey; approves request • Community signs agreement • Community expresses willingness to participate and builds family sanitation facility	• Community participation key criterion in screening request • Community elects junta • Junta collects fees and is responsible for O&M • CRS gives funds directly to junta • Junta purchases inputs and labor and employs maintenance operators	• Community trained in record keeping, applies for bank loans, builds new facilities • New homes being constructed • Health improved • Women in junta and are involved in construction and O&M • Water quality/quantity good

(Table continues on the following page.)

Appendix 2. (continued)

Country (duration of project)	*Cost (population reached)*	*Institutional framework*	*Technology (choice)*	*Objectives*
India (1988–91)	Rs31.42 lakhs (handpumps) Rs140,000 (pumped water schemes) Rs14 lakhs (Latrines) (137 villages with population of 300–2,000)	• Rayalaseema Seva Samithi (RASS) (an NGO)	Borewells, handpumps, piped-water schemes, latrines (No)	• Improve water and sanitation (construct handpumps, pumped water schemes, latrines) • Provide water to region without potable water 7–8 months of the year • Empowerment and participation
Kenya (Phase 1: 1980–83) (Phase 2: 1984–88)	Approximately $6.5 million (68,000)	• National Water Conservation and Pipeline Corporation (NWCPC) (parastatal) • Ministry of Water Development • DANIDA	Piped-water, gravity scheme and water treatment (Yes)	• Improve health and hygiene • Improve dairy farming and vegetable production • Reduce burden of carrying water
Malawi (1980–88)	$9 million (465,000)	• Government of Malawi Department of Lands, Valuation, and Water (DLVW) • Ministry of Health • Village Health and Tap Committees • USAID	Gravity-fed systems, communal standpipes (No information)	• Improve basic living conditions and health of rural population • Reduce water-related diseases • Increase disposable time for rural women and children • Provide health education
Togo (1980–87)	$16.7 million (600,000)	• Ministry of Public Health, Social Affairs, and Women's Welfare • Ministry of Civil Works, Mines, Postal Services, and Telecommunications • Ministry of Planning • National level coordinator • Regional level coordinator • Sector/Prefecture coordinator • Village development committees • Multiple donors	Boreholes, springs, cisterns, latrines (No information)	• Provide safe drinking water to rural villages in plateau and savannah regions • Establish village development committees (VDCs) in 350 villages • Provide training to field agents, VDC members, and village volunteers in project activities • Prevent water-related diseases • Increase community self-sufficiency, especially in maintenance; community development

Demand and its assessment	*Community participation and specific strategies*	*Success indicators*
• Region has no potable water 7–8 months of the year	• Participation is a specific objective • Capacity building through education, leadership training, forming committees • Utilizes existing committees • Community contributes funds and labor • Community assists in site selection • Utilizes local "social workers" as community representatives • Conducts meetings and 2-day "awareness generation camps"	• Achieved good portion of construction • Women trained as caretakers • Panchayats in water-scheme villages passed resolution to undertake operation and maintenance • Community participation in providing funds, site selection, road repair, land donation
• Lobbying by Aguthi village water committee • Labor input • Dug trenches for own connections • Consumers pay monthly charge	• Work with Aguthi water committee • Cooperative relationship with chiefs and subchiefs • Water access denied if no labor contributed • 98% of households metered; consumers billed monthly by NWCPC	• Provides water to 68,000 • Metering reduces wasting of water • Tariffs collected successfully (approximately 91% of water sales revenues) • Households have access to two to three times more water • Time savings for women • Women more mobile and able to take part in other activities • Milk yields appear to have risen • Health appears to have improved
• Communities requested assistance from government • New projects requested by district development committees, the Ministry of Agriculture and Natural Resources, or DLVW • Communities contribute to construction	• Work with preexisting network of village committees (project committee, tap committee, health committee) • Provide institutional strengthening to committees • Use project staff experienced in community-based development techniques • Involve village leaders • Formal and informal staff training, training of health committee members • Work through volunteer community leaders for self-help activities (for example, construction) • Involve women, especially on health committees • Community (tap committees) responsible for maintenance; DLVW monitors and provides backup; project committee oversees tap committee	• Postplanning participation high, especially among women • Communities felt sense of ownership and pride in maintenance • The longer taps were in use, the more they became the exclusive water source for villages • Communities provided one-fifth of capital costs, two-thirds of O&M costs • Time savings • High participation of women in health and tap committees (fair in repair teams and low in project committees) • Water available at community taps 90% of the time; average repair time five days
• Government agencies chose sites based on degree of water need, size of population, accessibility of drilling equipment, groundwater characteristics of geologic formations • Community contributes to maintenance fund, provides manual labor, purchases cement • Maintenance program a prerequisite of installation	• Form or strengthen VDCs • Increase community organizational development through participation • Involve women • Use participatory training methodology; provide training to field agents, community, VDC members/officers, and maintenance and ORT volunteers • Develop training throughout life of project • VDC responsible for installation, O&M, organizing community for future development activities	• Clean water more accessible; communities using water for cooking and drinking • Time savings for women • Easier access to water led to women's and youths' income-generating activities • VDCs successfully mobilized communities for construction and maintenance • Latrine use high • Repairs carried out by community repairmen

(Table continues on the following page.)

Appendix 2. (continued)

Country (duration of project)	*Cost (population reached)*	*Institutional framework*	*Technology (choice)*	*Objectives*
Mali (1984–89)	$4.5 million (approximately 30,000)	• Direction Nationale de l'Hydraulique et de l'Energie (DNHE) • Ministry of Hydraulics and Energy • DANIDA	Boreholes with handpumps (No)	• Drill 150 successful boreholes in the Sikasso and Kadiolo areas, which have chronic water supply deficits • Provide workshop for boreholes • Train local personnel to eventually replace expatriates on the project
Haiti (1984–1989)	$6 million (160,000)	• CARE • National Potable Water Service • Local Water User's Association (CAEP) • USAID	Mainly spring-fed, gravity pipeline systems, standpipes, some reservoirs (Choice possible, if able to pay)	• Improve quality of life • Construct or rehabilitate rural potable water systems • Strengthen community institutions through establishing and training water associations for O&M • Educate users in water related sanitation
Yemen Arab Republic (1979–89)	$20 million (70,000–109,0000)	• Rural Water Supply Department (RWSD) • Local Cooperative Councils for Development (LCCDs) • New Transcentury Foundation (NTF) • USAID	Pumped water from wells, cisterns, springs to public and individual taps (Yes)	• Improve access to potable water for Yemen's rural population • Improve health and quality of life
Ecuador (1982–89)	$2.5 million (approximately 62,000)	• CARE-Ecuador • Ecuadorian Institute of Sanitary Works (IEOS) • Ministry of Health (MOH) • Provincial Councils of Azuay and Loja Provinces • CARE/Canada	Spring-source, gravity-fed systems; power pumped systems (rare); metered household connections; "pour-flush" latrines (No information)	• Provide improved access to water, sanitation, and health education in communities in two relatively poor areas in Andean highlands

Demand and its assessment	*Community participation and specific strategies*	*Success indicators*
• DNHE conducts survey; chooses village for installation; informs village of conditions • Village agrees to meet conditions; signs contract. Conditions: Village pays 250,000 F. CFA; forms water point committee; ensures cleanliness of installations; builds protective enclosure; pays cost of pump repairs	• Community contributes implementation funds • Village chooses two "repairmen" who inform project office of breakdowns • Community contributes to repair costs • Local blacksmiths to be recruited for maintenance in phase II; will be paid by community	• 91% of villages paid initial contribution • 10% pump failure rate • Cooperation with local authorities excellent • Maintenance systems functioning and sustainable • Low maintenance costs • Contributed to the overall improvement of water supply • System utilization satisfactory • Project in Sikasso 100% completed
• CARE notifies communities of project availability • Interested communities send letters of request • CARE reviews requests and coordinates with other local water projects • CAEP formed through local election • Communities required to provide volunteer labor (1 meter of trench per person); additional work reimbursed with food for work • Communities contribute local materials; O&M fees; land or right-of-way	• Communities elect CAEPs • CAEPs organize local labor groups • Food for work incentive not always successful (for example, delays in food payments cause work stoppage or discredit CAEP) • CAEP responsible for O&M; collect fees; establish bank accounts • Comité de Quartier (COQs) responsible for maintenance of individual standpipes; project design called for mostly women members • Provide training to CAEP, local plumbers • Women participate as community leaders, staff, and beneficiaries	• Quality of construction good • Performance of systems satisfactory; water quality high; water use increased • Approximately one-third of CAEP officers are women; two-thirds of COQ members are women; almost entire staff of user education department are women • Time savings for women used for childcare and education, agriculture, cottage industries • Democratization increased through electoral system for CAEP officers • CAEP removed ineffective COQ members • O&M satisfactory, repairs made (although role of Haitian national water association not clearly understood by those involved)
• Community and LCCD make project request to RWSD, *sheikhs* lobby RWSD for projects • RWSD assigns project to NTF • Community contributes funds, roughly one-third of costs	• Utilize existing local organizational system, (that is, LCCDs, *sheikhs*) • LCCD signs agreement with donors, NTF, RWSD • Local leaders (*sheikhs*) assist in surveys, avoiding disputes in pipeline placement • Four weeks classroom and on-the-job training for selected community members in O&M • Villagers contribute labor, local materials, portion of cost • Community responsible for distribution system, O&M	• Completed systems 2 1/2 years ahead of schedule • Community satisfied with system • 180 persons from 90 villages received O&M training • No examples of nonparticipation by villagers • Community pride in system • System caretakers treated with respect • Monthly fees collected from each household used for O&M, paying caretaker's monthly stipend • Repairs, major and minor, handled by community; hire private mechanics for major repairs
• Community interest and willingness to contribute • Each household must build latrine before new water system handed over to community	• Communities contribute labor and local materials • Communities establish water committees to coordinate construction and O&M • Use *mingas* (traditional communal work-gangs) • CARE meets with community representatives, IEOS, to coordinate project • Form consortium of water committees • Team of operators must include one woman • Provide training for system operators • CARE employs women as project staff • Water committees responsible for O&M; IEOS monitoring	• Systems function reliably • Quantity good; quality questionable • Designs are appropriate • 37% of communities had women on water committees • Decrease in diarrhea reported in children • Fees collected, systems maintained • Pour-flush toilets well constructed and maintained

(Table continues on the following page.)

Appendix 2. (continued)

Country (duration of project)	*Cost (population reached)*	*Institutional framework*	*Technology (choice)*	*Objectives*
Rwanda (1984–89)	No information (No information)	• CARE/Rwanda • Communal Centers for Continuing Education and Development • Community level management organizations • Ministry of Public Works and Energy • CARE	Capped springs, gravity systems, communal standpipes (No information)	• Construct reliable water systems • Develop functional, self-managing water user associations for sustained operation and management of new water systems
Malawi (1968–78)	No information (668,000)	• Ministry of Community Development • Christian Service Committee	Gravity-fed, community taps (No information)	• Bring abundant and clean water from mountains to communities at base and in surrounding plains
Peru (1983–86)	$766,114 (17 communities)	• Catholic Relief Services (CRS) • Community Development Institute (Instituto de Desarrollo Communal) • Institute for Rural Promotion (Instituto Animacion Campesina) • Development Corporation of Piura (a public service corporation)	Communal standpipes, individual connections (Yes)	• To provide water and sanitation services to communities affected by floods in the north (N) and drought in the south (S)
India (No information –1986)	$1.04 million (approximately 140,000)	• Social Work and Research Center (SWRC) (an NGO) • People's Action for Development, subagency of the Ministry of Rural Development • Swedish International Development Authority	Step wells with Persian wheels and handpumps (No information)	• Improve the physical and social conditions of Bicchiwada inhabitants, especially "scheduled" tribes and castes, by increasing agricultural production, educating groups in health and hygiene, and providing safe water and improved sanitation facilities

Demand and its assessment	*Community participation and specific strategies*	*Success indicators*
• Government-initiated project • Individuals donate part of small landholdings for construction of standpipe and yard • Community contributes labor	• Involve local political leaders throughout project, including project planning, financial management, and support for water committees • Community selects criteria for committee members; elects management, water point, user committees • Use local government meetings to disseminate water system information • Community pays flat fee; some individuals refused to pay because of distance from water source • Specific strategies to involve women, (for example, quotas for committee membership)	• Community expressed clear sense of ownership and responsibility for water system; felt confident in ability to sustain project • Facilities well maintained • Committees successful in collecting most fees • Community identified problems with payment of services; replaced ineffectual committee members • Women served on all committees • Some women held top positions, but majority were fee collectors • Time savings, but resulted in added work for women
• Projects initiated by government officials, and village headmen have significant role • Community must accept project and be willing to participate • Community elects committees • Community must provide proper aprons and soakaways before water connected from branchline to tap	• Project activities planned to ensure community participation • Community must accept project • Community participates in planning, construction, O&M • Community elects main project, branchline, and tap committees • Committees responsible for project construction and O&M • Community provides labor for construction and maintenance	• Community satisfied with water quality and quantity • Water easier to access • Community using piped water for drinking, cooking, bathing • Community labor accounted for about 25 to 30% of total construction and maintenance costs • Women's contribution recognized by community • Community feels project ownership
• Community need for water and sanitation improvement • Communities assume responsibility during design and construction, and for O&M	• Community and project holder signs contract • Organizational development for communities • Community participates in service level, site selection, management system • Community elects water committee • Community contributes labor, local materials, cash • Community organizes O&M committees (N) • Women participate in construction, elect and train health committees (N) • Involves community leaders • Community develops separate water-use monitoring committee (N)	• Community successfully organized work brigades • Water supply increased; quality relatively high, less expensive • Community organization strengthened • Home gardens resulted from increased water supply • Women gained confidence, assumed O&M responsibilities • Water-borne diseases decreased • Projects catalyst for new health and development activities • Water wastage low • Repairs completed (S)
• SWRC assessed villagers' development priorities and formulated project plan	• Most labor provided by project staff and any community labor paid for • SWRC trains village mechanics (men) in pump maintenance • Village committees form to handle O&M • Mechanics responsible to local village committees • Mechanics paid per repair or maintenance visit; responsible village committee confirms pump surveyed and maintained • Mechanics salary linked to job performance • SWRC initiates multisectoral development, (for example, income-generating activities, health education, tree nurseries, smokeless oven program) • Women have active role in health, income-generation, and smokeless oven programs	• 1,371 improved or new safe water supplies • Two years after construction, no wells had gone dry • During training, mechanics repaired government-installed pumps; all functioning at time of evaluation • Time savings for women • Guinea-worm prevalence reduced • Out-migration declined in target areas

(Table continues on the following page.)

Appendix 2. (continued)

Country (duration of project)	*Cost (population reached)*	*Institutional framework*	*Technology (choice)*	*Objectives*
Indonesia (1978–91)	$4.23 million (No information)	• CARE/Indonesia • Community Water Committees • CARE/USAID	Gravity-flow, piped-water systems, rainwater catchment tanks, and handpumps (No information)	• Reduce incidence of water-related diseases. • Provide adequate and reliable water system and sanitation facilities • Develop mechanisms for sustainable O&M • Improve community organization and management before construction • Maximize community inputs • Encourage communities to use credit to pay for systems and encourage banks to provide credit
Indonesia (1978–90)	$4.2 million (130,000+)	• CARE field offices • CARE International umbrella agreement with Ministry of Home Affairs • CARE/Indonesia formal partnership with provincial governments • Community water committees • Canadian International Development Agency	Gravity systems, hydraulic ram pumps, sand filtration, communal standpipes (No information)	• Provide proper water/sanitation system to relieve water-related diseases and reduce the amount of time women and children spend gathering water • Reduce CARE's direct village-level operational involvement and increase its catalytic role

Demand and its assessment	*Community participation and specific strategies*	*Success indicators*
• CARE selects potential community; conducts needs survey • If site meets selection criteria, CARE initiates training • Water scarcity, accessibility, and quality motivates community to participate • Community contributes cash, labor, local materials	• Community participation is a stated objective • Provide community training in organization and management, resource mobilization, system design, construction, O&M, financial management, sanitation and hygiene education • Work through community organizations and leaders • Active community participation in all levels, from planning to O&M • Use community problem-solving approach • Community water committees responsible for organizing and collecting community contributions	• Well-designed systems • Communities participated actively • Majority of communities successfully operate and maintain systems (some for up to 10 years); strength of local leadership most important factor in success • Women involved, but few in decisionmaking
• Communities make request to provincial planning ministry • CARE screens communities based on selection criteria • Community contributes cash, local materials, labor	• Community participates in all phases • Project involves community leaders (formal and informal) • Project meets with community, leaders, community organizations • Community forms water committee responsible for planning, O&M, management of health component • Project provides training for community and water and health committees in management, health, O&M • Local health committees deliver health messages • Incorporates community-initiated income-generation activities	• Project adaptable and strengthened community participation over life of the project • Very few design problems; simple, reliable design • Households pay for and construct latrines; latrine use high • Women involved in water committees (13% of membership) • Women actively involved in health committees (95% of membership) • Women satisfied with systems • CARE utilized women employees • Time savings for women used for help in agriculture and income-generating activities (sewing, embroidery, handicrafts) • Community motivated and capable regarding O&M; repairs made successfully • Community pays water fees, some 6 months to a year in advance • Public taps became village meeting places

(Table continues on the following page.)

Appendix 2. (continued)

Country (duration of project)	*Cost (population reached)*	*Institutional framework*	*Technology (choice)*	*Objectives*
Peru (1984–88)	$2.9 million (44,745)	• Departmental Development Corporations in La Libertad and Cajamarca departments • Department-level health units of MOH • CARE Canada/Peru • Canadian International Development Agency	Gravity flow, protected spring source, yard standpipes (No)	• To improve health of as many people as possible in rural mountainous areas of northern Peru • Construct and rehabilitate water systems, educate community members in maintenance and health issues, and form and support village water committees • Supply adequate amount of water to villages • Establish effective maintenance and repair system in each community • Introduce use of latrines in 50% of homes • Introduce personal hygiene and housecleaning • Use of oral rehydration therapy by 50% of mothers with children under 5 years • 50% of children receive vaccinations by age 1
Thailand (1966–72)	$4.8 million (600,000 to 1 million)	• Sanitary Engineering Division (SED), Thai Ministry of Public Health • U.S.-based engineering firm • USAID	Water treatment plant with storage tower and piped distribution system Public taps eventually changed to metered private connections. (No information)	• Help Thai government win loyalty of rural population in NE • Help develop government capacity to plan and administer a National Potable Water Program • Improve health in 600 "security sensitive" communities through provision of potable water

Demand and its assessment	*Community participation and specific strategies*	*Success indicators*
• Communities request water system • Communities donate land for water system • Communities provide local materials and labor • Evidence of community commitment is specific selection criteria • Community members who do not contribute labor excluded from water system	• Community provides labor and local materials • Community responsible for O&M • Most communities elect water committee to manage O&M • Counterpart provides training in O&M to many community members • CARE provides financial and institutional development support to counterparts • CARE provides tools for each water committee	• Increased use of potable water • Water quality and quantity improved • Communities exhibit pride in water systems • 98% of surveyed villages have water committees; 91% collect water fees • Overall quality of O&M high; water systems functioning in all evaluated villages, some systems for over 5 years • Communities have successfully made repairs
• District officials often initiate project; officials discuss proposed project with village chiefs and villagers • Amount of community financial contribution or self-help significant factor in selection *Community should:* • Have existing but not potable water supply • Be readily accessible by road • Have high interest in obtaining system and contribute to construction • Be willing to develop rate structure for O&M and future expansion	• Community chooses community member as plant operator • SED provides 5 weeks' on-the-job training to operators; provides refresher training • SED provides monthly supervision • Plant and distribution system turned over to local government for O&M • Community develops rate structure • Operator responsible for system operation and fee collection	• Most systems functioning effectively more than 10 years after construction • Most systems financially self-sufficient • Time savings and increased water use yield economic benefits (increased gardening, more craft activities, and animal raising) *Successful systems had:* • Initial community contribution of time, labor, funds • Training and support for local operators • Gradual evolution of viable rate structures *Problems:* • Some users not drinking water • To cover O&M costs communities changed to metered, private taps; poorer villagers lost access to water system

Appendix 3. Summary of Differences between Blueprint and Learning Process Approaches

Issue	*Blueprint approach*	*Learning process approach*
Purpose	For large-scale construction projects	For institutional reform and demand-based approaches
Role of government	Provide services	Create policy framework to facilitate and initiate beneficiary and stakeholder involvement
Role of people/users	Peripheral; pay utility charges	Central; take initiative, learn; problem solve; process facilitated by "external" agents, as needed
Project documents	Detailed, accurate masterplans essential for success; technology choice and service levels predetermined	Broad guidelines; detailed plans produced at community level; no master plans but clear working goals, strategies; monitoring and evaluation criteria essential
Role of managers	Manage construction activities	Manage unpredictability by creating a problem-solving environment
Personal evaluation criteria	Construction completed, adherence to schedules, unit costs	Primarily promotion of local reliance
Role of data	Extensive physical, economic data base before implementation by experts	Limited data collection before implementation, including cultural and social data; continued throughout by community people and project staff
Role of evaluation	Primarily a terminal entity; conducted by external experts	Ongoing evaluation by community people and project staff
Indicators of success	Quality and quantity of construction; unit costs	Effective use of facilities, sustainability, empowerment
Interagency collaboration	Consultations needed; collaboration during implementation not essential	Working collaboration essential for achieving indicators of success

Source: Adapted from Korten (1980).

Appendix 4. Centre for Social Research: Indicators for Sociological Monitoring System—Karonga Lakeshore Integrated Rural Groundwater Supply Project

Indicator	*Purpose of indicator*	*Specifications*	*Data needs*	*Timeframe*
Community institutions: proportion of communities with VWHC, PC, and PAs in place and functioning	To ensure that village-level structures are in place and operating	Numbers, composition when established, meetings held	• AAC reports on new elections • SME 91/92 • MA monthly records • CDA visits • VWHC/PC records • Extension worker reports	Ongoing Reviewed every 2 months
Degree to which committees are representative of all sectors of the community	To ensure that communities will support the established structures; to indicate where training, mobilization, and elections are required	• Gender • Traditional authority • Other power/influence • Elected/coopted • Method and frequency of communication	• SME 91/92 • MA monthly records • CDA visits • Training records	Ongoing
Proportion of committees that understand their responsibilities in relation to VLOM	To identify training needs and need for institution building	Responsibilities of each linkages training received	• Training records and follow up • SME 91/92 • MA monthly records • CDA visits • VWHC/PC records	Ongoing
Proportion of communities that have established a viable O&M revolving fund	To identify needs for training, community mobilization and support	Ability to pay; type of arrangements: • Collection mechanisms • Accounting procedures • Defaulters • Number of users per pump • Time lapse for repair	• SME 91/92 • MA records • CDA visits • Training records • VWHC/PC records	Ongoing
Degree to which communities understand and accept their role in VLOM	To identify needs for training, support and mobilization	• Communication with communities • Community understanding of VLOM • Acceptance of level of financial contribution	• VWHC/PC records • User interviews • MA records • CA visits • Extension worker reports • SME 91/92	Ongoing; especially crucial in year one

Note: Abbreviations used in this appendix are as follows: CDA = community development assistant; FHH = female-headed household; MA = maintenance assistant; O&M = operations and maintenance; PA = pump attendant; PC = pump committee; SME = sociological monitoring exercise; VLOM = village-level operation and maintenance; VWHC = village water and health committee.
Source: Gaynor and Jespersen (1992).

Notes

1. The gender issue was also addressed in the analysis, but because of the importance and complexity of the findings, that subject will be examined in depth in a separate paper.

2. All dollar amounts are U.S. dollars.

3. Pearson-product moment correlation measures the strength of linear association between two variables and ranges from –1 to +1. A zero correlation between two variables means that they have no linear relationship. A higher, positive number means that one value is likely to have a high value when the other one does, because the two are positively associated. Association does not, of course, imply causation.

4. Multivariate regression is a statistical method of determining the percentage of variance in the dependent variable that is explained by a combination of independent variables, or by any one variable, after controlling for the effects of other independent variables.

5. The variable reduction mostly involved eliminating those variables with few observations or unreliable estimates, or those that were collinear. As seen in chapter 4, inclusion of variables was, if anything, overly generous.

6. To reduce the number of performance variables to be studied, a factor analysis was run for twenty performance outcomes. Overall project effectiveness emerged as the principal factor, accounted for the greatest variance (73 percent), and had the highest factor loading (0.98) of the twenty variables. The relative importance of overall project effectiveness justified its use in this study as the main indicator of performance.

7. The many measures of participation form a cluster, as supported by the high correlations among the measures (0.7–0.85) as well as by a factor analysis performed on nine of the participation variables with fewer than ten missing data. Overall beneficiary participation emerged as the principle factor, which explained 72 percent of the variance. It had a factor loading of 0.97.

8. For cross-tabulation, the cardinal scale of 1 to 7 was converted into low: 1–3; medium: 4–5; and high: 6–7.

9. The chi-square test of independence of the two variables based on the two-way classification in figure 4.2 gives a value of 64, which easily rejects the null hypothesis of independence, since the critical value of the test at the 1 percent significance level is 13.3.

10. Although the coefficient from a linear regression is not directly comparable to a familiar correlation coefficient (rho), the results of a bivariate regression give nearly the same results as simple correlations when the dependent and independent variables have nearly the same variance. In table 4.1 the regression coefficients are reported so that the bivariate and multivariate results are comparable.

11. The value of a *t*-statistic reveals the likelihood that, given the precision of the estimate, an estimate of the value observed could have resulted by pure chance even if the true value of the coefficient being estimated were zero. The results of hypothesis testing are generally expressed in two ways. A significance level (most commonly 5 percent or 1 percent) and the computed value of the *t*-statistic can be compared to the "critical value" for that significance level; for instance, for a large number of observations the critical value for the 5 (or 1) percent level of the *t*-test is 1.96 (2.57). The other use of a *t*-statistic is to calculate the significance level at which a given *t*-statistic would reject the hypothesis of a zero coefficient (this is referred to as a *p*-level). For instance *t*-statistic values of 2, 3, or 5 are said by the first method to "reject the null hypothesis at the 5 percent level"; the *p*-level, or the significance level at which the three statistics (for 121 observations) could reject the hypothesis, reveals very different levels of rejection: 0.047, 0.003, and 0.000002.

12. A simple exposition in equations may be helpful. The basic regression is between an outcome, or perfor-

mance, variable as the dependent variable (*OPE*), participation (*OBP*), a set of direct participation determinants (call them *Z*), and a set of direct/indirect determinants (call them *W*). The regression is:

$$OPE_i = \alpha + \beta * OBP_i \gamma * Z_i + \delta * W_i \varepsilon_i.$$

The columns of table 4.1 report the partial correlation coefficient b on participation, with various sets of the *Z* and *W* variables. The major distinction between the *Z* and *W* variables is that variables in *W* may also affect performance through participation, or participation may affect these factors.

13. The basic result from multivariate econometrics is that the exclusion from a multivariate regression of a variable that is both positively related to the outcome (dependent) variable and an independent variable results in an upward bias on the estimated coefficient of the included variable. Intuitively, the regression attributes (falsely) to the included variable some of the outcome associated with the excluded variable.

14. The variables expressed as percentages are rescaled to 1 to 7 points so that the partial correlation coefficients are comparable across variables.

15. The correlation between project effectiveness and overall water-system sustainability was high at 0.88; accordingly, results for sustainability will not be reported separately.

16. The results of the other determinants are much less strong than for project outcomes. Other variables—namely, local social and cultural conduciveness, economic context, and understanding between agencies—were more important than the direct determinants.

17. The question was specifically related to participation; hence the correlation is very high and the variable is not independent.

18. Some experimentation with using the coders' subjective assessments of the coding reliability on a project-by-project basis as weights revealed no significant differences in the results.

19. The basic result is that with random-measurement error, a regression coefficient is *attenuated*, that is, biased toward zero. In the simple bivariate case, the amount of the bias is the ratio of variance of the measurement error to the total observed variance of the independent variable.

20. Of course, with hindsight it is clear that having one coder code the outputs without knowing the purpose of the data would have produced even stronger protection from a halo effect.

21. It should be noted that this result is also consistent with certain mixes of measurement error (with a downward bias) and halo effect (with an upward bias) that just offset each other.

22. The issue of establishing causation from data is discussed more fully in Isham, Narayan, and Pritchett (1994), who use statistical estimation techniques appropriate to identifying structural relationships. Those econometric results, which are beyond the scope of this paper, fully support a causal relationship.

23. Since the average number of users was based on design criteria, large piped systems received high scores. These may be multicommunity systems with pumping stations or gravity-fed systems. Just as complexity contributes negatively, a negative correlation exists also between overall effectiveness and the largest water systems.

24. The last finding, a significant negative relationship between project complexity and quality of project design, is important. One of the main arguments justifying investment in improved water supply is health improvement. Studies done in the last decade establish that health impacts are maximized when water improvements are combined with sanitation facilities (toilets) and health education. Hence most water projects try to combine these three elements in integrated projects. While some projects have been able to complete all three activities successfully, the fact that in most countries different government ministries have responsibility for these activities makes successful implementation difficult. Given the difficulty in changing the fundamental approach in the sector from a supply to a demand approach, it is important to sequence activities carefully. Only after successful completion of one activity should additional activities be undertaken. In most rural communities, this would mean water first, sanitation later.

25. Based on her in-depth analysis of 480 handpumps in Zimbabwe, Cleaver concluded that three-tier maintenance was more myth than reality. She identified four prerequisites for effective community participation in the long-term maintenance of pumps in Zimbabwe:

- A strong felt need for a protected water supply
- Knowledge that government will not provide significant maintenance support
- A strong, well-motivated local leader
- The anticipation of some tangible reward.

26. The Swiss agency Helvetas undertook a twenty-five-year retrospective analysis of its assistance to Cameroon, during which 114 piped-water systems had been built. Findings revealed a very similar pattern. The study found a steady increase in total costs, steady decline in village contributions, and a very poor maintenance record, despite the presence of project-trained caretakers for 95 percent of the water systems.

Maintenance was supposed to be handled by caretakers chosen, employed, and paid by villagers. However, out of 105 caretakers, only 34 were regularly compensated for their work. Fifty-eight received no compensation, and 19 received compensation rarely or irregularly, sometimes in the form of a bottle of beer. Not surprisingly, the lack of compensation and the lack of community interest in routine maintenance when water was still flowing made caretakers quickly lose interest in their work. The villagers, who did not feel any responsibility for a system financed and maintained by outside agents, had no interest in organizing to undertake maintenance.

27. Similarly, studies of nineteen small piped-water systems in Andhra Pradesh, India, illustrated the difficulty in generating and collecting payment for public standposts, but the willingness of communities to pay

for higher service levels. Despite regulations against private connections, the study found that 20 percent of the people had connected illegally to the pipe system, which severely hurt both revenue collection by the local councils and water flow at public standposts and at the villages at the very end of the system. The same study postulated that if house connections were allowed, not only would the revenue base of local councils be sounder but the communities themselves would want to take over the systems from the local councils, get involved in management, and raise the revenue to expand the distribution network of the pipe systems (PRED Study Team 1991; and Job and Shastry 1991).

28. In a community water project in Indonesia, a project manager reported that, at the beginning, field workers' diaries reflected no mention of women and poor people. Field workers stayed with the chief and "hung out" with village officials. After being repeatedly queried and told that they were not doing their jobs, field workers gradually started spending more time with women and the poor and reported being less embarrassed at doing so. From these early experiences the project developed simple criteria to monitor the participatory process, including the number of women who showed up, spoke up, or challenged what was said at meetings. Over one year, leadership of the water groups shifted from village leaders to others who had not previously held leadership positions.

29. Greater autonomy is also, not surprisingly, strongly associated with greater local control (see table 5.3).

30. A training exercise has been developed for use in workshops with task managers and sector and WID (women in development) specialists in the World Bank. It applies a participation matrix to analyze the demand orientation of eight design features of a rural water supply project supported by the Bank. The case study is hypothetical, but it is based on Bank experiences, particularly in Asia. For more detailed information on use of the material, see Workshop Facilitator Notes, "Participatory Design of Demand-Driven Water Projects," Human Resources and Social Development Division, Asia Technical Department; and UNDP-World Bank Water and Sanitation Division, Transportation, Water and Urban Development Department, World Bank, Washington, D.C., 1993.

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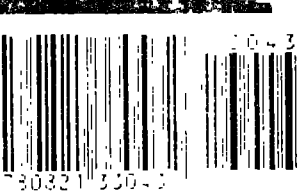

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