Rural Infrastructure from a World Bank Perspective

A Knowledge Management Framework

Louis Y. Pouliquen
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The World Bank
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Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreword</td>
<td>v</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>vi</td>
</tr>
<tr>
<td>Executive Summary</td>
<td>1</td>
</tr>
<tr>
<td>Chapter 1 Introduction</td>
<td>6</td>
</tr>
<tr>
<td><strong>Purpose of the Review</strong></td>
<td>7</td>
</tr>
<tr>
<td><strong>Scope of the Review</strong></td>
<td>7</td>
</tr>
<tr>
<td><strong>Data Bases</strong></td>
<td>8</td>
</tr>
<tr>
<td><strong>Organization of the Volume</strong></td>
<td>8</td>
</tr>
<tr>
<td>Chapter 2 The World Bank's Lending Record</td>
<td>10</td>
</tr>
<tr>
<td><strong>Sectoral Breakdown</strong></td>
<td>10</td>
</tr>
<tr>
<td><strong>Regional Breakdown</strong></td>
<td>11</td>
</tr>
<tr>
<td><strong>Trends</strong></td>
<td>11</td>
</tr>
<tr>
<td><strong>Achievements</strong></td>
<td>16</td>
</tr>
<tr>
<td><strong>Conclusions</strong></td>
<td>21</td>
</tr>
<tr>
<td>Chapter 3 Decentralization Is Necessary</td>
<td>24</td>
</tr>
<tr>
<td><strong>Deconcentration versus Devolution</strong></td>
<td>25</td>
</tr>
<tr>
<td><strong>Balance</strong></td>
<td>25</td>
</tr>
<tr>
<td><strong>Depth of Decentralization</strong></td>
<td>27</td>
</tr>
<tr>
<td><strong>Decentralization Must Be Carefully Crafted</strong></td>
<td>29</td>
</tr>
<tr>
<td>Chapter 4 Social Capital, Accountability, and Commitment</td>
<td>31</td>
</tr>
<tr>
<td><strong>Social Capital</strong></td>
<td>31</td>
</tr>
<tr>
<td><strong>Increasing Beneficiaries' Commitment</strong></td>
<td>32</td>
</tr>
<tr>
<td><strong>Improving Agency Commitment</strong></td>
<td>34</td>
</tr>
<tr>
<td><strong>Strengthening Interaction between Beneficiaries and Agencies</strong></td>
<td>37</td>
</tr>
<tr>
<td><strong>Policy Consistency and Continuity</strong></td>
<td>39</td>
</tr>
<tr>
<td><strong>Change Process</strong></td>
<td>40</td>
</tr>
</tbody>
</table>
Chapter 5  Rural Infrastructure and Poverty  43
  Poverty Alleviation through Rural Infrastructure Is Not Automatic  43
  Approaches to Poverty Alleviation  44

Chapter 6  Economic And Financial Issues  48
  Cross-Sectoral Priorities  49
  Heavy Reliance on Beneficiaries’ Preferences  49
  Cost Sharing  50
  Giving Beneficiaries a Choice  52
  Good Information  53
  Financial Replicability  53

Appendixes
  1  Notes on the Database  55
  2  Rural Infrastructure in World Bank Lending  57

Boxes
  1  Bangladesh road network classification and composition  24
  2  Privileged, intermediate, and latent groups  28
  3  Rural Electrification Cooperatives  36

Figures
  1  Lending by sector, cumulative fiscal 1972–96  10
  2  Lending by region, cumulative fiscal 1970–96  11
  3  Volume of lending by fiscal year as a function of share of rural infrastructure component in total project cost  12
  A2.1  World Bank lending, by number of projects, 1970–96  57
  A2.2  World Bank lending, by commitments, 1970–96  57
  A2.3  Number of Bank operations with rural infrastructure, 1970–96  58

Tables
  1  Trend in number of projects  12
  2  Dominant types of infrastructure  13
  3  Objectives of rural infrastructure component  14
  4  Financial objectives in selected fiscal year periods, 1974–96  14
  5  Decentralization objectives  15
  6  Technical objectives  16
  7  Physical achievements  18
  8  Physical achievement by sector, fiscal 1984–86  19
  9  Sustainability ratings of projects, fiscal 1984–86  20
  10  Sustainability by sector, fiscal 1984–96  20
  11  Decentralization objective  25
  12  Responsibility by level of government and beneficiaries  27
  13  Average beneficiaries’ contribution to investment cost  33
  14  Number of projects with financial contributions from various sources  51
  15  Pricing  52
Globalization and global interdependence are the themes most dominant in our economic system as we approach the twenty-first century. They are the context within which increases in food requirements will have to be addressed. At the birth of the new millennium there will be 6 billion people to feed, and by mid-century there will be at least half as many more. In addition expected higher living standards will create demand for more food per capita than today.

This expansion in food requirements cannot possibly be met through agricultural policies that rely on price support and agricultural trade protectionism or even on solely improving agricultural productivity.

Agricultural production, and thus rural development, has to become an integrated part of the global environment. Agricultural policies must work toward making rural areas more competitive, not isolating them from the global economy. The importance of infrastructure in this regard is crucial. Farmers are unable to compete in growing markets without viable infrastructure, and food marketers cannot expand sales outside urban centers without improved infrastructure. Today some 15 percent of crops are lost due to lack of infrastructure and appropriate storage facilities alone. For rural residents to be participating stakeholders in trade liberalization and globalized markets, they need to be able to share in the benefits of market access, technological advances, and industrialization. In addition, from agricultural processing to nonfarm industries, rural enterprises need to be expanded. Here again, basic infrastructure is the technological backbone that permits off-farm wealth to be created in rural communities, and enables businesses to operate outside major urban centers.

In the past, many rural areas have been left behind or left out due to the lack of modern physical infrastructure, particularly outside the immediate vicinity of high-density urban centers. We must correct this failure. But, to do so, we have a lot to learn about how best to plan, finance, build, operate, and maintain rural infrastructure, which is mostly local, small-scale, and community based. This volume provides a framework for initiating this learning process.
Acknowledgments

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They also include all those, many of whom are former colleagues, whose dedication to “making rural infrastructure work” is so obvious in many of the projects I reviewed. It is thanks to their hard work, prodding minds, willingness to innovate, and professional experience that we have the rich array of projects upon which the present lessons are based.

Finally, I would like to make special mention of Ismail Serageldin and Akin L. Mabogunje. My thanks to Ismail go far beyond providing the budgetary support that made this volume possible. More importantly, he generated the intellectual climate and intellectual stimulation without which my last few years on the staff of the World Bank would not have been nearly as rewarding as they turned out to be. Professor Mabogunje helped me discover, many years before institutional economics became a household phrase, the difference between “organizations” and “institutions” and the importance of informal institutions, two concepts central to this monograph. This volume was edited by Alison Raphael and desktopped by Gaudencio Dizon.
Executive Summary

This volume is intended to serve as a basis for knowledge management on rural infrastructure. If it is to be effective, knowledge accumulation must start from an up-to-date assessment of the "state of the art," and be organized around a framework that makes it possible to translate new experience with what does and does not work into lessons that can be added to the state of the art. The volume attempts to develop such a framework on the basis of a review of World Bank experience with rural infrastructure lending and the literature on topics directly or indirectly related to the subject. Its aim is to provide a starting point. How quickly it becomes obsolete and requires upgrading will be a test of the vitality of the Bank's learning process.

Bank Lending for Rural Infrastructure

An inventory of Bank operations, the first building block of the volume, counted some 800 projects with rural infrastructure (RI) components worth some US$40 billion in 1996 dollars. Against the backdrop of this sizable amount of lending, the review focused on three three-year periods, at ten-year intervals. The first period, fiscal 1974–76, came in the wake of the 1972 Nairobi World Bank Annual Meetings, which put rural poverty at the center of the Bank's agenda and led to a stream of lending for integrated rural development. The next period, fiscal 1984–86, was a turning point not only because of disillusionment with integrated rural development, but also because of serious questions about the implicit central planning frame of mind on which it rested. The last period, fiscal 1994–96, is the most recent from which we can draw and is rich in new approaches, particularly with regard to participation and social policies.

The following trends emerge from this review of Bank RI lending during the three periods examined:

- While substantial, lending for RI has been extremely dispersed and lacking in focus. For two-thirds of the 185 projects financed in fiscal 1974–76 and 1984–86, the RI component accounted for less than 20 percent of total project cost. At this low level it typically received little attention and seldom addressed policy issues. The focus was almost exclusively on physical objectives, which were largely achieved.
- Physical targets were, in fact, often exceeded. During fiscal 1984–86 fewer than 15 percent of the projects with RI components greater than 20 percent of total project cost (referred to as "significant" projects) did not reach their goal, while more than twice as many (35 percent) exceeded it. But the story is quite different with regard to the sustainability of these investments.
- Sustainability is a major challenge. For fiscal 1984–86, almost one-half of the RI components of significant projects were unlikely to be sustainable.
• The jury is still out on whether more recent projects will fare any better, but their design is very different from that of the earlier generation of projects, and many of them try to come to grips with the policy issues that have plagued their predecessors.

• Most noticeable among the new trends is a dramatic increase in focus. The number of projects in which RI is addressed seriously (roughly corresponding to the number of significant projects) has increased from the one-third mentioned above to three-quarters in fiscal 1994–96. Within this group the percentage of projects that does not state reasonably clear RI objectives dropped from 70 percent to about 10 percent.

• Far more attention is now being given to policy issues directly related to sustainability; specifically, beneficiary participation, decentralization, and financing.

• While improvements are occurring at a rapid pace, there is, nevertheless, still some way to go. On average, for fiscal 1994–96, only about one project in five contained a convincing treatment of decentralization issues, and, while one project in four addressed financing issues (compared with none in the preceding periods), they were limited to a description of the existing financing mechanism.

• Another significant facet of the recent trend has been a shift from medium- to small-size investments, typically at the village, rather than regional, level. The share of small investments has more than tripled between fiscal 1974–76 and 1994–96.

Institutional Issues

Turning from trends to project content and design, the main lesson that emerges from the review is that there are no blueprints for success. For every example of what worked, there are counterexamples of failure; the converse is also true—what did not work somewhere worked very well elsewhere. We must therefore look not for blueprints but for principles. Most of the principles that the review identified are related to institutions, in the broad sense given to the term in institutional economics; that is, to use Douglass North's words: "Any form of constraint that human beings devise to shape human interaction." More important, and probably the main reason why it is so difficult to identify blueprints, is the fact that many of these institutional issues relate to informal constraints, deeply anchored in local traditions and culture. The review focused on one aspect of formal institutional constraints, namely decentralization issues, and on a variety of practices used to address informal constraints. It also focused on approaches that are not widely used but which, according to institutional economics literature and related topics, ought to be worth pursuing. Most of these are related to the process involved in the change from one institutional form to another.

Decentralization

In relation to rural infrastructure, decentralization is not a matter of ideology but of necessity. With some exceptions, RI investments are typically too small and dispersed to be dealt with from the center. Some form of decentralization, ranging from delegation of responsibility to a local branch of a central agency (deconcentration) to empowerment of local communities (devolution), is therefore unavoidable. The main principles emerging from the review are:

• There is no evidence that one form of decentralization should systematically be preferred to over another. While the current trend in lending is toward devolution, rural energy projects, which often rely heavily on a deconcentration approach, are currently the most promising from the sustainability point of view.

• Achieving a balance between the political, fiscal, and administrative aspects of decentralization is essential, as is acknowledging that these three facets of decentralization cannot be seen in the isolated context of rural infrastructure, but rather must be re-
lated to the overall policy on the role of local government.

- The degree of decentralization should not be the same for all types of RI investments: small, rural water schemes lend themselves to extensive devolution of responsibility to local communities, while collective action theory suggests that the responsibility for rural roads serving a number of communities should be handled at a more global level.
- The degree of decentralization need not be the same for all facets of the investment process: investment choice can be highly decentralized, while financing can remain much more centralized.
- Institutional changes related to decentralization, like all institutional changes, should be viewed as an evolving process, not a one-time search for a magic solution.
- All successful decentralization initiatives paid tremendous attention to detail in all facets and phases of the process.

Informal Institutions

With regard to informal institutional issues, lessons from project experience all point to the need to increase commitment and accountability. Current projects focus on beneficiary commitment, while earlier ones concentrated on commitment from the implementing agency. However, this should not be an either/or choice. The rural energy projects mentioned above concentrated on power companies' commitment to rural electrification rather than to beneficiaries, and were very successful. Attempts at securing beneficiary commitment cover a wide variety of approaches, from vague and often meaningless consultations to full empowerment of beneficiaries. The trend is toward empowerment. The link between participation and sustainability has not yet been firmly proven, but all indications are that participation will have a significant impact. This is particularly true of the most recent projects, which require beneficiaries to back up their choices with substantial financial contributions of 25 to 40 percent of investment cost.

Change Process and Other Issues

In addition to the above conclusions, the literature review points to a number of additional issues that have received relatively little explicit attention in project design. However, the strength of the case made in the literature, as well as whatever implicit evidence emerges from project experience, suggests that the following issues deserve careful attention. Except for the first two points, they are directly or indirectly related to the process involved in the shift from one institutional form to another.

- Strengthening all forms of user associations may contribute to giving more "voice" (Hirshman's terminology) to beneficiaries in putting pressure on agencies responsible for providing rural infrastructure.
- An essential element of the above would be to rethink the use of monitoring and evaluation indicators, and turning them from audit and control tools into "voice enhancing" tools.
- A premium should be placed on the consistency and continuity of rural infrastructure policies. Hard-earned achievements and attitude changes can be undermined or destroyed very quickly by conflicting signals from different agencies or erratic policy changes over time.
- As a corollary of the above, change should be conceived as a gradual process rather than a radical reform.
- In trying to assess the sustainability of future investments, more weight should be put on past track records than on promises of future changes.
- It is important to create awareness that capacity building takes a long time, and that short-term consultant input alone is unlikely to have a lasting impact or to substitute for a functioning national support system.
Poverty

Because rural areas often have very high levels of poverty, rural infrastructure should help the poor. Earlier projects seldom went beyond this observation, and often assumed that if RI projects concentrated on the poorest regions, they would automatically help reach poverty-alleviation objectives. This may indeed be the case, but more recent projects often try to go one step further and target the poorest among the poor. Achieving this more ambitious objective is neither automatic nor trivial. The most widely used approaches to poverty alleviation are mentioned below, but the list is short, suggesting that its link with investments in RI is a topic requiring further research.

- Concentrate investments in the poorest regions.
- Use RI investments as a tool to create local employment. This is normally accomplished by a heavy reliance on labor-intensive construction methods and, in contrast with earlier projects, current projects tend to pay for labor, rather than treating it as a community contribution. Wage level is a key issue.
- Where the cost of rural infrastructure is recovered from the beneficiaries, consider differential pricing for the poor.
- Give more voice to the poor by increasing their empowerment in the decisionmaking process. This, however, is more easily said than done and is, at this stage, an approach that remains to be explored.

Economic and Financial Issues

On the economics of rural infrastructure, the review reached one anticipated conclusion and one that was slightly less expected. The anticipated conclusion was that there is no obvious or convincing method of economic analysis to determine how much should be invested in RI, in which sector, or where. Classical cost-benefit models can only contribute to the optimization of design standards, particularly when the services provided by the infrastructure are in the nature of a public good and difficult to subject to a willingness-to-pay test (for example, roads). More advanced models relying on econometric analysis are more promising, but they are extremely complex to formulate and require extensive data. They badly deserve more attention but, at this stage, can be considered only experimental. The less-expected finding was that there is relatively little concern about the balance or sequencing of investments in different types of rural infrastructure. There are no operations stemming from an urge to correct perceived imbalances and no theoretical analyses showing this to be an issue. From an operational point of view this conclusion opens the door to a sector-by-sector approach, where such an approach might be appropriate on institutional grounds.

The absence of convincing economic models for analyzing RI investments implies a heavy reliance on beneficiary choices. But the quality of the decisionmaking process at the local level should not be idealized or even taken for granted. It needs to be supported by effective dissemination of information, and there are many ways to accomplish this in addition to—or in lieu of—traditional government channels. Nongovernmental organizations (NGOs) can play a major role, as can direct sharing of experience between beneficiary communities. Equally important, community choices should not be distorted directly by limiting them to specific investments or design standards, or indirectly through explicit or implied subsidies. Requiring significant, up-front financial contribution to investment cost seems to be a cornerstone of the most recent approaches and has the merit of forcing communities to take the choices available to them very seriously.

On the financial front availability of resources to pay for recurrent costs and the replication of pilot schemes are the two critical issues. There are no magic solutions, but increased reliance on community self-financing should be of major help, particularly with re-
gard to replicability. Not enough evidence is available yet of the impact this will have on recurrent cost financing, but past experience suggests that it should not be taken for granted and is likely to be strongly related to the policy continuity issue mentioned above.

Notes

1. Unless stated otherwise, all dollar amounts in this volume are in current U.S. dollars.
CHAPTER 1

Introduction

Rural infrastructure is critical to both economic and social development. Its absence thwarts growth, and typically the poor are hurt the most. The World Bank sector strategy, Rural Development: From Vision to Action, makes the economic case forcefully:

When there are adequate communications networks, roads, storage facilities, and electricity, farmers can obtain the information they need to grow the most profitable crops, store them, move them to market, and receive the best prices for them. Today, up to 15 percent of production is lost between the farm gate and the consumer because of poor roads and storage facilities—reducing incomes to farmers and raising costs to urban consumers. As cities grow, the need for infrastructure becomes all the more important.¹

The links are either direct or indirect. Lower production costs lead to higher agricultural output and higher incomes for rural populations. But better infrastructure also leads to changes in attitudes that may have even more important long-term impacts on rural development. For example, in commenting on the very limited treatment received by rural infrastructure in the 1994 World Development Report² on infrastructure, Raisudin Ahmed wrote:

The most profound effect of infrastructural development could be on the attitude and values of rural households, even though such changes are the least visible to casual observers. Development of transport and communication infrastructure enhances the mobility of people and information through reduction in cost and time. The resulting increase in interaction with the outside world and the informal education process that such interactions involve contribute to changes in attitude and human capital development. The effects of these attitudinal changes are reflected in the increasing adoption of family planning practices... diminishing faith in superstition, increasing preference for consumer goods produced outside...³

The economic and social importance of rural infrastructure has not been matched by the attention it receives. The rural development sector strategy paper also points out that in most countries RI has received very little attention, forming a serious impediment to rural development. While existing statistics on the availability of RI are poor, they indicate that some 40 percent of the rural population of developing countries lacks access to water, and 60 percent has no access to sanitation. In Africa no more than 8 percent of the rural population has electricity connections. Lack of access is not
only a major hardship for the population at large, but disproportionately affects the poor—women and children in particular. The situation described below refers to the transport sector in Africa, but it reflects a common occurrence elsewhere in the world and outside the transport sector:

The typical transport vessel in rural Africa is a woman. Household surveys show that 87 percent of trips in rural Africa take place on foot and that women account for more than 65 percent of the household time and effort spent on transport. In survey areas, the daily transport effort of a typical adult female was equivalent to carrying a load of 20 kilograms for 1.4 to 5.3 kilometers. No matter how strong the body, the sheer exertion of primitive transport has an unhealthy effect.4

**Purpose of the Review**

The purpose of this paper is to take stock of the state of the current thinking on rural infrastructure issues. It is based on an evaluation of the Bank's operations with an RI component, as well as a literature review on topics directly or indirectly related to the subject. Each of these two components proved to be a challenge, for almost the opposite reasons. Bank operations have changed dramatically from the early days of RI lending; recent operations are much more focused on key policy issues. It is from these operations that we would most like to learn from experience, but most of them are still at the implementation stage. There is therefore a relative paucity of hard facts about recent Bank operations from which to draw firm conclusions. At the other end of the spectrum, the relevant literature is all but boundless, reflecting the all-encompassing nature of rural infrastructure. Almost all disciplines are relevant, and the problem is an excess of material.

As a result this review should be read with modest expectations and considered to be the starting point of a collective learning effort. The importance of such an effort cannot be overstated. As the paper will point out, there are no clear blueprints for success, largely because success seems to depend so much on human factors that we do not understand well. We have a large repertory of successes and failures, but it is difficult to distinguish between the principles that explain these successes and failures and the case-specific factors that condition the outcome of individual operations. We must accumulate evidence until the common threads emerge. This requires a continuous effort to record and analyze the lessons from experience as they unfold, and patterns emerge clearly. It can hardly be done within the context of a single study, but rather should be a global long-term effort with the participation of all those who have contributions to make. The cross-fertilization of ideas this entails is already taking place within specific sectors (water, roads, electricity), but is less advanced on issues that cut across sectors. This is the area in which this review hopes to contribute, and upon which the most work remains to be done.

**Scope of the Review**

In addition to its limitation in content, this paper has at least two limitations in scope. First, as far as the review of the World Bank's experience is concerned, it excludes lending for rural infrastructure through “social funds.” The report was prepared at about the same time as the review of the World Bank experience with social funds,5 and it would have been presumptuous and wasteful to attempt to duplicate the extensive work done in the context of that review.

Second, it excludes certain types of so-called “social” rural infrastructure. The distinction between “social” and “economic” infrastructure is largely arbitrary, and has more to do with the feasibility of computing an economic rate of return than with whether an investment is of an economic, as opposed to a social, nature. In practice, particularly in the rural context, improvements in transport may do as much for education as the building of a school.
and, conversely, improving a school may do as much for growth as improving transport. While the traditional distinction between social and economic infrastructure is therefore somewhat arbitrary, there is nevertheless a fundamental difference between two different types of rural infrastructure.

Some types of infrastructure can be expected to serve their purpose simply by being kept in good condition, while for other types far more is required. At one extreme a well-maintained road can be expected to serve its purpose without further ado, while at the other extreme a clinic without staff and supplies or a school without qualified teachers will serve no purpose. In between these two extremes, a rural water scheme may require some intervention if, for example, water needs to be rationed or treated, but by and large it will serve its purpose, provided it is kept in good repair. This review limits itself to RI investments that can be expected to function as long as they are kept in good operating condition. As such it includes the transport, energy, irrigation (except for large-scale irrigation schemes), and water supply and sanitation sectors, but excludes the health and education sectors. While there is logic to this choice, it would certainly be interesting to review whether and how the conclusions reached would be modified for the type of infrastructure this review does not cover.

The presumption is that the challenge of staffing and operating health and education facilities is such that, when it can be met, the infrastructure challenge can be treated as a minor concern. But this may not be an obvious conclusion, and “social” rural infrastructure might benefit from a separate review.

Data Bases

This review started with an inventory of all World Bank operations with a rural infrastructure component financed between fiscal 1972 and fiscal 1996. The inventory counted 809 projects, including 604 completed projects and 205 which, as of the end of fiscal 1996, were still under implementation or for which a completion report had not yet been filed. This inventory may not be absolutely complete but it includes the vast majority of projects with an RI component financed by the World Bank since the early 1970s.

From this large base the three time periods (fiscal 1974–76, 1984–86, and 1994–96) were selected for a more detailed review. In addition to being 10 years apart, these periods were selected because they correspond to landmarks in the Bank’s thinking, and thus have particular relevance to its views on rural development. The fiscal 1974–76 period came in the wake of the 1972 World Bank Nairobi Annual Meetings, which put rural poverty at the center of the Bank’s agenda and resulted in the popular “integrated rural development” projects of the mid- to late-1970s. The fiscal 1984–86 period was a turning point not only because of disillusionment with integrated rural development, but also because of the serious questions raised about the implicit “central planning” frame of mind on which it rested. Finally, the fiscal 1994–96 period is not only the most recent from which we can draw, but is also very rich in new approaches, particularly with regard to participation and social policies. For each of these periods a span of three years was selected to provide a large enough number of projects from which to draw basic statistical conclusions.

The 225 projects financed during these three three-year periods, in particular a subsample of 79 projects that included RI components in excess of 20 percent of total project cost (“significant projects”), were singled out for a more in-depth review. The data collected on these projects is described in appendix 1.

Organization of the Volume

Chapter two summarizes the trends and achievements in past World Bank lending for rural infrastructure, and draws broad conclusions from this lending experience. Chapters three through six enter into detail on specific points relating respectively to decentralization, accountability and commitment, poverty, and economic and financial issues.
Notes


5. World Bank, “Portfolio Improvement Program: Review of the Social Funds Portfolio” (forthcoming), Washington, D.C.

6. In addition to the conditions described in paragraphs 1.6 and 1.7, the inventory has four limitations: (a) it is based on a search of existing Bank databases using a variety of keywords and it is possible that a few operations may have avoided the net because they did not include the keywords used in the search; (b) completed operations are included in the OED database, while ongoing operations are included in the Bank lending database, and it is not clear whether the two databases are strictly complementary or leave a number of projects out at the junction between the two databases; (c) the OED database may leave a few operations out in the early years of its existence; (d) information in the lending database is provided by the regions and it is not kept entirely up-to-date.
From the early 1970s to the end of fiscal 1996 the World Bank financed upwards of 800 projects with a rural infrastructure component (excluding dedicated irrigation projects and social fund operations). Cumulatively, these rural infrastructure components represented more than US$40 billion worth of investments in 1996 dollars. Starting with fewer than 10 projects a year in the early 1970s, rural infrastructure lending increased quickly and dramatically from the mid-1970s onwards, in the wake of the surge in rural development lending that followed the 1972 Nairobi Annual Meetings. It peaked with 53 projects in fiscal 1979 and fiscal 1981, and averaged a solid 45 projects annually between fiscal 1975–84. This means that during this period one project out of every four the World Bank was financing had a rural infrastructure component. Following this peak, the number decreased steadily to an average of about 10 a year. Figures A2.1 and A2.2 in appendix 2 show the trend in the number of operations with an RI component and the cost of these components for each fiscal year since 1972.

**Sectoral Breakdown**

As shown in figure 1 below, agriculture has the lion’s share of projects with an RI component, accounting for two-thirds of the total number of projects since 1972. Transport comes a distant second with 16 percent, while energy, water supply, and telecommunications share...
third place, with between 5 percent and 6 percent. Although agriculture dominates the scene in terms of number of projects, it has a smaller edge in volume of investment, accounting for only 34 percent of the total, with energy and transport close behind at 30 percent and 23 percent, respectively. Second place goes either to transport or energy, depending upon whether we consider the number of operations or the volume of investment. This is essentially explained by the geographical distribution of the lending. Rural electrification projects are concentrated in large Asian and Latin American countries where the Bank has large-scale operations, while transportation lending is much more widely dispersed and covers many countries where operations may be as small as a few million dollars.

Within the agricultural sector the most frequent type of RI components are irrigation and drainage, transport, water supply, and markets. Agriculture projects have typically not included energy or telecommunication components.

**Regional Breakdown**

Figure 2 shows the distribution of rural infrastructure lending by region. It reveals that the largest share of the total number of projects went to Africa, although in dollar terms, Asia and Latin America were the heaviest borrowers.

**Trends**

While the number of projects with an RI component may appear impressive, the component is often very small. This was particularly true during the peak 10-year period from fiscal 1975–84, when almost 40 percent of these projects dedicated no more than 5 percent of total investment cost to rural infrastructure. Globally, for the fiscal 1972–96 only 62 percent of projects had an infrastructure component in excess of 5 percent of total project cost, and they accounted for 97 percent of total RI investments financed by the Bank (figure 3).

As may be expected, small components get very little attention. For example, over half the overviews of project completion or audit reports for projects financed in fiscal 1974–76 and fiscal 1984–86 do not even mention the outcome of the infrastructure components. It seems these components start receiving attention only when they amount to a minimum of 15 percent of total project cost. Below 15 percent very few projects pay any attention to the infrastructure component, while when RI investment is above 25 percent, almost all do.

Thus this review concentrated on projects for which the infrastructure component was at least 20 percent of total project cost. Over the period fiscal 1972–96, these projects accounted for 81 percent of total RI lending.
The most important aspect of these statistics is that, while the number of projects with an RI component decreased markedly over the years (to less than one-third of what it was during the peak of the late 1970s), the number of significant projects has remained remarkably constant, as shown in table 1 below.

Increase in Focus

This means that RI lending is now much more focused than it was 10 or 20 years ago. Projects with a negligible or small component are now the exception rather than the rule. This trend applies to all sectors, but is particularly relevant in agriculture, where the percentage of significant projects increased from 65 percent in fiscal 1974–76 and 70 percent in fiscal 1984–86 to 96 percent in fiscal 1994–96. However, this increase in the focus of agricultural projects has gone hand-in-hand with a substantial decrease in the overall number of agriculture projects with an RI component: from 85 in fiscal 1974–76 to 42 a decade later, and then to 15 in the most recent period covered in this review. On balance, the decrease in the number of projects has overshadowed the increase in focus, with the net result that the agricultural sector is now much less involved in rural infrastructure than it was 20, or even 10, years ago.

Geographically, the increase in focus has been particularly significant in Africa, where the percentage of significant projects has gone from only 30 percent in fiscal 1974–76 to 77 percent today.

Increase in Share of Small-Scale Rural Infrastructure

The types of rural infrastructure financed through World Bank projects are highly diverse. In the transport sector a fiscal 1975 Ethiopia project financed roads costing over US$100,000
per kilometer, while one year later, a project in Senegal aimed at roads costing less than US$5,000 per kilometer. In irrigation, the Ghana fiscal 1994 agriculture sector investment credit estimated costs at US$5,000 per hectare, while in the same fiscal year the Indonesia Integrated Swamp Project was estimated to cost US$723 per hectare. In water supply and sanitation the fiscal 1985 China Rural Water Project estimated per capita costs at US$24, while the fiscal 1984 Tunisia Project estimated them at US$150. These cost differences essentially reflect variations in design standards and type of infrastructure being financed. The Ethiopian highway project developed secondary roads providing access to a whole region, while the Senegal project consisted of feeder roads linking small villages to a secondary road. The China water project supplied village wells, while the Tunisia project was a piped scheme.

The review tried to classify RI investments into three broad categories: small, medium, and large. Small investments are typically short sections of road built to low design standards to link a village to a secondary road, or wells equipped with a hand-pump to serve a section of a village. Large investments would typically be secondary roads linking a trunk road to a regional administrative center, a power transmission line serving a region being electrified, or a primary irrigation canal. Medium-size investments are everything in between these two extremes. The results are shown in table 2 below.

Considering the subjectivity of judgment underlying the figures on which this table is based, the difference between the fiscal 1974–76 and fiscal 1984–86 data is not meaningful. But even allowing for large inaccuracies, the sharp increase in the percentage of operations in which the majority of investments were small during the fiscal 1994–96 period indicates a clear shift toward the financing of smaller types of rural infrastructure. The trend would be even more pronounced if social fund projects were included in this review, since they also tend to concentrate on small investments.

**Lending Objectives**

The increased focus of RI lending has gone hand-in-hand with a sharpening of the objectives of these operations and an increase in their policy content. In the 1970s the primary, if not unique, objective of RI was to build rural infrastructure. This was particularly true in the case of rural development projects. Infrastructure was considered to be one of the barriers to rural growth that had to be overcome through investment. The institutional aspects of how this infrastructure was to be built, operated, and maintained receive little, if any, attention.

This lack of attention emerges clearly in the evolution of the objectives of RI lending. For the period fiscal 1974–76, as many as 70 percent of the projects with an RI component of at least 20 percent of total project cost barely mention, or even fail to mention, the objective of that component. The objective would be mentioned in the project description and occasionally described in some detail in an annex (for example, in rural development projects), but with no indication of why the component was important or what objectives were being pursued. It was implicitly assumed that the RI component was necessary if the project was to meet its other objectives, but it had no stated objectives of its own.

As shown in table 3, a decade later this percentage had dropped by more than half, to 32 percent, and in recent years it has dropped even further, to 23 percent. All the projects in this category in recent years are agriculture projects concentrating on the development of a specific area; two of them are agriculture sector loans. At the other end of the spectrum, the percentage of projects with clearly stated RI

<table>
<thead>
<tr>
<th>Period</th>
<th>Small</th>
<th>Medium</th>
<th>Large</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiscal 1974–76</td>
<td>19</td>
<td>74</td>
<td>7</td>
</tr>
<tr>
<td>Fiscal 1984–86</td>
<td>10</td>
<td>86</td>
<td>5</td>
</tr>
<tr>
<td>Fiscal 1994–96</td>
<td>60</td>
<td>30</td>
<td>10</td>
</tr>
</tbody>
</table>
Table 3 Objectives of rural infrastructure component (percent)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No explicit objectives</td>
<td>70</td>
<td>32</td>
<td>23</td>
</tr>
<tr>
<td>Some implicit objectives</td>
<td>19</td>
<td>32</td>
<td>37</td>
</tr>
<tr>
<td>Clear objectives</td>
<td>11</td>
<td>36</td>
<td>40</td>
</tr>
</tbody>
</table>

Objectives has almost doubled, increasing from 23 to 40 percent. Between these two extremes are projects for which the objectives are implicit or the same for the rural and nonrural component. For example, a road project will address maintenance, whether it be for rural roads or interurban roads, and an energy project will address cost recovery and tariffs in both the rural and urban context. It is important to note that these percentages refer only to “significant” projects. In years past many projects had a small or even negligible infrastructure component, and it goes without saying that the objectives of that component were not specified.

Turning from the quantitative aspects of World Bank rural infrastructure lending to its qualitative aspects, the following paragraphs review the evolution of the thinking on some key aspects of projects.

Financial Objectives

Of the various implicit or explicit project objectives, financial objectives have received the least attention. Only nine of the 79 projects on which this review concentrates can be considered to have a convincing discussion of pricing, cost recovery, or both (table 4). For twice as many the treatment has been strictly descriptive, and for the rest either inadequate or non-existent. The score is even worse in regard to financing. Not a single operation discusses the relative merit of various potential financing alternatives. Only nine describe the country financing policy, while the rest simply state who will contribute what—and not always very clearly, especially in the case of government financing other than by the central government. This lack of attention to financial issues is only now being remedied; six of the nine projects which address pricing in a satisfactory manner, and eight of the nine which pay attention to financing, belong to the 1994–96 group.

Until now it would seem that financial considerations were not expected to be relevant to rural infrastructure. This is probably because of an implicit belief that it would have to be subsidized, either because rural populations could not possibly pay for it, or because they should not, to correct the much debated urban/rural bias. It is only recently, outside the energy and water sectors, that the link between financial policy, sustainability, and replicability has begun to emerge as an important issue.

Institutional Development Objectives

Except in the energy sector, most projects dealing with rural infrastructure delegate at least part of the investment decisionmaking and implementation processes to government levels below that of the central government. The degree of responsibility of these various regional or local government levels—and increasingly, local communities—is often ill-defined, yet it

Table 4 Financial objectives in selected fiscal year periods, 1974–96 (percent)

<table>
<thead>
<tr>
<th>Score</th>
<th>Cost recovery</th>
<th></th>
<th></th>
<th>Financing</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>74–76</td>
<td>84–86</td>
<td>94–96</td>
<td>74–76</td>
<td>84–86</td>
<td>94–96</td>
</tr>
<tr>
<td>Not stated/Inadequate</td>
<td>85</td>
<td>45</td>
<td>60</td>
<td>96</td>
<td>100</td>
<td>73</td>
</tr>
<tr>
<td>Descriptive</td>
<td>11</td>
<td>45</td>
<td>20</td>
<td>4</td>
<td>0</td>
<td>27</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>4</td>
<td>9</td>
<td>20</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

a. The smaller percentage of projects during this period that do not address cost recovery/pricing is largely explained by a greater share of energy and water projects, in which these issues have traditionally been covered than in other sectors.
is crucial to project implementation. One would therefore expect that RI operations would describe in some detail the prevailing institutional set-up and discuss the way in which it affects projects. Yet, as table 5 shows, it is not until very recently that institutional objectives, particularly in the crucial area of decentralization policies, have received attention in some projects. Until 10 years ago almost no projects addressed these issues; more recently they were addressed in one-half of projects, and one-third of those that did so, did it in a very satisfactory way.

**Poverty Alleviation**

While poverty alleviation has always been an objective of RI lending, it was essentially an indirect objective: rural areas were those seen as having the largest concentration of poor and thus, by investing in those areas, projects were seen as helping the poor. It is only recently that poverty alleviation has become an explicit objective of RI lending, either by focusing on investments directly aimed at the poor or by using the investments to create employment. Labor-intensive construction of rural infrastructure has been a standard feature of a number of projects for many years, particularly in Asia, but it was viewed essentially as a way to improve economic efficiency and reduce construction costs. A major difference with the earlier approach is the recognition that, if the creation of employment is to have an impact on poverty, the poor must be paid for their labor. This was not always the case in earlier projects promoting labor-intensive construction methods.

The review tracked the poverty objectives of RI projects using three criteria:

- Whether poverty was an explicit criterion in the selection of specific subprojects
- Whether poverty was addressed in the pricing of rural infrastructure services
- Whether poverty was addressed through the creation of employment.

The record is almost blank on all three criteria for the projects financed in fiscal 1974–76 and fiscal 1984–86. Of the 49 projects covered in this review and financed in these two periods, only three addressed poverty as a subproject selection criterion, two addressed employment creation, and one addressed pricing. But this is beginning to change. Of the 30 projects financed in fiscal 1994–96 and covered in the review, seven built poverty alleviation explicitly into the subproject selection criteria, six addressed employment creation, and three addressed pricing. The trend toward addressing poverty actually began in fiscal 1995; of the eight projects financed in fiscal 1996 and included in this review, all but two addressed at least one of the three poverty criteria mentioned above.

**Technical Objectives**

In contrast with the limited attention paid to financial, institutional, or poverty objectives, a number of the earlier operations addressed "technical" objectives. The review tracked these technical objectives in three areas:

- **Appropriate design standards.** Depending on whether rural infrastructure is being handled by central government core ministries or local governments and local communities, prevailing design standards may be at two extreme ends of the spectrum. Central government core ministries tend to treat design standards similarly to trunk infrastructure, and to overdrafts, while local communities—with very limited resources and engineering competence—tend to underdesign. A number of projects have attempted to address this issue by promoting design standards appropriate
to the level of service expected from the infrastructure being built.

- **Labor-intensive construction.** A number of projects have attempted to build on traditional labor-intensive construction methods in countries that had such a tradition, while others attempted to introduce them where they did not exist.

- **Other technological innovations.** The most prevalent interventions in this respect have been in contracting methods and the promotion of small-scale contractors.

As early as the 1970s about one-fourth of the projects included at least one of the above features among their objectives. In the 1980s as many as half of them did so, and in the 1990s the percentage reached 57 percent. As shown in table 6, recent projects continue to put heavy emphasis on technical issues; attention to employment creation has resulted in a major push for labor-intensive construction methods. The rise in the percentage of "other technical innovations" stems from an increase in project implementation innovations. These innovations are aimed at giving the private sector a larger role than in the past, when it was limited to promoting a shift from force account to contractor implementation, and promoting the development of small-scale contractors.

**Achievements**

This section reviews the outcome of completed operations. It is based on the World Bank Operations Evaluation Department’s (OED) records but differs from OED’s ratings in several ways.

**Divergence from OED’s Evaluations**

First, where projects were not exclusively dedicated to rural infrastructure, this review attempts to separate the outcome of the infrastructure component from the overall outcome of the project.

Second, the present review concentrates on only two indicators: physical achievement and sustainability. In contrast, OED rates projects according to their outcome, institutional development impact, and sustainability. The elimination of the institutional development rating stems from the problem in formulating a good definition of institutional achievements. Establishing an embryo of an institution where none existed before can be quite an accomplishment, even if the new institution is very basic and it would be premature to qualify the institutional development impact of the project as “substantial.” At the opposite end of the spectrum, the introduction of a sophisticated accounting system may not be a major accomplishment when working with a well-established entity. Whether institutional development impact is judged from a relative or absolute point of view is not obvious, and constitutes the first difficulty in establishing an institutional development rating.

Even more important is the difficulty of weighing the relative importance of long-term, as opposed to short-term, institutional impact. This is a critical issue in the case of rural infrastructure, where it is relatively easy to put a specialized unit in place, with the help of technical assistance, to get the infrastructure built. These units tend to perform well and, if institutional development is judged from a short-term point of view, projects of this type tend

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</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Design standards</td>
<td>81</td>
<td>19</td>
<td>64</td>
<td>36</td>
<td>67</td>
<td>33</td>
</tr>
<tr>
<td>Labor-intensive construction</td>
<td>85</td>
<td>15</td>
<td>77</td>
<td>23</td>
<td>60</td>
<td>40</td>
</tr>
<tr>
<td>Others</td>
<td>96</td>
<td>4</td>
<td>86</td>
<td>14</td>
<td>67</td>
<td>33</td>
</tr>
</tbody>
</table>
to score high. The mandate of these units, however, generally ends with the investment phase, and high scores during implementation tend to contrast with very low operation and maintenance (O&M) expectations when the infrastructure is turned over to others after completion. Rather than spend a great deal of time weighing relative versus absolute institutional achievements and long-term versus short-term results, the review chose to ignore the institutional development impact and to judge operations strictly on the basis of their results. The physical achievement rating concentrates on whether the project managed to get the infrastructure built and how well it did so, while the sustainability rating concentrates on whether what was built stood a reasonable chance of lasting.

The main limitation of these two ratings is that they leave out the economic impact of the project. Traditionally, the ex post economic rate of return of projects has been a key factor in evaluating Bank operations; it is given an important weight in the various factors that come into OED’s project outcome ratings. There are many reasons why the economic rate of return has been substantially downplayed in this review. As will be discussed in chapter six, considerable difficulties are involved in computing a meaningful rate of return on an RI investment, thus casting doubts on the validity of many rate-of-return computations. In addition rates of return on projects that are not limited to rural infrastructure are often composite returns, which do not dissociate the infrastructure component of the project from the rest of the project. Finally, because sustainability of RI investments is such an important issue, as will be discussed below, rates of return computed after project completion are almost as speculative as those computed at appraisal, and thus cannot be considered to be meaningful indicators of the project’s economic impact. As chapter 6 will illustrate, much more work needs to be done on the economics of rural infrastructure, and without benefit of this work it is difficult to arrive at a firm assessment of the economic justification of past operations. However, the overwhelming impression coming out of this review is that most RI investments financed in Bank projects met strong needs, which should have translated themselves into high economic rates of return, given reasonable O&M. The economic impact of past projects, like their institutional impact, can therefore safely be assumed to be subsumed by the sustainability rating.

Two other divergences from OED’s ratings have to do with the weight given to delays in project implementation and the likelihood of good maintenance. While delays in project completion were taken into consideration, they were given less weight than they seem to receive in the OED evaluation process (particularly as reflected in project completion reports) for at least two reasons. First, it is not clear that project completion delays necessarily put project objectives in question, particularly as far as their industrial development objectives are concerned. As will be discussed in chapter four, beneficiary and agency commitment to rural infrastructure seem to be key success factors, and building commitment takes time. Ideally, this commitment building ought to take place before project implementation starts but, in practice, it often does not, sometimes for the wrong reasons and sometimes for the very pragmatic reason that agencies or beneficiaries or both want to see evidence that a promise is more than political talk before they throw their weight behind an operation. This charitable interpretation of the reasons for delay does not always apply, and delays often result from inadequate planning or preparation. However, where it does apply, taking the time to seek consensus and/or commitment seems so important that it certainly should justify the risk of being over-generous where it might not apply.

Second, completion delays are measured against appraisal targets that are often grossly over-optimistic. Delays may therefore result more from failure to estimate the time that a project will require than from the failure of the project itself.
In contrast with a tendency to be more tolerant of implementation delays, this review is probably stricter in its assessment of the prospect for sustainability, putting heavy emphasis on the likelihood that maintenance will be carried out. For example, the sustainability of the Benin fiscal 1984 Fourth Feeder Roads Project was rated as "likely" by OED, probably on the ground that maintenance had progressed satisfactorily with increased productivity during the project implementation phase. However, the project completion report also indicated that no source of permanent financing had been identified to continue maintenance after project completion; on this basis, the project sustainability was rated as "unlikely" in this review. This pessimistic sustainability rating reflects considerable skepticism regarding the likelihood of funds for O&M being made available from the general budget, if there was no precedent. In general the review assigned projects a higher sustainability prospect when maintenance financing was the responsibility of revenue-earning agencies (as in the case of power projects) than when it was based on promises of budget financing without a reasonable track record.

These assumptions are important, as they may play a significant role in explaining the results presented in the rest of this section. There are no "scientific" or absolute measures of whether an operation has succeeded or failed, and evaluation results are strongly influenced by the perspective of the evaluator. The rest of this section must therefore be read within the evaluation context described above.

### Physical Achievements

Physical achievements were rated on a scale of one to three; a rating of "two" designates a project that met its physical objectives. Within the cost estimate, a "one" rating reflects underachievement, either because of a cost overrun or a shortfall in the quantity of the infrastructure built, and a "three" reflects overachievement in one or both of these areas.

Table 7 summarizes the results of the analysis. It shows that, in general, the RI components of projects have been executed satisfactorily, and have improved between the fiscal 1974–76 and fiscal 1984–86 periods, during which only 15 percent of projects fell short of their appraisal target. It also shows that for the period fiscal 1984–86, the last one for which completion and audit reports are available, the percentage of projects that actually exceeded their physical targets was more than double the percentage that fell short; that is, overachievement far exceeded underachievement. This leads to the broad conclusion that, at the present time, the physical implementation of rural infrastructure is not a problem, and that either Bank borrowers are capable of dealing with this challenge or that, where they may not be, knows how to get around the problem. The sample on which these statistics are based is too small to draw categorical conclusions about the link between satisfactory physical achievements and the relative share of RI in overall project costs, but the data seem to indicate that this is not a significant factor. Results are roughly similar for the entire group, including projects in which the RI component is at least 20 percent of the total project cost (significant projects) or more than 50 percent (large components).

Table 8 shows the variations by sector for projects with a significant RI component financed during fiscal 1984–86. Ratings for the

<table>
<thead>
<tr>
<th>Project</th>
<th>Underachievement</th>
<th>Satisfactory</th>
<th>Overachievement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiscal 1974–76</td>
<td>31</td>
<td>62</td>
<td>7</td>
</tr>
<tr>
<td>Fiscal 1984–86</td>
<td>23</td>
<td>60</td>
<td>17</td>
</tr>
<tr>
<td>Significant projects</td>
<td>Fiscal 1974–76</td>
<td>33</td>
<td>54</td>
</tr>
<tr>
<td>Fiscal 1984–86</td>
<td>15</td>
<td>50</td>
<td>35</td>
</tr>
<tr>
<td>Large RI component projects</td>
<td>Fiscal 1974–76</td>
<td>25</td>
<td>75</td>
</tr>
<tr>
<td>Fiscal 1984–86</td>
<td>13</td>
<td>53</td>
<td>33</td>
</tr>
</tbody>
</table>
transport and energy sectors are based on a very small sample of four projects each. However, the rating for the energy sector seems to be representative of the overall good experience with rural electrification projects. These projects are mostly in the more advanced countries of Asia, Latin America, the Middle East, and North Africa and are implemented by well-established power companies that experience little difficulty working in rural areas. In contrast, the rating for the transport sector is less representative of the overall result in the sector, as it has been pulled down by a single project, the Chiapas Rural Roads Projects, which is unusual by transport-sector standards. Nevertheless, investments in rural transport normally precede investments in rural electrification by a number of years, and rural transport projects are often carried out in countries with very weak human resources, where implementation can be expected to be more problematic.

Ratings for both the agriculture and water and sanitation sectors are very satisfactory, indicating that, on average, projects in these two sectors exceeded their physical targets. The record in the agriculture sector is particularly interesting, in that it reflects a considerable improvement over the previous 10-year period, during which the average physical implementation rating was only 1.79.

The sectoral achievement breakdown also shows that when it comes to physical achievements, there is relatively little difference between rural infrastructure financed within the confines of single-sector projects (for example, energy, transport, or water) and rural infrastructure financed within an agriculture project. The average rating of 2.14 for agriculture projects is well in line with the overall rating of 2.18 for all projects combined.

A number of reasons can be cited for the overachievement of physical targets. In some cases it simply reflects a reallocation of resources from other project components that may run into difficulty, or infrastructure that is easier to implement. But in many cases overachievement reflects a strong emphasis on physical accomplishment, sometimes at the expense of institution building. This was particularly true of earlier projects that relied heavily on project implementation units that were often staffed by a large contingent of expatriates. Typical of this trend were many rural development and rural roads projects financed in Africa in the late 1970s. They were structured like trunk road projects, with substantial consultant input in road selection, design, and construction, despite the fact that their main objective was supposed to be to build local capacity to perform these tasks. A more positive reason for overachievement is the impact of these projects on reduction in design standards and unit costs through technical innovations and competitive bidding. This is the case particularly when a central agency (such as a power or water company or a road department that has traditionally operated in the urban area) starts operating in rural areas and discovers—often as a result of World Bank prodding—that design standards can be lowered. Similar cost reductions may occur when local governments improve their procurement procedures, often resulting not only in lower cost but better quality work as well.

**Sustainability**

In line with OED practice, projects were rated on a scale of one to three, depending upon whether sustainability was considered to be "unlikely," "uncertain," or "likely." It should be kept in mind that these ratings, like those of OED, are based upon assessments made at project completion. As such, they reflect expec-
Table 9  Sustainability ratings of projects, fiscal 1984–86

<table>
<thead>
<tr>
<th>Project</th>
<th>Rural infrastructure component</th>
<th>OED’s overall ratinga</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unlikely</td>
<td>Uncertain</td>
</tr>
<tr>
<td>All projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Projects with significant components</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>Projects with large components</td>
<td>19</td>
<td>25</td>
</tr>
<tr>
<td>All fiscal 1990–94 OED projectsb</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b. Projects completed in fiscal 1990–94.

tation and not reality, and reality may well be
even more humbling than the following results
suggest. Table 9 shows results for the infra-
structure component of the fiscal 1984–86 pro-
jects included in the review, as well as OED
overall sustainability ratings for the projects
that included these components. These figures
show that sustainability can be expected in just
over half the “significant” projects. This is a
major improvement over the results of the fis-
cal 1974–76 cohort. Completion and audit re-
ports for many of these earlier projects say very
little about sustainability prospects. However,
in about half the cases it is possible to make
inferences and, where this is possible, it would
seem that only about 10 percent of these earlier
operations could be expected to be sustainable.
As in the case of physical achievements, sus-
tainability does not improve with the share of
the RI component in the overall project. The
expectation is about the same for projects in
which the share is more than 20 percent as for
those in which it is more than 50 percent.

The “likely” figures are better for RI compo-
ents than for the entire project (50 percent
versus 55 percent and 56 percent); however the
5 percentage points difference is too small, in
relation to the subjectivity of the underlying
ratings, to be meaningful. Nevertheless, the
fivefold increase in the percentage of projects
falling in the “unlikely” category (5 and 6 per-
cent, versus 23 and 19 percent, respectively) is
noteworthy. The increase appears to reflect the
crucial importance of the availability of O&M
financing to ensure sustainability of infrastruc-
ture. For a number of project components a
good institution may be enough to guarantee
sustainability, but for infrastructure, institu-
tions are not enough—financing is a major ad-
ditional hurdle.

Table 9 also shows that sustainability expec-
tations for projects containing an RI component
are the same as those of the Bank portfolio at
large. Of the projects evaluated between fiscal
1990 and fiscal 1994 (corresponding roughly to
projects approved in the fiscal 1984–86 period),
48 percent were expected to be sustainable, a
figure that corresponds to the fiscal 1984–86
cohort of projects with an RI component. Simi-
larly, 18 percent were not expected to be sus-
tainable in both cases. From this point of view,
therefore, RI projects exhibit no special charac-
teristics or differences.

As shown in table 10, sustainability achieve-
ments vary significantly from sector to sector.

The agriculture rating is boosted by two
settlement projects in Indonesia and Malaysia
carried out under the jurisdiction of strong
agencies that can be relied upon not only to
build rural infrastructure, but to operate and
maintain it after construction. If one excludes
these two projects, which are not entirely rep-
resentative of the overall agriculture portfo-
lio, the sustainability rating of the rural infrastructure component of agriculture projects drops to 1.40, well below the average for all projects.

Achievements in the transport sector are not much better, reflecting the tremendous difficulty in securing finance for rural road maintenance. Road maintenance is problematic under any circumstance, but particularly for rural roads, which have much less “visibility” than trunk roads. This lack of political clout is combined with low design standards—in line with low traffic levels—with the result that rural roads have very little resilience to inadequate maintenance, making them extremely vulnerable to inadequate funding.

At the other end of the spectrum, rural electrification schemes can be cross-subsidized by the rest of the network. With good institutions and reasonably secure financing, rural electrification can therefore be expected to be sustainable, thus explaining the high score arrived at in this review. The water sector also scores highly. The result is particularly noteworthy in that, while some projects rely on a qualified company operating in both urban and rural sectors, as in the case of the energy sector, others aim specifically at rural institutions. The latter are as difficult to build up as their counterparts in the agriculture or transport sectors. Typical examples of successful projects of this type in the fiscal 1984–86 period are the China and Mali rural water projects. The key feature of these projects was successful beneficiary participation.

These sectoral variations lead to at least three conclusions:

- The best hope for sustainability lies in rural infrastructure managed by strong, revenue-earning agencies that have only a small portion of their activities in rural areas and that create specialized departments or units to deal with rural activities.
- The second most promising case is that of very small-scale rural infrastructure, exclusively serving well-circumscribed communities in which the beneficiaries are willing and able to assume a major role in O&M as well as in investment selection.\(^1\)
- Outside these two cases sustainability is a major challenge, with low expectations that it will be achieved by project completion, and probably an even lower probability that it will be realized in practice.

Conclusions

The review of the World Bank’s RI lending experience leads to many specific lessons which, together with the available literature on the subject, will be addressed in the rest of this paper. But three main conclusions are of overarching importance. The first is that there is no magic or standard model for successful RI investments. The other two are the key reasons behind this conclusion: first, rural infrastructure is an inherently heterogeneous sector, and second, it is a sector that, more than many others, is extremely dependent upon culture and tradition.

No Standard Model

Perhaps one of the most striking, though not unexpected, lessons from the review is that no single institutional or project design model ensures success or failure. Exceptions or counter-evidence can be found for any assertions in this regard. For example, much has been made of the complexity of earlier rural development projects, suggesting that more narrowly focused operations were the key to success. The Mexico fiscal 1985 Chiapas Rural Roads Project was carefully crafted and financed in parallel with a development project that addressed broader rural development issues. It was a textbook example of an attempt to single out a sector for a concentrated intervention, and thus escape the “Christmas tree” syndrome of traditional rural development projects. Yet the project was a total failure, and was canceled after only 5 percent of the loan amount had been disbursed. By contrast, the parallel rural development project, including its own road component, worked reasonably well, indicat-
ing that single-sector projects are not a sufficient condition for success.

The Korea Rural Infrastructure Project of the early 1970s shows that single-sector interventions are not a necessary condition either. This project addressed four sectors (the maximum number considered in this review) and brought in four different implementation agencies, yet was extremely successful. Examples can just as easily be found to disprove the traditional expectation of a strong link between sustainability and beneficiary participation. The fiscal 1984 Mali Rural Water Project seems to have been successful in achieving a reasonable level of expected sustainability, even though the beneficiaries contributed relatively little up front. Rural electrification projects offer even stronger examples of a disconnect between beneficiary participation and sustainability: they have a strong likelihood of sustainability, but the extent of beneficiary participation is very limited. While these are just a few examples, the list is almost endless, and for almost any successful institutional model a case can probably be found in which the same model failed and, more importantly, in which success was achieved using an entirely different model.

Heterogeneity

The first explanation for the absence of a single "right" way to deal with rural infrastructure is its heterogeneity. The review referred above to the wide variations in unit costs of RI. Unit costs per kilometer of road being built or per person served by a water scheme can easily vary from one to 10, depending upon whether the water scheme is serving a small community or a rural town, and whether the road is a farm-to-market road or a secondary road. It will vary within similarly wide proportions depending on terrain or availability of construction material. The engineering and construction complexity will often be in line with the variations in cost, and will also vary across sectors. Digging a ditch is a fairly simple operation, while bringing electricity to a village requires more specialized skills, and is best left in the hands of the power company or its contractors.

In addition to cost and engineering heterogeneity is heterogeneity resulting from whether the service to be provided by the infrastructure is a private or public good. The distinction here is the same as for trunk or urban infrastructure, with all the same implications on the institutional and pricing front. It is relatively easy to organize a group of a dozen families to pay for and operate a common well, but it is much more difficult to organize a half-dozen villages to pay for and maintain a road serving the geographical area in which they are located. Finally, everything else being equal, the number of beneficiaries makes a difference. For example, the recent Bangladesh Rural Roads Project includes roads that, even though they are to be built to very low standards, will benefit up to half a million people. By contrast, the road component of the Indonesia Village Infrastructure Project concentrates on small road sections, essentially connecting small villages to a secondary road. The involvement of the beneficiaries in these two projects can certainly be expected to be quite different. These fundamental differences have a dramatic impact on the kind of competence required to build and maintain the infrastructure, the amount of money it will entail, and indirectly, the source of financing and the institutional set-up most appropriate to operate and manage it.

Importance of the Existing Social Fabric

Important in any project, tradition and social structures seem to play an even more important role in rural infrastructure, where the action is closer to the beneficiaries. Policy changes are easy to enact and can be implemented at the highest level, but changing attitudes at the lowest level is much more difficult. For example, labor-intensive construction of RI, which is almost systematic in Asia, has been very difficult to accomplish in a number of African countries, where it has been associated with the forced labor practices of the colonial
area. Participatory decisionmaking and implementation methods are much easier to carry out in countries with a tradition of community self-help than in those that have relied for many years on top-down government intervention. For example the audit report on the Burkina Faso Second Rural Development Project expresses concern about increased reliance on farmers’ participation in maintenance, because this depends on changes in work habits and mentality.

It is easy and common practice to identify all the traditional and social barriers that impede successful project implementation. A more difficult and less common practice is identifying that which could provide the seeds of success, given existing traditions and social structures. Yet some of the most remarkable successes have been those that have made that effort; for example, the Korea Rural Infrastructure Project built on the Saemaeul Movement. A recent Bolivia Community Development Project builds on the traditional decisionmaking system, and the appraisal report notes that:

Rural society, across the ethnic groups, is composed of and revolves around community organizations that carry out important social, economic, and religious functions. Any important community issue is decided by consensus in the assembly of heads of families of the community’s highest decisionmaking authority, the *ayllu*. In most respects, allegiance to the *ayllu* and the community far exceeds that to any civil government. The *ayllu* manages and distributes communal lands and resolves disputes among members and between other communities. Through these organizations, the traditional rural community concepts, reciprocity, consensus, and redistribution prevail.\(^2\)

Notes

1. This finding is consistent with the notion of “privileged group” referred to in chapter 3.
The necessity for decentralizing responsibility for rural infrastructure is rooted in fairly simple arithmetic. RI investments can be minuscule and benefit a few dozen people, as for example, in the case of a water well. While this is an extreme case, and some RI investments may benefit large segments of the population, by and large, rural infrastructure is widely dispersed with a very large number of components and a multitude of small groups of beneficiaries. For example, the Brazil Northeast Development Projects financed more than 21,000 subprojects in the two-year period 1993–1995.1

In Bangladesh the Grameen Bank, which provides less than 30 percent of the total credit transactions in the rural market, has 2 million members.2 While only some of the Grameen Bank’s clients borrow for infrastructure, these figures give an indication of the very dispersed nature of rural interventions, particularly those focusing on the poor. Similarly, also in Bangladesh, box 1 shows the composition of the roads network. The trunk and provincial networks represent less than 5 percent of the total network. For every kilometer of major roads there are, therefore, about 20 kilometers of rural roads, some of which serve only very small communities. Again, these roads are far too dispersed to be dealt with satisfactorily from the center.

While this very simple observation clearly indicates that decentralization ought to be a

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**Box 1 Bangladesh road network classification and composition**

<table>
<thead>
<tr>
<th>Category</th>
<th>Length (km)</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) National highway (NH)</td>
<td>2,539</td>
<td>Connecting national capital with divisional headquarters, old district headquarters, port cities, and international highways</td>
</tr>
<tr>
<td>(2) Regional highway (RH)</td>
<td>2,670</td>
<td>Connecting different regions not connected by the national highways</td>
</tr>
<tr>
<td>(3) Feeder road type A (FRA)</td>
<td>10,008</td>
<td>Connecting Thana headquarters to the arterial network</td>
</tr>
<tr>
<td>(4) Feeder road type B (RDB)</td>
<td>8,403</td>
<td>Connecting growth centers to the RDH network (FRA or arterial road) or to the Thana headquarters</td>
</tr>
<tr>
<td>(5) Rural road class 1 (R1)</td>
<td>32,674</td>
<td>Connecting union headquarters/local markets with the Thana headquarters or road system</td>
</tr>
<tr>
<td>(6) Rural road class 2 (R2)</td>
<td>44,861</td>
<td>Connecting villages and farms to local markets/union headquarters</td>
</tr>
<tr>
<td>(7) Rural road class 3 (R3)</td>
<td>29,450</td>
<td>Roads within villages.</td>
</tr>
</tbody>
</table>

Decentralization Is Necessary

Tabb 11 Decentralization objective (percent)

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Not stated/inadequate</td>
<td>93</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Descriptive</td>
<td>7</td>
<td>0</td>
<td>33</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>0</td>
<td>0</td>
<td>17</td>
</tr>
</tbody>
</table>

Central issue in rural infrastructure, in fact, until recently it is a topic that received very little attention. The level of responsibility of the various regional or local government levels, and local communities, often remained ill-defined and operations were conceived in isolation, without the benefit of a decentralization framework. However, recently the trend has changed dramatically. As Table 11 above shows, until 10 years ago, decentralization was not discussed at all in any projects. However, over the last three years it was addressed in half the projects and treated very satisfactorily in most cases in which it is put on the country policy agenda and backed up by economic and sector work.

In recent years the Ghana Water Supply Project, the Bolivia Communities Development Project, the Indonesia Village Infrastructure Project, and the Thailand and Indonesia rural electrification projects exemplify projects in which decentralization policy received a great deal more attention than used to be the case.

Deconcentration versus Devolution

Many decentralization models have been tried. At one extreme are cases in which a local community has full power to plan, build, operate, and maintain its infrastructure (devolution). At the other extreme are cases in which these same functions are performed at the local level, but under the authority of the representative of a central agency (deconcentration). In between is a wide range of cases in which beneficiaries have more or less power to directly influence the decisions affecting them.

The current trend in World Bank lending is toward decentralization models that are near the devolution end of the spectrum. While this may be desirable in the context of the shift towards small to very small rural infrastructure, it is not necessarily appropriate for all sectors or all types of investments. As pointed out in Chapter two, the most promising projects from a sustainability point of view are rural electrification projects, most of which use a deconcentration model. In cases where a strong central institution can be motivated to address rural issues, and is capable of doing so in a demand-oriented way, it may prove to be much simpler to approach decentralization through this agency than to try to empower and equip local communities to assume full responsibility for their entire rural infrastructure needs. The rural electrification case shows that this can be done very efficiently through a national or regional power company, and that "demand orientation" is not incompatible with a deconcentration approach. Similarly, the deconcentration model seems to be a sensible approach in the case of roads serving large, rural populations and requiring a sophisticated level of engineering. No hard and fast rule as to whether a deconcentration model is preferable to a devolution mode seems to exist. However, it would seem that large-scale schemes, serving a large group of beneficiaries and requiring more than a minimum of engineering, may lend themselves more readily to a deconcentration mode. Small-scale simple investments serving a small number of beneficiaries, maybe best addressed in a devolution mode. An unlimited number of models between the two extremes might be selected; the final choice should be guided by the issues discussed in the rest of this paper—particularly the accountability and commitment considerations addressed in Chapter four—and attuned to specific country, sector, and project circumstances.

Balance

Decentralization of the responsibility for rural infrastructure, like any other decentralization, has three key dimensions: political, fiscal, and administrative. A great deal has been written on each of these areas. Most recently the fiscal
aspects have received considerable attention in the World Bank's operational work, while extensive new conceptual work has been undertaken by political scientists and institutional economists on what would traditionally have been labeled the "institutional" aspects. These three dimensions of decentralization are important, each in their own right, but the balance between all three may be even more crucial, and may not yet have received the attention it deserves. On the conceptual front, it was only very recently that Hans Binswanger and the World Bank's Rural Development Department put together a research proposal on the issue. The literature review, published as the first output of the project, confirms the importance of balance and summarizes well the state of the art.\(^3\) On the operational side, the need for balance comes out repeatedly in reviews of past operations. For example, in an address on rural development, Binswanger brings out the all-too-frequent lack of balance between political and administrative aspects, on one side, and fiscal aspects on the other:

In Ghana and Côte d'Ivoire elected local governments were created, but the enthusiasm created dissipated rapidly because the new local governments were starved of resources.\(^4\)

A number of recent reviews in the LAC region address similar facets of the problem. For example, a review of the decentralization experience in Colombia clearly brings out the link between the administrative and political dimensions:

The case studies found again and again that local leadership—most notably by mayors, but also by community leaders, private sector individuals acting in the public interest, or political movements—emerged as a key part of the explanation of local capacity. Few if any of the municipalities showed much capacity without strong leadership. . . . This leadership function has a double facet. First, reforming the municipal administration . . . Second, achieving trust, mobilizing community resources. . . . Thus, as the experience of these municipios illustrates, successful leadership involves both managerial and political skills.\(^5\)

As pointed out in chapter two, in the past very few projects addressed the decentralization issue at all. The lessons from past lending indicate that, in correcting this weakness, it may be just as important to ensure that each of the three facets of decentralization be addressed adequately, as it is that they be well balanced. There is no point working out in great detail the level of responsibility of various levels of governments and the power of various political bodies or beneficiary representatives if the level of decentralization on that front is not matched by comparable fiscal decentralization. Similarly, there is no point to embarking on a major institution-building effort without the concomitant political commitment, as illustrated by the Chiapas Rural Roads Project.

Two more lessons may be drawn from past experience. The first will be developed more fully in the next chapter, in the section dealing with gradualism. This section implicitly suggests that project managers should be wary of achieving balance by bringing each component of the equation to the same highest common denominator, and aiming at a high level of sophistication on all fronts. Again, as the Chiapas project shows, the best can easily be the enemy of the good. A crude institutional set-up, even if it leads to a less than perfect investment selection, is far preferable to a sophisticated set-up that is systematically ignored. As a rule of thumb, achieving balance by aiming at the lowest common denominator may prove to be the wiser course. The second lesson is covered in the next section; it suggests that balance does not necessarily call for the same level of decentralization on all fronts. It may be appropriate to decentralize investment selection to a very large extent, while fiscal and financial aspects may benefit from being dealt with at a much more centralized level.
Depth of Decentralization

Table 12 indicates the percentage of time that various levels of participants, from central governments (or government agencies) to organized groups of beneficiaries, are involved in project implementation. Appraisal reports do not always clearly describe the responsibility of the various agencies involved in project implementation, and are often even less clear about who these agencies are reporting to. For example, a road project may specify that a project component will be implemented by a regional subdivision. It will seldom specify how much autonomy the regional subdivision has in relation to the ministry to which it is attached, and will say even less about the reporting arrangement (if any) between the regional subdivision and the regional government within the jurisdiction of which it is located. The figures in table 12, must therefore be interpreted as “orders of magnitudes” rather than precise measurements. They nevertheless point to fairly clear conclusions.

The first conclusion is that central governments have played, and continue to play, a significant role in almost all World Bank-financed operations. The role of central government is related to policy formulation, and even more importantly to the heavy dependence of rural infrastructure on central budget handouts, both for investment and O&M. The second conclusion is that regional and local governments are becoming involved in an increasing number of cases. Regional governments are involved six times as often now as they were in the 1970s and local governments twice as often as they were 10 years ago. The third conclusion is that the role of beneficiaries has increased even more dramatically from none in the 1970s, to a negligible level in the 1980s, to 40 percent in the 1990s.

There is no question that introducing a participatory approach in decision-making on and management of RI is pre-condition to its success. But participation can be time-consuming or expensive or both. The Grameen Bank, because the loans it makes go to the grassroots level of the population, has a staff of about 11,000. Not included in this figure are those working in groups and centers who spend a great deal of time initiating and following up each individual loan. The groups hold weekly meetings in which participation of all the members is compulsory. With this level of staff input the Grameen Bank lends under $400 million a year.

In addition to being expensive, it is not clear that grassroots participation is appropriate for all types of rural infrastructure. As discussed in chapter two, RI is a very heterogeneous field, and the level of decentralization appropriate for a gravity-fed water supply system serving a handful of families is unlikely to be appropriate for a secondary road serving a large rural area. In the first case direct involvement of the beneficiaries may be desirable, while in the second case involvement would have to be through traditional or elected representatives. The link between the number of beneficiaries and their role in the decision-making process is not insignificant. In formulating this link, it is useful to keep in mind some of the basic principles of collective action that can be expected to occur quite naturally in small groups, but pose more problems in larger groups (box 2).

While the groups involved in small-scale rural infrastructure fall into the small-group category, many other types of RI fall into the larger-groups category and face the problems identified by Olson. The most important prob-

Table 12 Responsibility by level of government and beneficiaries (percent)

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Central government</td>
<td>96</td>
<td>95</td>
<td>97</td>
</tr>
<tr>
<td>Regional/provincial government</td>
<td>10</td>
<td>45</td>
<td>60</td>
</tr>
<tr>
<td>Local and municipal government</td>
<td>33</td>
<td>32</td>
<td>63</td>
</tr>
<tr>
<td>Beneficiaries</td>
<td>0</td>
<td>5</td>
<td>40</td>
</tr>
</tbody>
</table>

Note: The table refers to involvement in the project as a whole, not only in the infrastructure component. However, in most cases, involvement in the project as a whole and in its infrastructure component is the same.
Box 2 Privileged, intermediate, and latent groups

A "privileged" group is a group such that each of its members, or at least some of them, has an incentive to see that the collective good is provided, even if he has to bear the full burden of providing it himself. In such a group there is a presumption that the collective good will be obtained, and it may be obtained without any group organization or coordination whatever. An "intermediate" group is a group in which no single member gets a share of the benefit sufficient to give him an incentive to provide the good himself. Nor does it have so many members that no one member will notice whether any other member is or is not helping to provide the collective good. In such a group a collective good may, or equally well may not, be obtained, but no collective good may ever be obtained without some group coordination or organization. The analog to atomistic competition in the non-market situation is the very large group, which will be called here the "latent" group. It is distinguished by the fact that, if one member does or does not help provide the collective good, no other member will be significantly affected and therefore none has any reason to react. Thus an individual in a "latent" group, by definition, cannot make a noticeable contribution to any group effort, and since no one in the group will react if he makes no contribution, he has no incentive to contribute. Accordingly, large or "latent" groups have no incentive to act to obtain a collective good because, however valuable the collective good might be to the group as a whole, it does not offer the individual any incentive to pay dues to any organization working in the latent group's interest, or to bear in any other way any of the costs of the necessary collective action.

Only a separate and "selective" incentive will stimulate a rational individual in a latent group to act in a group-oriented way.


Even in the smallest groups, however, the collective good will not ordinarily be provided on an optimal-scale. That is to say, the members of the group will not provide as much of the good as it would be in their common interest to provide. Only certain special institutional arrangements will give the individual members an incentive to purchase the amounts of the collective good that would add up to the amount that would be in the interest of the group as a whole. This tendency toward sub-optimality is due to the fact that a collective good is, by definition, such that other individuals in the group cannot be kept from consuming it once any individual in the group has provided it for himself. Since an individual member thus gets only part of the benefit of any expenditure he makes to obtain more of the collective good, he will discontinue his purchase of the collective good before the optimal amount for the group as a whole has been obtained. In addition, the amounts of the collective good that a member of the group receives free from other members will further reduce his incentive to provide more of that good at his own expense. Accordingly, the larger the group, the farther it will fall short of providing an optimal amount of a collective good.

Decentralization to the lowest level may therefore be neither feasible nor desirable; intermediate levels of interventions or decisionmaking are bound to be necessary.

In addition choosing the appropriate level of decentralization seems to be a function of the facet of the decisionmaking process being addressed. RI investments, like other types of investments, go through the standard phases of the project cycle: identification, preparation, appraisal, construction, maintenance and operations, and replacement or improvement. At each of these stages the process raises a wide
Decentralization Is Necessary

variety of issues, such as dissemination of information, analysis, training, or financing. The most appropriate level of decentralization at the preparation phase may be quite different from that at the O&M phase, and the most appropriate level of decentralization in regard to financing issues may, similarly, be quite different from that appropriate for dissemination. Some may be best dealt with at the beneficiary level, while others are more appropriately handled at much higher levels.

The Grameen Bank again provides a good illustration of a wide variety of levels of decentralization. The bank has four distinct administrative tiers (head office, zonal office, area office, and branch) and, in addition, its borrowers are organized into two tiers (the group and the centers, each including eight groups) thus adding up to six distinct levels of decisionmaking. Fundraising, as expected, is carried out at the highest level. But other activities occur at higher levels than might be expected. For example, loan approval, which, in keeping with the Grameen Bank's philosophy, might be expected to take place at a grassroots level, actually occurs at the area level; that is, four levels up from the bottom. A close look at other aspects of the Grameen Bank reveals other evidence of careful choices aimed at avoiding collusion and increasing accountability. While no strict parallel between the structure of the Grameen Bank and the structure of institutions dealing with RI investments can be drawn, the Grameen Bank's success is probably a good indicator of the need for a careful assessment of the level of decentralization to be applied to various facets of RI investments.

While there are no hard-and-fast rules about what ought to be done at what level, current practice seems to point to:

- As much decentralization as possible with regard to investment choices, particularly relating to design standards
- As much decentralization as possible with regard to operation
- A significant level of decentralization on engineering and contracting issue, as compatible with technical competence at the local level
- A lower level of decentralization on financing, largely because of the large contribution from central government and the need to "ration" financing at the national level.

A key unresolved area is maintenance. Other than the two extreme cases of the power sector and similar instances in which maintenance can be entrusted to a strong agency, and the case of small-scale infrastructure serving a very small group of beneficiaries, there is no single model for success to draw from. It is possible that less, rather than more, decentralization may be conducive to better maintenance prospects.

Decentralization Must Be Carefully Crafted

As should be obvious from the previous section, the main conclusion of this chapter is that the decentralization of responsibility for rural infrastructure is a difficult issue demanding carefully crafted solutions. The more promising solutions are complex. For example, the system that is emerging in the management of rural roads in Zambia involves many actors and very different levels of government. Technical work is carried out by private-sector consultants reporting directly to local authorities. However, they are not hired directly by these local authorities, but rather by the National Roads Board, as a result of a broad agreement with the Association of Consulting Engineers of Zambia. On the financing side, local businesses have created a system of complementing central government financing for works of local interest. Well thought-out systems are striking in the extent to which they tailor the depth of decentralization required for a particular activity to the local environment—including factors such as the level and source of professional competency, the source and likelihood of corruption, and the risk of patronage. Many of these factors go beyond "drawing an organigram on a piece of
paper,“ and fall into the realm of the institutional economics considerations discussed in the next chapter.

Notes


Social Capital, Accountability, and Commitment

Social Capital

In his research on differences in the relative growth of various regions in Italy, Robert Putnam concluded that the explanation rests neither on physical nor human capital alone. The differences can be explained only if one introduces, as a third element to the equation, "social capital," which, in a chapter entitled "Explaining Performance," Putnam relates to the notion of "civicness."

So strong is this relationship that when we take the "civicness" of a region into account, the relationship we previously observed between economic development and institutional performance entirely vanishes. In other words, economically advanced regions appear to have more successful regional governments merely because they happen to be more civic. . . . Regions with many civic associations, many newspaper readers, many issue-oriented voters, and few patron-client networks seem to nourish more effective governments.¹

In the same vein the new institutional economics brings out the importance of informal constraints, and the difficulty that may be encountered in bringing them in line with the formal rules. As Douglas North points out:

We do know that cultural traits have tenacious survival ability and that most cultural changes are incremental . . . . Equally important is the fact that the informal constraints that are culturally derived will not change immediately in reaction to changes in the formal rules. As a result the tension between altered formal rules and the persisting informal constraints produces outcomes that have important implications for the way economies change.²

The importance of these informal constraints stems from their pervasiveness; again, as pointed out by North:

In the modern world, we think of life and the economy as being ordered by formal laws and property rights. Yet formal rules, in even the most developed economy, make up a small (although very important) part of the sum of constraints that shape choices; a moment's reflection should suggest to us the pervasiveness of informal constraints. In our daily interaction with others, whether within the family, in external social relations, or in business activities, the governing structure is overwhelmingly defined by codes of conduct, norms of behavior, and conventions.
Underlying these informal constraints are formal rules, but these are seldom the obvious and immediate source of choice in daily interactions. Whatever name we may give to this “soft” aspect of development, whether it be “social capital,” “civininess,” or “informal institutions,” it is a pervasive aspect of economic development. It affects rural infrastructure projects in a critical way, and probably more so than many other projects because so many of them rely on grassroots organizations, for which informal rules and traditions are crucial. Many of the successes and failures discussed in chapter 2 can be related to these “soft” institutional economic issues. The Korea rural infrastructure project, which by normal standards was far too complicated, was actually very successful because it built on a well-established grassroots movement. By contrast the Mexico Chiapas rural roads project, which was otherwise very well conceived, failed because the project rules were at odds with prevailing practices. Rural electrification projects convey a stronger sense of sustainability than most other types of rural infrastructure because there are relatively few discrepancies between the formal rules by which a power company is expected to abide and the prevailing informal constraints. Finally, rural water projects have been reasonably successful because they have traditionally put considerable emphasis on building up traditional community organizations.

In the past these “soft” aspects of RI seldom received much attention, and when they did, it was often in terms of ways to get “around” them. But this trend has begun to change, not only in terms of the degree of emphasis that informal institutional issues receive, but also in terms of the angle from which they are approached. Social capital is no longer necessarily seen as only an historical heritage—the perception that many get from Putnam’s work—but as a form of capital like any other, amenable to being invested in and built up. The informal rules of traditional society are no longer seen merely as constraints to be circumscribed, but as rules that may contain the seed of increased potential for sustainability. The rest of this chapter addresses these issues in terms of what can be done to improve long-term commitment to, and accountability for, rural infrastructure.

**Increasing Beneficiaries’ Commitment**

The starting point in building up beneficiary commitment is to involve them in the decision-making and implementation process. In the recent past many World Bank operations have put considerable emphasis on beneficiary participation; rural infrastructure has been no exception. While in the 1970s and 1980s, only about 20 percent of all RI projects included some form of beneficiary participation, over the last three years this percentage has increased to over 50 percent. More importantly, the nature of the participation process has changed dramatically. In the 1970s and 1980s when there was participation, it was almost always in the form of a “consultation” process. The agency responsible for project implementation would make a determination of where RI was needed and would consult the beneficiaries before implementing it. Except in cases where the beneficiaries were expected to make a contribution to the project (usually in the form of labor), this consultation process had very little meaning, as the intended beneficiaries would have been foolish to decline the investment and they had no say in design standards or other aspects of the project. In the 1990s consultation was no longer the prevailing mode of participation, and beneficiaries were expected to take a much more active role in the process. This more active role takes various forms, such as initiating the request for assistance (as opposed to responding to a government agency request for an expression of interest), deciding on design standards, or choosing from various types of RI, as, for example, in the case of the recent Indonesia Village Infrastructure Project.

A more recent development is the reinforcement of beneficiaries’ empowerment by the acid
test of their willingness to contribute an increasing share of project cost (table 13). Over the last three years, there was a strong link between participation and financial contribution of the beneficiaries, with strong participation being backed up by a much larger contribution to the investment cost.

The rationale is made clear in the Pakistan North/West Frontier Community Infrastructure Project (NWFP). As stated in the appraisal report:

A principal reason for requiring communities' and local council's capital contributions would be in order to ensure that both have a voice in design and implementation. . . For the contribution to be effective in achieving these objectives, it needs to be collected, and hence the community contribution would be up-front.4

The grassroots financial contributions to the NWFP project are respectively 20 percent for beneficiaries and 10 percent for local councils. Similarly, in Bolivia, the Rural Communities' Development Project requires a 20 percent contribution from beneficiaries, and the Rural Water and Sanitation Project combines a 17 percent contribution from the beneficiaries with a 22 percent contribution from municipalities. It is too early to tell whether these higher levels of financial contributions will have an impact on implementation and sustainability. Only two of the earlier-generation projects provided for significant beneficiary financial participation: the China Rural Water Project in the 1980s and the Korea Rural Infrastructure Project in the 1970s. The first required a 17 percent financial contribution and the second an even higher one, ranging from 40 percent for roads, 25 percent for water supply, and 12 percent for power. While both these projects turned out to be successful, with a high probability of being sustainable, this is far too small a sample from which to draw operational conclusions on the specifics of the link between beneficiary financial contributions and project success. In particular, it is not clear whether the financial contribution is merely an indicator of beneficiary commitment, or whether beneficiary commitment can actually be strengthened through increased financial contributions. Nor is it clear what the desirable level of participation ought to be. Hopefully, the new generation projects, with their increased emphasis on beneficiary financial contribution, will soon yield useful lessons on this important topic.

The importance of significant financial contributions is confirmed by the findings of recently completed research on the sustainability of rural water projects. On the basis of extensive beneficiary surveys, the study concluded that in most projects beneficiaries were not aware of how much they had contributed to project cost, and that in fact, had a very poor idea of what actual project costs were:

In all communities people reported making some kind of contribution toward the system, either in cash or in kind. However, households often disagreed with each other and with the water committee about how much they had contributed. Less than a third of the households knew the total value of their cash and in kind contributions. In several communities, households reported paying as much as three times the per capita cost of the system.5

The few projects that did manage to establish a link between what people pay and what they receive were those in which the financial contribution was substantial. This was the case in three of the 10 projects reviewed, for which contributions were on the order of 20 to 55 percent of construction costs.
Improving Agency Commitment

While beneficiary empowerment is most likely the key to securing commitment in the case of small to very small RI projects, it is much more difficult to organize in the case of larger investments that benefit a number of communities, and that may have a network effect or require more complex engineering. In these cases the commitment of the agency sponsoring the investment is just as crucial as that of the beneficiaries.

Much has been made of the undue complexity of early-generation rural development projects; the failure of the approach has often been tied to the “Christmas tree” design of the projects. However, the projects reviewed in this study do not reveal any clear evidence that the multiplicity of components in and of itself, or the number of implementing agencies, bears any relationship either to the physical or sustainability outcome of such components. But the review does point to a strong link between outcome and the ability of the agency in charge of the project to secure the commitment of sectoral implementation agencies. For example the audit report on the Mexico Integrated Rural Development Project (PIDER) links problems in project implementation to the inability of project management to secure the support of participating agencies, which successfully resisted efforts by PIDER to directly intervene in their activities. Similarly, the audit report on the 1976 Bangladesh Rural Development Project relates delays in project implementation essentially to the weakness and lack of commitment of the participating agencies.

The commitment problem is not limited to rural development projects in which a central agency has to secure the services of other agencies or ministries. It is also an issue in the case of single-sector projects implemented by an agency responsible for both trunk and secondary infrastructure, or both urban and rural infrastructure. The glamour of large investments, or the high visibility of infrastructure problems in urban areas, can easily distract these agencies from rural needs, which end up assuming secondary priority or not getting the special attention they need. For example, the project completion report on the Tunisia Seventh Water Project attributes the poor performance of the national water company in rural areas to its lack of interest in adjusting or adapting its operational style to the specific circumstances of rural areas.

The appraisal report on the Indonesia Second Rural Electrification Project echoes similar concerns:

The commingling of management responsibilities for two distinct missions, i.e., RE [rural electrification] and non-RE operations, that require different technical solutions and management approach and culture, and with vastly divergent financial incentives, compromises the performance of PLN’s [State Electricity Corporation] RE as well as its urban industrial operations. RE operations by their very nature—smaller and dispersed loads, more labor-intensive, lower capacity utilization and relatively speaking representing the “low tech” end of the electricity supply business—impose a significant higher investment and operating cost burden, and hence require a subsidy. By contrast, PLN’s urban-industrial electricity operations are largely commercial in nature and profitable. As rural electrification coverage expands and with each new household connection, the financial pressure on PLN increase, creating direct conflicts in objectives.

Under the present mixed management model and an environment marked by conflicting priorities, rural electrification inevitably takes a back seat. With the span of control of each top manager spread between RE and non-RE, the span of attention given to RE is limited.

Clear Assignment of Responsibility

The root cause of the commitment problem can sometimes be a simple issue of administrative
accountability: nobody is quite clear who is responsible. For example, in the earlier generation projects, the appraisal report on the Malawi Second Highway Project noted that, in addition to the 6,750 miles of classified road network there were several thousand miles of tracks that were not only unclassified, but for which nobody had responsibility.

While this may be an extreme case, appraisal reports tend to pay relatively little attention to who, if anybody, actually has responsibility for different types of RI and whether existing arrangements are adequate. The emerging trend is to correct this situation. The fiscal 1994 Ghana Community Water and Sanitation Project goes into the role and responsibility of all the actors involved in rural water in great detail. It covers water user associations, water user groups, district water and sanitation teams, and district assemblymen, as well as regional and national agencies. Similarly, in the transport sector, recent Albania and Peru projects are good examples of attempts to define very clearly who has the responsibility for what type of roads.

Creating Specialized Departments or Agencies

Beyond making sure that accountability for rural infrastructure is clear, and that the role of all the actors concerned is well-defined and well thought out, the most traditional and widely used method of increasing commitment has been to promote the creation of departments or units dedicated to RI within agencies with broad infrastructure responsibility. Almost all energy projects follow this model, and many highway departments have specific units dedicated to rural roads. The creation of these dedicated units was a central objective of the feeder roads projects financed in Africa in the 1980s. They were originally conceived as units that would oversee the construction of rural infrastructure, but, as time went by, it became clear that maintenance was a major problem, so their mandate was expanded. While their effectiveness was strongly linked to the availability of financing, so long as maintenance was financed by external sources the arrangement worked well, and most projects reported satisfactory results.

An alternative to the creation of dedicated units within agencies is that of creating national institutions specializing in promoting rural infrastructure. Box 3 illustrates the institutional set-up in Bangladesh, where a Rural Electrification Board is in charge of rural electrification at the national level, while various Rural Electrification Cooperatives (PBSs), manage electricity distribution at the local level. An attempt to following a similar approach for roads in Brazil in the 1970s was made according to which funds for rural roads were channeled through the national development bank, which was responsible for evaluating projects requiring financing. This attempt was abandoned in the 1980s, when decentralization of road management was increased, and it is therefore difficult to assess how useful this particular model might be in the roads sector. However, it did work well while it lasted. The current trend towards financing RI through social funds may be seen as yet another version of this approach.

Allowing “Takeovers”

While the last section of this chapter argues for gradualism, and would implicitly favor building up existing institutions over creating new ones or dramatically changing the responsibilities of existing ones, building up agency commitment may be made easier by keeping a degree of flexibility in the responsibility of various agencies, so as not to thwart leadership. Judith Tendler, in her review of the northeast Brazil Rural Development Projects, links success to some form of “takeover” of the responsibilities of one agency by another.

Dynamic and successful agency managers almost always took over tasks from other agencies meant to carry them out. The project unit in Bahia took over the rural-road component from the road-building agency; Piauí’s project unit...
Box 3 Rural Electrification Cooperatives

Many rural electrification cooperatives are patterned on the U.S. model in which: "loan funds [were] provided by the government under the New Deal politics of the 1930s. The U.S. cooperatives have traditionally seen themselves in an egalitarian perspective. They were established not only to extend power service to the largely unelectrified rural areas of the U.S., but also to provide small farmers with collective bargaining power in their dealings with generation and transmission companies, which in the U.S. are largely private."¹

In Bangladesh consumer cooperatives (PBSs) are under the oversight of the Rural Electrification Board (REB), a government entity responsible for the initiation, planning, and implementation of rural electrification schemes within the framework of the rural electrification master plan. The REB's responsibilities include: (a) arranging finance for rural electrification schemes, (b) construction of new distribution systems and rehabilitation of existing schemes, (c) organizing prospective consumers into PBSs and prescribing their by-laws, (d) establishing technical and administrative standards for the cooperatives, and (e) approving their tariffs.

The PBS system consists of member-owned autonomous entities for electricity distribution in rural areas. A PBS's initial Board of Directors is selected from local communities, subject to the approval of the REB Board of Directors. After their appointment the directors register the PBS with REB, and proceed to promote PBS membership among potential electricity consumers. The Board of Directors consists of 10 to 15 members elected by an annual members' meeting. Eligibility to become or remain a director includes being a bona fide member of a PBS and a resident of the area. Any person or organization in a PBS area may become a member of the PBS, following acceptance by the Board of Directors and payment of the membership fee.

Foley attributes the success of the similar cooperatives in Costa Rica to:

- Good training
- Cost recovery mechanisms (While funds were made available for investment financing at below-market rates, there are no operating subsidies.)
- Management autonomy, under the competent supervision of the Servicio Nacional de Electricidad, which stresses the need for financial auditing and maintaining proper administrative procedures.²

2. Ibid., 19–22.

But common sense and experience with many "white elephant" operations clearly indicate that leadership alone and automatic

took over rural water supply from the water agency and, in an earlier period, kept control over the land-acquisition component long after a state land agency was set up to carry it out; Paraíba took over rural road construction from that state's road agency; in several states, project units spearheaded initiatives to provide credit to small farmers in a way that circumvented the central role assigned to the official banking system for this task—namely, the Central Bank, the Bank of Brazil, and the Bank of the Northeast . . . Though the units set up to coordinate the Northeast projects were responsible for many of the takeovers, dynamic managers in already-existing agencies with executing responsibilities also took over responsibilities belonging to other agencies. In the Ibiapaba project of Ceará, the extension service took over the sitting of rural roads from the road agency; Ceará's federal land agency took away land-settlement activities belonging to the state land agency, as well as agricultural-extension tasks belonging to the extension service; Bahia's federal land agency took over land-demarcation and parceling activities from the state land agency; Sergipe's rural water agency took from the state power utility the responsibility for supplying small irrigators with the transformers, the cost estimates, and the design work for connecting them up to the power network.³
"takeovers" are not a recipe for success. Initiative has to be left to develop, but it also has to be balanced by good engineering and overall good project design. Furthermore, while the relative weight of personal initiative or political will seems important at the construction phase, it is not clear that it remains as much of an asset at the O&M phase. Judith Tendler observes, somewhat casually, that 50 percent of the water projects that she considers to have been successful were no longer operating five years later. This suggests that while individual leadership may be the key factor in getting projects built, O&M is more dependent on strong organizations. The case for "takeovers" of the type described in Brazil must therefore be balanced by the need for long-term continuity.

**Strengthening Interaction between Beneficiaries and Agencies**

The two previous sections address cases in which either beneficiaries are able to take matters into their own hands and take charge of their infrastructure needs, or these needs can be met by a well-functioning agency or government department. The first case is likely to be limited to very small-scale infrastructure, while the second is more likely to apply to larger investments. There are many types of rural infrastructure that fall between these two extremes and involve both beneficiaries and an agency. In addition to strengthening both beneficiary and agency commitment, the question in such cases is whether anything can be done to strengthen the interaction between the two. None of the operations covered in this review explicitly address this issue, but some initiatives lean in this direction and could probably be developed further.

**Performance Indicators**

Performance indicators are now mandatory for all World Bank projects, and some of those used in recent rural infrastructure are particularly well thought-out. While they are intended essentially as project implementation monitoring tools, they could easily be used for the broader purpose of increasing the accountability of implementing agencies toward beneficiaries or their representatives. The following quote from a recently published report on the decentralization experience in Latin America and the Caribbean, while it refers to decentralization experience in the urban sector, would apply just as well in rural areas.

The Audit Commission of Great Britain exemplifies how regularly published information can be used to promote efficiency. The Audit Commission publishes unit cost comparisons, as well as service quality indicators, for the entire range of local public services—from refuse collection and vehicle maintenance to school test results and government overhead rates. The data provides a context for judging the quality and costs of services in any one jurisdiction... Within Latin America, Chile pioneered this kind of public service disclosure.

If this dissemination of performance indicators can be made to work in Chile, it can certainly be made to work in a number of other countries—at least in the more advanced countries—and could prove to be a powerful tool to increase the commitment of implementing agencies to efficient delivery of rural infrastructure.

Using performance indicators as a tool to empower beneficiaries may go together with a shift in the role of government away from control and toward the provision of accurate information. Elinor Ostrom illustrates this point in her analysis of the Los Angeles area groundwater management experience:

The water-master in each basin has extensive monitoring and sanctioning authority. Monitoring activities are obvious and public. Every year, each party reports total groundwater extractions and receives a report listing the groundwater extractions of all parties (or any-
one else who has started to pump). The reliability of these records is high. Several agencies cross check the records. The water-master is authorized to calibrate all meters, thereby reducing the probability of one form of cheating. Given the accuracy of the information and its ease of access, each pumper knows what everyone else is doing, and each knows that his or her own groundwater extractions will be known to all others. Thus, the information available to the parties closely approximates "common knowledge", so frequently a necessary assumption for solutions to iterated dilemma games (Autmann 1976) . . . Instead of perceiving itself as an active policing agency, the water-master service tries to be a neutral, monitoring agency. Because anyone who possesses a legal water right can initiate a court action to enforce complete reliance to the judgments, the water-master does not need to initiate punitive action against non-conformers.9

This limitation of government's role to that of "neutral, monitoring agency" may not be practical for many World Bank borrowers, but the potential for local communities to argue their case, if given objective information, should not be underestimated. For example, Judith Tendler comments as follows on the involvement of the national development bank in feeder roads in Brazil:

The incentives and pressures with which the road fund surrounded the road agency and the municipalities can reduce considerably the burden placed on formal monitoring to deal with problems of cost, delay, inappropriate standard of materials, and plain wrongdoing. The road fund, in effect, shifted some of this burden to outside parties—the municipalities who didn't even have to be paid to do it because it was very much in their interest, and who could identify potential savings in a way that was difficult to do in a formal appraisal process.10

The use of performance indicators as a way to strengthen the interaction between agencies and beneficiaries should therefore be conceived in the context of a more passive role for government that puts more emphasis on the provision of objective information than on control.

Beneficiary Associations

Another vehicle for strengthening the beneficiary agency interaction introduced recently, but limited to the transport sector, is the creation of "road boards." Road Funds have long been used in road projects, essentially as an attempt to ensure regular maintenance financing. They center around a system to bypass the traditional budget process, and ensure that road-user taxes find a more direct way into a bank account that highway administrations can readily use to finance maintenance. Usually effective during the first couple of years, the long-term performance of these funds has been mixed at best. After a few years, in periods of great budget stringency when the Road Fund would really be needed, the mechanism tends to break down, and the Fund does not meet its intended objective. While similar to the old concept on the financial side, the new generation of Road Funds hinges on the creation of "Road Boards" that exercise considerable power over the funds. Board members are carefully selected and include road-user representatives of standing in the country. While the creation of Road Boards is relatively new, and it is still early to tell whether they will have a decisive long-term impact on the perennial problem of funding maintenance, so far they have proved to be effective tools in bridging the gap between beneficiaries and government. Although they do not distinguish between rural and other roads, they should have an impact on both.
To some extent Road Boards are a special form of beneficiary associations, which are yet another potential way to strengthen the beneficiary-agency interaction. While none of the projects reviewed promoted beneficiary associations directly and openly, a few did so indirectly, particularly those that rely extensively on NGOs for implementation. The recent India Uttar Pradesh Rural Water Supply and Environmental Sanitation project, or the Bolivia Rural Communities Development project are good examples of projects with heavy NGO participation, which can be expected to strengthen the voice of beneficiaries. In the Bolivian case the NGOs are already organized into networks, which should further enhance their weight in the decisionmaking process. Independently of how far they go on the advocacy front, user associations can play an important role in the dissemination of best practices, and it is surprising that they do not receive more weight in Bank operations. “Horizontal networks” are an important component of social capital; promoting them could be a simple way of building up this form of capital.

Policy Consistency and Continuity

It would appear that building up commitment is too difficult a process to risk destroying whatever commitment may initially be present. Yet, the review of past experience shows that this happens frequently; the main culprit is lack of consistency and continuity in policies. This observation echoes one of the central points of a 1995 review of the World Bank’s Africa Region experience with rural infrastructure:

There is little doubt that the lack of consistency [in the World Bank’s approach] in this respect has, over time, led to a loss of overall focus of project efforts. If there had been overall strategies towards rural infrastructure at the national levels, this would not have mattered much since each project component would have been formulated within the relevant strategy in mind; however, there are not many national strategies available, and those which are, are rarely followed. The dispersion of Bank’s efforts in rural infrastructure over many sectors and over many lending instruments is therefore of significance in reducing the long-term effects of these efforts.¹¹

One of the most striking examples of the destructive impact of policy inconsistency is the Chiapas Rural Roads Project in Mexico. As pointed out earlier, this project was a resounding failure, which the completion report attributes largely to the inconsistency between the complexity of the subprojects selection criteria used by the project, in comparison with criteria used for government funding of similar investments. There are many other such examples. The completion report on the India Kerala Water Supply Project notes that the demand for latrines in some parts of the project areas was reduced because of the parallel availability of subsidized Government of India programs that offered larger and often substantial subsidies. In the case of the 1976 Senegal Feeder Roads Project, the completion report puts the blame for the inability of the specialized unit created to deal with feeder roads (BPP) to assume this responsibility on another donor, which was financing roads to standards inconsistent with those promoted by BPP. The recent report on rural roads in Africa shows that disparities in donor’s lending requirements is still a major impediment to policy consistency:

To conclude, few countries have a coherent set of standard criteria to apply to rural road projects nationwide. Most local government road units simply adhere to conditions that will trigger funding for capital works. Donors provide the lion’s share of funds for capital expenditures on rural roads and most focus their support on one district or region of a country. In a country there may
be as many planning methodologies as donors. As a result, it is not unusual that a central sector ministry finds itself applying different prioritization criteria to the same network. This complicates and confuses planning and is a serious drain on scarce resources. The formulation of a government rural transport strategy should bring increased consistency by providing a planning framework and a methodology that all stakeholders can comprehend, identify with and apply.

Lack of policy continuity has an equally destructive impact. For example, the audit report on the Thailand 1976 Northeast Rural Development Project points out how easily a commitment can be undermined by a change in government policy. The project foresaw that villagers would contribute labor to maintenance. However the “Office of Accelerated Rural Development” continued to assume responsibility for maintenance and, as a result, the villagers’ contribution never materialized. Their motivation to participate was further undermined by government-sponsored programs, such as the “Rural Job Creation Program,” which provided remuneration for maintenance works of this nature. As a result the likelihood of maintenance taking place is strictly related to the availability of government financing, thus undermining the project objective and casting doubts on the sustainability of the project investments.

There are no simple solutions to these problems. Obviously the impact of glaring inconsistencies, as in the case of the Chiapas project, ought to be anticipated. But change is an integral part of most operations; many projects are conceived as pilot operations that will have important long-run demonstration effects but be at odds with prevailing policies or practices in the short run. In addition many changes in RI policies reflect deeply rooted divergences of views as to whether rural infrastructure should be considered a social necessity or an economic requirement. Such differences of opinion are unlikely to disappear in the near future. The resulting “oscillations” undermine the sustainability of cost-recovery policies, cost-sharing arrangements, and long-term commitment to maintenance, but they have to be contended with. The key lesson is not to underestimate the importance of their potential destructive impact. This lesson is particularly relevant to the change process issues discussed in the next section.

Change Process

Although radical changes may sometimes be required, the World Bank’s experience seems to point to gradualism as the preferred approach, and to thinking in terms of a process rather than a one-time effort to develop a final blueprint. The organization of the Grameen Bank described earlier was not conceived of in advance, but rather evolved as the institution expanded. Initially, the Bank was a two-level organization with only a head office and branches. As it grew and the need arose, the zonal and area offices were added and their functions clearly delineated. But the starting point was a working scheme, and it was the need to keep it working that determined the structure rather than the other way around. Similarly, a review of a provincial program in the province of Mendoza, Argentina, attributes part of the success of the program to its starting with “a simple, single-purpose organization at the grassroots level formed around commonly felt needs.”

This approach is contrasted with Peru’s “massive frontal assault” through a “gigantic social fund.” This view is shared by many and well summarized by Klitgaard:

Most institutional reforms will need to learn as they go. Blueprints are simply too difficult. Framing adjustment efforts as “experiments” emphasizes the learning. It also suggests measurement after a specified period of time, which is also welcome. There are exceptions to these generalizations. Sometimes, in order to be credible and effective, change must
be system-wide and sudden, without the announced prospect of changing again after an experimental period. But with regard to institutional adjustment, my experience is that it is wise to begin in carefully defined sectors with efforts that may be criticized for being “too simple,” but from which lessons can soon be drawn and improvement made. Doing too many sectors with too complicated a system is theoretically preferable but practically perilous.\textsuperscript{14}

The case for gradualism seems to be stronger the smaller the scale of the infrastructure and the greater the direct involvement of beneficiaries. The more grassroots the project, the more pervasive informal constraints are likely to be. But, as pointed out earlier, the implicit or explicit rules prevailing in local communities need not be seen only as constraints. The stamp of many successful operations is their ability to turn what could be perceived as major hurdles to accomplishing change into springboards for new approaches. For example, the project audit report on the Burkina Faso Second Rural Development Fund Project attributes the project’s success to its ability to adjust to traditional village social structure. It gives credit to the appraisal team’s resistance to pressure to establish cooperatives, relying instead on strong village organizations that entrust village chiefs and councils with administrative powers.

The Thailand Rural Electrification Program is another typical example of how to build on existing local structures to achieve an objective that often proves elusive, such as bill collection:

One innovation was that PEA hired local respected individuals to collect on bills. Typically, PEA hired a schoolteacher, village head, or village elder who was required to post a security deposit or bond. The bond could be based on land holdings or future salary (for government employees), and it acted as guarantee that the bills of the village would be collected and paid. As of July 5, 1994, there were 6,035 local persons collecting monthly bills in various villages throughout the country. Compensation for this activity is 5 percent per bill with a maximum of 4.50 Bath (US$.18) and a minimum of 2.00 Bath (US$.08) per bill. PEA is planning to use this bill collection technique throughout the country. . . At present only about 10 percent of the villages in the country pay their monthly bill via these local bill collectors, but this method has proved to be very successful. The company’s costs for bill collection and accounts receivable among these rural village customers were reduced significantly. Furthermore, non-technical losses, including delinquent accounts and non-payment among village customers, and from illegal connections, were also reduced. Currently, the company has a rate for non-technical losses of only 6.1 percent.\textsuperscript{15}

The positive outcome of recent rural water projects can similarly be related to their efficiency at building on existing village structures to achieve good O&M. Most of these projects involved the creation of some form of water committee, and there is an interesting link between the composition of these committees and the project success. At the inception phase they need a strong and well-connected promoter, capable of building support for the project and securing financing. But subsequently, when the issues faced are maintenance, tariff collection, or water rationing the need shifts to good administrative skills. At this stage water committees, which include a good cross-section of community leaders (almost always the school teacher and leaders of other initiatives such as children’s health, local craft promotion, or girls’ education), tend to be better able to cope and convey a much stronger sense of sustainability than those dominated by a single promoter or including a random cross-section of community members. The composition of the water committees, like that of any other benefi-
Beneﬁciaries are often skeptical of new initiatives and suspicious of whether the promises they count on will actually be fulﬁlled. Successful change is therefore often linked to “showing results.” The audit report on the Burkina Faso project mentioned above cites this as a factor in the project’s success, noting that participation by the local population in project works increased considerably as project beneﬁts became apparent. This link between the change process and the importance of producing visible results is also emphasized in Tendler’s review of Northeast Brazil cited earlier, in which she observes that, in successful operations:

One or two project components were elevated to center stage. A governor chose a “signature activity” from the project’s myriad activities, and supported it lavishly. . . .

The weight put on “signature activities” can easily be overdone and, as Tendler shows in the case of Brazil, lead to overemphasizing investments for which politicians can show results before they have to run for re-election. A balance must be struck between showing results and making the optimal decision. Recent operations seem to indicate that at present the pendulum needs to move toward putting more emphasis on results.

The worst possible scenario is to wait a long time for results and, when they start to materialize, shift course. For example, in the case of the 1975 Burkina Faso Rural Road Project, the audit estimates that results were expected too quickly and that, when they ﬁnally started to materialize, the Bank wrongly condoned a decentralization of the highway administration, which undermined them. The combination of complexity and haste is problematic for most operations and particularly destructive for many RI projects, for which results and beneﬁciary participation are key.

Notes

3. Ibid., 36.
10. Ibid., New Lessons, 36.
CHAPTER 5

Rural Infrastructure and Poverty

As pointed out in the introduction to this volume, the poor almost always suffer the most from lack of infrastructure. However, while poverty alleviation is consistently a key objective of rural infrastructure investments, the question of how to ensure that the richer members of the rural population do not "highjack" the bulk of benefits is far from clear.

**Poverty Alleviation through Rural Infrastructure Is Not Automatic**

In his evaluation of the earlier generation of rural development projects Vernon Ruttan notes:

Community development programs were criticized for failing to improve the economic and social well-being of rural people. The criticism was also made that failure to reform the community power structure led to local elites capturing a disproportionate share of both the economic and political gains generated by the programs.¹

Reporting on a 1994 comparative analysis of decentralization in South Asia and West Africa by Crook and Manor (C&M), Parker reflects a similarly dim view of the impact of decentralization:

Democracy does appear to improve methods of accountability, although an important proviso to this statement is the impact on disadvantaged social groups. In their research, although C&M found that poor people or women did participate more under decentralized systems, they found no evidence that either poverty or gender issues received a higher priority in the development process.²

The latest OED evaluation of Pakistan’s Aga Khan project also emphasizes that participation will not automatically ensure that the poor get enough attention:

However, it is frequently the women of the most well-to-do households who are the most active, assume leadership positions, become specialists, and generally take advantage of the options presented to the group. Poor women, who are often the most in need of economic input for their households, may be excluded by other more powerful group members. There may also be a tendency for some WO social organizers (SOs) to give preference to more capable members so that a particular activity has a greater chance of success. Women of female-headed households are inclined to be in this potentially disadvantaged category and often do not join the WO. This is a difficult problem to address, but suggests that vulnerable households in a community should be identified by the
SO and special sub-projects developed to target this group on equity grounds.\(^3\)

In some cases the problem may be even more fundamental, and funds may not even reach rural areas, as for example was the case in northeast Brazil: "Less than one-third of project funds reached intended beneficiaries, the rest being absorbed by administrative expansion and overheads."\(^4\)

While long on examples of the link between lack of rural infrastructure and poverty, the existing literature is of limited analytical depth. Causality is always inferred but seldom, if ever, proven. Yet, while it is clear that poverty and lack of infrastructure go hand-in-hand, the extent to which improving infrastructure will relieve poverty is far less clear. Questions such as the following are indicative:

- Is there a direct relationship between poverty alleviation and the amounts invested in rural infrastructure; will investing twice as much on rural infrastructure have twice the impact on poverty, or are there thresholds beyond which impact is limited?
- How does the indirect impact of rural infrastructure affect the poor? Improving a rural road will reduce transport costs, which in turn, will lead to increased agricultural output. But the improvement may also improve the "reliability" of the transport system and reduce or eliminate the period of the year during which a village is isolated from neighboring towns, with their health and social services. This may make it possible to attract a better teacher, or a better extension service worker to the village. Such indirect impacts could conceivably have as much, if not more, effect than a reduction in transport costs. Will they affect the poor more, or less, than the nonpoor?

### Approaches to Poverty Alleviation

In spite of the paucity of well-researched material on the link between rural infrastructure and poverty, poverty reduction is an implicit or explicit objective of most RI operations and, as discussed in chapter two, is being addressed in an increasingly focused way. Approaches range from concentrating lending on regions with the highest levels of poverty, employment creation and subsidies, to empowerment of the poor.

#### Focus on the Poorest Regions

In many rural areas everybody is poor, and any investment that helps the local community will help the poor. So identifying particularly poor areas will go a long way toward meeting a poverty objective. The difference will be between having a poverty impact and optimizing that poverty impact, but the former can be significant in its own right. The amount of work required to identify poor villages can be substantial. For example, in the case of the Indonesia Village Infrastructure Project, villages were selected on the basis of a socioeconomic survey that considered three basic indicators and no less than 27 variables: village facilities and potential (10 variables), housing and the environment (eight variables), and population characteristics (nine variables). In a similar vein the Peru Feeder Roads Project links the financing of the lowest-cost roads (less than US$8,500 per kilometer) to the infant mortality rate and unsatisfied basic needs.

#### Employment Creation

In the early 1970s when the Bank started stressing labor-intensive construction methods, the motivation was largely economic: certain work could be done in a more cost-effective way by hand than by machinery, particularly when labor rates were in the vicinity of a dollar or two a day. Indirectly, this was seen as a way to reduce budget constraints by shifting part of the cost to local communities in the form of free labor contributions. In an environment in which cash contributions from local communities are difficult to secure, contributing to project cost through free labor was often also
perceived as a way to ascertain the level of community "commitment" to the investment. While the economic benefit of carrying out construction work through labor-intensive methods remains valid, and free labor contributions can be a sign of commitment to a project, current projects are putting more emphasis on the poverty-alleviation impact of employment creation than on the cost effectiveness of labor-intensive construction methods. This objective implies that labor be remunerated. Forty percent of the projects financed over the last three fiscal years provided for some form of labor-intensive construction work, and half of them required that this work be remunerated, rather than come in the form of community contribution. A good example is the Indonesia Village Infrastructure Project, which in addition to requiring that labor be paid, requires that it be provided by the community in which the project is implemented rather than by a pool of workers moving with the contractor from village to village.

There are many difficulties involved in managing labor-intensive work in general, and they are further complicated if one wants to maximize their poverty impact. In the African context a review of labor-based road construction puts a great deal of emphasis on organizational difficulties:

This paper has argued that the principal reasons why labor-based programs have difficulty expanding is that they: (a) are not ensured an adequate flow of funds; and (b) have been centralized, which has led to highly bureaucratic payment procedures and thwarted the strengthening of labor based constituency. Thus, to successfully expand labor-based programs, program designers must tap and secure funding over an extended period of time, and decentralize the program by delegating authority and financing down to the appropriate level. These two building blocks should be addressed before providing training or equipment. Organizational difficulties such as these are probably also related to the very existence (or lack thereof) of a tradition of labor-based construction methods.

Labor rates are another difficult issue. They should not be set too low, so that if the poor are to benefit, their work is rewarded. Nor should they be set too high, increasing the risk of hijacking of benefits by the better off or diversion of resources from higher priority activities in agricultural production. This aspect of labor-intensive work does not always get the attention it deserves, as noted in a safety net review for the Philippines:

The Philippines has more than two decades of experience with labor-based public works programs. Yet no synthesis of this experience has been completed and the database is thin. The principal problem with public works programs in general and with food-for-works programs in particular, is that the concept of targeting is poorly understood (and applied). For example, food-for-works programs were located in poor provinces, but the poor did not benefit because the effective wage rate (food plus money wages) was set too high; as a result, many nonpoor took advantage of the program.

Pricing

The interaction between the financial aspects of RI investment and poverty will be discussed further in chapter six. It seems clear that the poor often (if not always) will be better off if they have to pay the full cost of infrastructure than if they are dependent on an ill-advised and ill-administered subsidy system. The backfiring effect of ill-conceived subsidies to the poor, or taxes on the less poor, is well known. A recent review of rural energy strategies brings out the interesting case of Haiti which, by overtaxing households using gas for cooking, ended up depleting wood supplies and, indirectly, hurting the poor:
Haiti has among the highest LPG prices in the Caribbean, if not in the World, largely because of high taxes. Although few poor people in Haiti use LPG or kerosene, prices for fuels have historically been related. Hence, when LPG and Kerosene prices are raised via taxes, demand for other fuels increases. Massive deforestation over the past 25 years has depleted the country's wood supplies, so the poor use commercial charcoal, whose prices have risen with demand and along with those of other commercial fuels. The taxes on kerosene and LPG thus have meant higher prices for fuel used mostly by the poor.7

However, desirable as it may be, full cost recovery is an elusive objective for many types of rural infrastructure. Not only are rural communities poor, but providing infrastructure is expensive because of low-intensity use that can seldom be fully offset by concomitant reduction in design standards (a significant difference with similar investment in urban areas). The solution to this dilemma is far from obvious. In a few instances where RI is provided by an agency that operates both in rural and urban areas, there is scope for cross-subsidization. This is the exception rather than the rule, however. Of the projects financed over the fiscal 1993 to 1996 period, only three provided for some form of cross-subsidization, two in the water sector and one in the power sector. In the case of water projects, this approach is only feasible when water is being supplied by the same company in rural and urban areas, thus further restricting its applicability. In practice the only practical model that emerges is one in which subsidies go towards investment cost, while to the maximum possible extent, O&M cost are borne by the beneficiaries. The road sector is difficult to fit into this mold, because it does not lend itself to benefit taxation, and this goes a long way towards explaining the sustainability problem discussed in chapter two.

Shift from Participation to Empowerment

The realization that rural community consultation on rural infrastructure investments is not enough to achieve many RI investment objectives is increasing. The concomitant shift from consultation to empowerment may also open the door to new approaches to poverty alleviation, but only if the process can be designed in such a way that the poor are given enough "voice." As Binswanger put it in an address on the lessons from rural development:

Another lesson emerging from these experiences is that consulting the poor is not enough to empower them for their own development, even with the most genuine intentions. Nor is administrative and fiscal decentralization sufficient... Additional steps will be required:

- The first is earmarking of conditional or matching grant resources for poverty alleviating projects or programs and the delegation of their execution to poor communities, where technically feasible.
- The second is to strengthen the political representation of poor and disadvantaged groups in local political bodies, as has been done by reserving seats for women and scheduled and backward casts in the constitutional reform of the Panchayat Raj system in India.
- Where such constitutional changes are not feasible, as in Brazil or Mexico, the rules of earmarked matching fund systems can be designed to ensure greater representation.8

The challenge is to develop systems that will actually increase empowerment of the poor. While this challenge is not easily met, there is substantial scope for improving on present
practices by paying increased attention to the vehicle for beneficiary participation and the composition of the various user committees in place in many operations.

Notes

Rural infrastructure investments have traditionally been subjected to the same type of cost-benefit economic analysis as any other infrastructure investment. These analyses are difficult to carry out. When users are charged for RI services, tariffs are almost always subsidized, and thus do not reflect accurately the beneficiaries' willingness to pay for these services. This makes it difficult to use "willingness to pay" as a proxy for economic benefits. When users are not charged, attempts at any direct measurement of benefits is considerably complicated by the fact that benefits are usually not the result of RI alone, but of joint investment in infrastructure and agriculture. Finally, benefits often materialize in an indirect form, through improvements in education, health, or communication, making it even harder to track the impact of rural investments, let alone separate the impact of infrastructure from that of other components of a rural development package. The difficulty of carrying out good economic analysis of rural infrastructure investments has led to many inadequate analyses, which have undermined the credibility of the exercise. For example, a review of rural road projects in Sub-Saharan Africa points to the "lack of reliable agricultural production data, which led to fabrication of data and consequently to overestimation of supply response."

The difficulty of carrying out traditional cost-benefit analysis of RI investments has led to a number of attempts to take a global view of the economic impact of such investments. A variety of regional econometric analyses have been used to measure the global impact of rural development programs, using more or less complicated statistical techniques to dissociate the impact of the various components of these programs. These approaches are summarized very effectively in a synthesis of the literature, carried out by the International Food Policy Research Institute (IFPRI). The IFPRI review brings out the different levels of detail, the corresponding complexity of the analyses, and their limitations. Unless they are carried out with the utmost degree of care, such analyses can be very misleading. In particular, Binswanger has shown the importance of adjusting for agroecological factors which, alone, can account for a far greater share of variations in agricultural productivity than any other variables. A more recent study in Bangladesh by Ahmed and Hossain is designed to neutralize these agroecological factors through a sampling procedure that compares areas with similar resources, and which reflects the current state of the art.

In the long run, complex as they may be, econometric analyses appear to be the only approach to addressing broad RI policy issues, including an evaluation of how much rural infrastructure is enough; how it should be blended with other rural development inputs; and how the various ingredients of rural infrastructure, such as roads, water, power, and irrigation, interact with each other. Short of the
decisive answers that good econometric analysis would provide—and which are unlikely to materialize for a few years—all we can expect from the traditional economic cost-benefit analysis is to throw a minimum of light on the relative ranking of individual RI investments.

Cross-Sectoral Priorities

The most difficult aspect of the prioritization process is the choice between sectors. Traditional cost-benefit analyses are much too crude and based on far too diverse approaches in different sectors to be meaningful for ranking RI investments across sectors. For instance, a village water scheme with an economic rate of return of 4 percent (based on the water tariff paid by the beneficiaries) could have a much higher priority than a feeder road with an 8-percent return based on expected incremental agricultural production. However, surprisingly, cross-sectoral priorities seem to be of very little concern to practitioners, and project audit reports show no indication that this might be a problem. Of the 79 projects reviewed in some depth in the course of preparing this paper, none referred to this issue and only one, the Chiapas Rural Roads Project, mentions the sequencing of investments in roads and other agricultural development activities. The literature on the economics of rural infrastructure does not raise the subject as an issue either, limiting the discussion to the need for “simultaneous availability” of different types of RI. For example, in his 1984 evaluation of the impact of integrated rural development projects, Ruttan writes: “It is important to rural communities that such activities and services become simultaneously available, but not necessarily administratively integrated.”

A Bank review of rural infrastructure in Sub-Saharan Africa also refers to the benefit of simultaneity:

In a comparison of India and Zambia, the accelerated agricultural development in the former was attributed to the government policy of simultaneous pro-

vision of irrigation, electrification, roads and rural service infrastructure (IFRI). Similarly, Wannali and Zamchiya (1992) conclude that in Zimbabwe, the productivity of smallholders, communal farming is significantly influenced by agricultural research and extension, input and output marketing, road transportation, rural service infrastructure, and service center development, as well as government policy.

The extent of the down-playing of cross-sectoral priorities may reflect in part our inability to ascertain these priorities, even if we wanted to do so, but it also seems to reflect a sense that the issue is not of crucial significance. This is important not so much because it obviates a difficult technical problem, but because, from an operational point of view, it opens the door to single-sector lending. So long as each sector is addressing the rural end of its sectoral responsibility, it implies that there is no need to be overly concerned about the integration of investments between sectors.

Heavy Reliance on Beneficiaries' Preferences

Intrasectoral priorities and choices in design standards are more amenable to traditional cost-benefit analysis than cross-sectoral priorities. The secondary benefit of a road is likely to be very similar, whether its surface has six or 12 inches of gravel. As a result the choice between one alternative and the other is likely to be limited to tradeoffs between investment cost, on the one hand, and maintenance and vehicle operating costs, on the other. This is something we know how to quantify reasonably well. In the same vein the secondary benefits of a rural water scheme are likely to be very similar for a village located one kilometer from a water source and one that is two kilometers away. Our traditional tools will give us a reasonable idea of which village should get a new water scheme first, even if they have slightly different numbers of inhabitants. Traditional
cost-benefit analysis can therefore be helpful in establishing investment standards and broad frameworks for government policies at the sectoral level. For example, a central or provincial government may wish to use this type of analysis to decide that, where no surface water source is available, all communities of more than “x” inhabitants should have a well within 500 meters of all houses.

However useful they may be, these analyses will never capture the full extent of the benefits that may result from an investment or the specific circumstances of a particular group of beneficiaries. Whether because of the near-impossibility of using cost-benefit analysis to address cross-sectoral priority issues, or because of their limitation on intrasectoral issues, it seems that traditional cost-benefit analysis is bound to be of limited use in evaluating RI investments. The alternative is heavy reliance on community-based choices, on the grounds that, as has been pointed out by many authors, local communities know very well what they need. The following is just one of countless examples of this point:

Near Bangalore, South India, the village of Pura supplies household electricity and water through large community biogas digesters. . . . Original attempts to promote community biogas systems in Pura failed because they were directed at substituting biogas for wood as a cooking fuel . . . Subsequent discussions with villagers revealed they were more interested in obtaining clean and reliable water supplies located near their houses. Because grid electricity supply was unreliable, the community decided to establish a system of biogas production for fueling a five-horsepower generator. Electricity from the generator was supplied through a microgrid to households and also powered a deep tubewell pump that supplied water to a local system. Each household participating in the program received a tap with clean water at the front of their house, eliminating long walks to the local tank and significantly improving their health. Each household is charged a fixed rate for the water tap and each electricity connection.

Beneficiary participation in rural infrastructure is therefore important, not only for the institutional reasons discussed in chapter four, but also because, in many instances, it will be the only proxy for an economic analysis of investment priorities and design standards.

Community empowerment is, however, not an automatic guarantee of sound economic choices. There is a strong tendency to “idealize” the merit of beneficiary participation as the magic tool that will cure all problems. But there is plentiful evidence of unwise community decisions, in areas as simple and extreme as, for example, gravity-fed water schemes that do not work because they run uphill. While the extreme cases are infrequent and can easily be avoided, there are more frequent instances in which community leaders influence decisions in directions that may be of greater benefit to them personally than to the rest of the community. There are also instances of communities not having the technical know-how to choose between various technical solutions or various suppliers. Equity considerations were already raised in chapter five; they lead to difficult political issues.

If it is to be fully effective, the participation process must be associated with other measures that will increase its chances of leading to well-informed and cost-effective choices. The rest of this chapter discusses some of these complementary measures.

Cost Sharing

As indicated in chapter four, a significant trend toward central governments financing a lower share of RI investments—and beneficiaries financing a higher share—can be discerned over the last three decades. As shown in table 14, in the fiscal 1974–76 period, 63 percent of projects were financed 100 percent by central govern-
Table 14 Number of projects with financial contributions from various sources (percent)

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<tbody>
<tr>
<td>100 percent central government</td>
<td>63</td>
<td>52</td>
<td>45</td>
</tr>
<tr>
<td>Regional/provincial government</td>
<td>15</td>
<td>19</td>
<td>10</td>
</tr>
<tr>
<td>Local/municipal government</td>
<td>4</td>
<td>10</td>
<td>14</td>
</tr>
<tr>
<td>Beneficiaries</td>
<td>11</td>
<td>24</td>
<td>41</td>
</tr>
<tr>
<td>Other</td>
<td>22</td>
<td>19</td>
<td>7</td>
</tr>
</tbody>
</table>

Economic and Financial Issues

In fiscal 1984–86 this percentage dropped to 52 percent, and by fiscal 1994–96 period it stood at 45 percent. The last row in the table largely reflects financing from internally generated funds when the project is implemented by a revenue earning entity. This is the case not only in the energy sector and, in earlier days in the water sector, but in agriculture for some plantation-type projects. The decreasing trend in this source of financing does not seem to have any particular meaning except that the percentage of this type of project has decreased over the years. Similarly, variations in the financial contributions of regional governments do not seem to have any particular meaning, and essentially reflect the number of projects in very large countries such as Brazil, China, India, or Mexico.

It is interesting, and probably telling, to note that the increase in the share of beneficiary financing is not paralleled by a similar increase in the percentage of local and municipal government financing. This probably reflects a lack of trust in the competence of local governments to implement projects and a preference for creating new institutions, rather than attempting to correct the deficiencies of local and municipal governments in rural areas. While this may be a pragmatic way of dealing with RI issues and a good way to generate demonstration projects, in the long run it may not be a satisfactory alternative to dealing with local government weaknesses head-on.

From a practical point of view the link between the economics of RI projects and the source of financing is a function not only of the amount of financing originating from these various sources, but also of the financing mechanism. Binswanger makes a convincing case that a system of matching grants is the best way to go:

A more radical evolution of rural development programs has taken place in Mexico and Colombia and recently on a pilot basis in Brazil, where the programs have evolved into matching grant mechanisms for rural municipalities or districts or for poor beneficiary groups without necessarily losing their multi-sectoral approach. Within these programs genuine decisionmaking power over project funds is delegated to municipalities and/or beneficiary groups, through such mechanisms as municipal funds. Within certain budget limits the municipalities are empowered to choose from a menu of poverty-reducing community projects. Project selection takes place according to rules that increase transparency of decisionmaking to the ultimate beneficiaries and assist in proper targeting to the poorer groups.

The issue is followed up at greater length in the first output of the Decentralization Research Project, which summarizes the choice on intergovernmental fiscal transfers (IGFT) as follows:

In many developing countries non-specific, general grants continue to be the most important type of IGFT. They are often made on an ad hoc basis, entirely at the discretion of central governments, with little effort to develop objective grant design criteria. A few attempts have been made, however, to include specific formulae designed to address issues of horizontal and vertical fiscal imbalances, for example, the Brazil Municipal Participation Fund, which considers municipal population and state per capita income in the determination of fiscal shares for individual munici-
The design of this grant program is an improvement over purely ad hoc arrangements, although problems still remain with the revenue-sharing formula (Shah 1994). Of greater relevance for the specific financing of RD, are conditional grants, both matching and non-matching. . . . Indonesia has a major program of block grants—Inpres—that cover many sectors. . . . Winkler (1994), reviewing grant design and administration for education and health in Chile and rural roads in Colombia, found that modifications to grant design have the potential for realizing considerable economic benefits. The results of his simulations provide some important conclusions: (i) a simple grant design may attain central government objectives as well as a complex design; (ii) price incentives, especially through matching grants, can work just as well as expenditure mandates in increasing available resources; and (iii) central government can best leverage the effect of their transfers on total expenditures by including some measure of the local jurisdiction's fiscal capacity, although this can increase the complexity of grant design.9

Another facet of the cost-sharing issue, in areas where users can be charged for rural infrastructure services, is pricing policy. Only in the 1980s and 1990s did project documents begin to discuss the cost recovery of RI and, as shown in table 15, the trend is not entirely clear. On the one hand, the increase in the number of projects in which pricing is set at long-term marginal cost is encouraging and consistent with the increased contribution to investment cost that is expected from beneficiaries. In addition the long-term marginal cost target is not just in the energy sector, as was the case in the past, but in a wide variety of projects. On the other hand, the increase in the percentage of projects that do not address cost recovery, from 32 percent in the 1980s to 53 percent currently, is disturbing. A high percentage of these projects are in the transport sector and probably reflect an underlying feeling that road-user charges are not a rural issue and are better addressed in trunk roads or network-wide projects. However, many feeder roads are under the jurisdiction of local governments, and the availability of maintenance financing is a major issue. It would therefore seem that a more systematic treatment of cost recovery might be in order, particularly in the case of the transport sector.

Important as cost-sharing issues appear to be, we have relatively little hard evidence of the link between source, amount, and method of financing and the actual economic impact of rural infrastructure investments. Does a 10-percent beneficiary contribution result in twice as great a chance of having selected a good investment as a 5-percent contribution, or does it make relatively little difference? Do contributions by various levels of government enhance the quality of the process, or do they simply add up to unnecessary or counterproductive interference? These and many other questions would benefit from far sharper answers than are available at present, and constitute key targets for research.

**Table 15 Pricing (percent)**

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<tr>
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<tbody>
<tr>
<td>Not discussed</td>
<td>32</td>
<td>53</td>
</tr>
<tr>
<td>Less than O&amp;M</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>About O&amp;M</td>
<td>55</td>
<td>17</td>
</tr>
<tr>
<td>Long-run marginal cost</td>
<td>14</td>
<td>20</td>
</tr>
</tbody>
</table>

**Giving Beneficiaries a Choice**

Although it is often argued that communities should have a strong role in choosing which rural investment projects they want to pursue, RI projects are often concentrated in a single sector. Faced with a "take it or leave it" choice, communities are unlikely to turn down the investment opportunity, particularly in the face of the heavy subsidy component of most RI
projects. This absence of choice thus under- mines the use of beneficiary participation as a proxy for economic analysis. The extreme case is obviously that of single-sector projects, in which local communities do not even have a choice of design standards. But often, even multisectoral projects very substantially restrict the choice of the community. For example the Indonesia Village Infrastructure Project, a recent example of a multisectoral approach, restricts the communities’ choices to roads, water supply, or markets, and, in practice, the choice appeared to be between roads and water. Whether restricting the choice to a couple of sectors is justified and leads to the intended allocative efficiency objective is not clear and should be subjected to scrutiny.

Going one step further, recently completed research on the impact of demand responsiveness in rural water project design indicates that making projects multisectoral is, in fact, not enough to convey to the beneficiaries that they have a choice. Within the same project, beneficiaries can have a radically different perceptions of the extent to which they were involved in the decisionmaking process; and making projects multisectoral does not improve matters much. In one of the four multisector projects included in the review, only a dismal 12 percent of the households surveyed perceived that they had a choice and the highest score for these four projects was only 60 percent. As an interesting contrast, in one of the single-sector projects in which emphasis had been put on technical assistance in community planning, 44 percent of households perceived that they had a choice across sectors whereas, in fact, they did not, since the project was limited to the water sector! Giving a choice to beneficiaries is therefore not just a matter of providing financing for investments in a variety of sectors, but of making sure that beneficiaries actually perceive that they do have a choice.

**Good Information**

Along the same vein, it is often taken for granted that local communities will automatically make the right choices and that, in any event, if they are not in a position to do so, they can call on local consultants or contractors who will help them. But this is wishful thinking. As pointed out by the northeast Brazil decentralization review, reality is more sobering:

Some shortcomings were detected in a number of subprojects, namely the over-design of works due to lack of technical criteria or competent technical assistance or both. . . . Despite the availability of funds under NRDP [Northeast Rural Development Program] to hire professional assistance with planning or implementation, such assistance is hard to obtain in rural areas . . . .

While the importance of information sharing is evident in all successful schemes there has been little, if any, analysis of how best to ensure effective dissemination of information, and of whether it is best handled by governments, NGOs, or through associations of communities. All probably have a role to play, and some thinking should go into the best way to exploit synergies among modes of intervention.

**Financial Replicability**

A surprising feature of rural infrastructure projects, particularly against the backdrop of the increasing policy content of RI operations, is the very low level of attention paid to their financial replicability. As is evident from the record presented above, all RI projects still depend to a very large extent on central government financing; about half relying on such financing for 100 percent of project cost. In addition most rely on subsidies or budget transfers for O&M, and under these circumstances, discussion of whether countries can afford to replicate RI investments financed in specific projects would be expected. Yet, it is very seldom discussed. Of the 30 projects included in this review for fiscal 1994–96, only three addressed the issue, two of which were in Bolivia.
Notes

7. This percentage includes Bank financing as well as financing from other international sources.
APPENDIX 1

Notes on the Database

The data set contains projects with rural infrastructure investments in the following sectors: transport, energy, water supply, sanitation, and irrigation. It excludes:

- All dedicated irrigation projects, covering only those containing an irrigation component among a number of other project components. The large irrigation schemes addressed in dedicated irrigation projects are a very special type of rural infrastructure, often with massive investments in a relatively concentrated area, as opposed to the small and dispersed nature of the investments included in run-of-the-mill rural infrastructure.
- Rural infrastructure projects that have traditionally been considered to be of a “social” nature, such as education and health projects.
- Lending for rural infrastructure through social funds.

Since rural infrastructure is not a separate bank-lending category, identifying projects with rural infrastructure involved searching the text in the databases for any indication that a project might contain a rural infrastructure component. For the period fiscal 1972 to fiscal 1996, this search netted 809 projects, of which 604 had been completed. From this large base, three time periods—fiscal 1974–76, fiscal 1984–86, and fiscal 1994–96—were selected for a more detailed review. There were 226 projects in these three periods.

To carry out an in-depth review, a sample of projects with significant rural infrastructure components was extracted. “Significant” projects are those in which rural infrastructure accounted for more than 20 percent of total project cost. This exercise resulted in 79 projects.

About the Data

The database provides quantitative and qualitative statistics of World Bank operations in rural infrastructure. Quantitative statistics include basic project data: project approval, board presentation, and closing date; total project cost; loan/credit amount; percentage of loan canceled; investment in rural infrastructure; and contribution to capital cost by different levels of government, municipalities, and beneficiaries.

Qualitative statistics include ratings on following issues:

Project Objectives

Lending. Did the project state why the rural infrastructure component was important or what objectives were being pursued in financing it or did it implicitly assume that the component was necessary if the project was to meet its other objectives?
Financial. Is there a convincing discussion of pricing issues and cost recovery arrangement? Also, any mention of the extent to which financial resources are, or will be, available to replicate the project on a national scale?

Decentralization. Description of decentralization mechanism, role of different levels of government, private sector, and users associations, and the way in which it affects project implementation.

Poverty alleviation. An explicit criterion in the selection of specific subprojects, was it addressed in the pricing of rural infrastructure services or addressed through the creation of employment?

Technical. Discussion of appropriate design standards, labor-intensive construction, other technological innovations, for example contracting methods or promotion of small-scale contractors.

Project Implementation Unit

Is the project implemented by a unit created specifically for the purpose of the project or by a preexisting unit with special responsibility for implementation of the type of component financed under the project? Does the project implementation unit play a coordinating role among agencies involved in the project or an implementation role (within or from outside the line agencies)?

Participation

To what extent are beneficiaries participating in project implementation; that is, through minimal consultation or an extensive and formal consultation process? Do beneficiaries have enough power to decide on their level of involvement, such as decisions on design standards, cost sharing, pricing, or procurement?

Investment Targeting Mechanism

Are the subprojects selected on the basis of:

- Economic criteria
- Poverty criteria
- A combination of economic and poverty criteria
- Government choice, without explicit social or economic criteria
- Beneficiaries' choice, without explicit social or economic criteria?

Achievements

There are two sets of ratings for achievement. One is based on OED records and the other on the author's evaluation of the achievements of rural infrastructure components of the project. The indicators used for reviewing project achievement were:

Physical achievement. Whether the project managed to get the infrastructure built and how well it did so.

Institutional development impact. How effective was the project in establishing an institution or improving the organizational and financial efficiency of an existing institution to provide rural infrastructure?

Sustainability. Extent to which project can be expected to generate adequate revenues or receive adequate budgetary funding or beneficiary initiative to ensure that new infrastructure or services provided stood a reasonable chance of lasting.

Outcome. Relevance of the operation in terms of country and sector developmental priorities, extent to which physical and other objectives were met, and economic or financial rate of return.
APPENDIX 2

Rural Infrastructure in World Bank Lending

Figure A2.1 World Bank lending, by number of projects, 1970–96

Figure A2.2 World Bank lending, by commitments, 1970–96
Figure A2.3 Number of Bank operations with rural infrastructure, 1970-96

Note: "Negligible" indicates that investment costs for rural infrastructure are less than 5 percent of project cost; "small" indicates that they are between 5 and 20 percent.