WHEN DO RURAL ROADS BENEFIT THE POOR AND HOW?

An In-depth Analysis Based on Case Studies

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Participatory poverty assessments have long identified remoteness and isolation as critical components of poverty. Although it is widely assumed that investments in rural roads reduce poverty, there is little evidence of the ways in which these impacts occur or what their determinants are. Through the collection of empirical evidence from a cluster of case studies drawn from past Asian Development Bank operations, the study addressed this void. The objective of the study was to be an input for the improvement of the design of rural road components to achieve sustainable benefits for the poor. The study focused narrowly and deeply on selected case study villages within a project area, enabling an understanding of the factors that influence impacts on poverty. The study analyzed poverty as a multi-dimensional concept, adopting an assets-based approach wherein poverty is defined as a deprivation in assets and entitlements essential to life, and a susceptibility to periodic physical and economic shocks and to seasonal crises.

In all case study projects, the poor and very poor benefited substantially from rural roads through access to state services in areas such as health, education, agricultural extension, and provision of information. Improved rural roads created the conditions for better access of people to services, and of services to the villages. Such improvements reduce the perception of isolation and remoteness among the poor and very poor.

The study showed that the context within which economic impacts take place is often determined by conditions such as climate, agricultural potential, spatial position and proximity to networks, and world market commodity prices, as well as by social structure and concentration of assets. Although these conditions cannot be affected by road development, their careful consideration during project identification and design would enable better assessment of the potential for poverty reduction through such projects, while possible complementary measures could be considered to increase positive impacts.

In the case study areas, economic benefits achieved were clearly different for different socio-economic groups. Most of the journeys made by the rural poor are for subsistence tasks. For them, access to local facilities and the primary transport network is critical during times of need, especially for health and social reasons. Improvements to the primary village network of paths, tracks, culverts, and access routes that reduce the burden of basic household and productive tasks, as well as the increased availability of intermediate modes of transport with larger carrying capacity to collect water, firewood, etc., are likely to have a greater initial impact on the well-being of the poor than improved availability of motorized transport services, which they do not or cannot afford to use. Therefore, improving transport within a village is as important to the poor and very poor as providing access to markets outside the village.

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Roads are clearly a critical enabling condition for improving living conditions in rural areas. However, the distribution of socioeconomic benefits resulting from a rural road is a separate issue, and there are no guarantees or inherent mechanisms to ensure that these benefits will be distributed equitably between the poor and the nonpoor in communities. In the rural road projects studied, their ability to affect the distribution of assets and the skills capacity of the poor was limited and largely outside their scope. Nevertheless, recognizing how assets are distributed is important both for understanding how benefits will accrue and for planning complementary measures to enable those who lack assets also to benefit from the investment. Given the right complementary activities, projects can broaden livelihood opportunities. The poor need support to make use of the opportunities that rural roads may bring. This suggests that integrated projects are needed to tackle poverty effectively.

The case studies covered both sector road investments and integrated projects, where the road was one part of a larger program. In practice, the latter were either not truly integrated or were focused largely on benefiting better-off farmer groups. The poor require genuinely integrated programs of support right through the cycles of production, transportation, and sale. For the poor to travel for productive purposes, the provision of transport services must be linked to some livelihood and income diversification activity that builds on or supplements their existing subsistence activities. For such a scheme to be sustainable, it must eventually be self-financing. Implementation of integrated rural road projects is difficult, and the contextual situation differs from place to place. The Asian Development Bank (ADB) may suggest to borrowers to take on partners in program design and implementation (working with partners and project performance monitoring). The importance of baseline surveys and data monitoring needs to be realized by all stakeholders if rigorous impact evaluations are to be carried out in the future to further improve project design. The study also acknowledges that governments have a critical role in facilitating a regulatory environment for competitive transport services, in participatory selection of roads to be improved, and in promoting understanding of the priority to be given to poverty reduction by its agencies.

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# CONTENTS

ABBREVIATIONS AND ACRONYMS vi  
GLOSSARY vi  

INTRODUCTION 1  
Background 1  
Study Objectives and Scope 2  
Methodology 2  

CONSIDERATIONS FOR PROJECT DESIGN AND IMPLEMENTATION 5  
Considerations for Project Design 5  
Considerations for Project Implementation 9  

KEY IMPACTS AND RELATED ISSUES 12  
Changes in Transportation Services 12  
Changes in Travel Patterns 17  
Changes in Village Profile 19  
Changes in Income and Welfare 25  

CONCLUSIONS AND RECOMMENDATIONS 32  
Study Conclusions 32  
Recommendations for Strengthening Poverty Reduction Impacts 34  

BIBLIOGRAPHY 37  

APPENDIXES (found on CD-ROM)  
1. Methodology  
2. Case Study Projects and Sites  
3. Poverty Details  
4. Sample Framework for Documenting Field Research  
5. Case Study Details in Sri Lanka  
6. Case Study Details in Indonesia  
7. Case Study Details in the Philippines
ABBREVIATIONS AND ACRONYMS

ADB  Asian Development Bank
DFID  Department for International Development, United Kingdom
FRIP  Fifth Road Improvement Project
ha  hectare
INO  Indonesia
kg  kilogram
km  kilometer
NGO  nongovernment organization
NWP-WRDP  North Western Province - Water Resources Development Project
PHI  Philippines
PRA  participatory rural assessment
SIADP  Sorsogon Integrated Area Development Project
SPRIP  Southern Provincial Roads Improvement Project
SRI  Sri Lanka
TCSSP  Tree Crop Smallholder Sector Project
TLRP  Third Local Roads Project
VOC  vehicle operating cost

GLOSSARY

banca  nonmotorized boat (Philippines)
barangay  smallest administrative unit (Philippines)
cadjan  woven coconut leaves (Sri Lanka)
carabao  water buffalo (Philippines)
china  dry land (Sri Lanka)
hacienda  large estate or plantation (Philippines)
jeepney  locally made minibus-like vehicle (Philippines)
sari-sari store  convenience store (Philippines)
sitio  part of a barangay (Philippines)
tokeh  intermediary (Indonesia)

NOTE
In this report, “$” refers to US dollars.
Background

Designs of transport projects financed by the Asian Development Bank (ADB) have often tried to capture the direct and quantifiable costs and benefits associated with rural road investments. Following adoption of its poverty reduction strategy, ADB has carried out much research and analysis into the poverty dimensions of its operations; poverty reduction has become a much more explicit imperative. It is now increasingly recognized, however, that indirect impacts from road investments may have either a positive or negative effect on poverty. To date, it has been difficult to capture empirical evidence of these indirect effects in a systematic way. Although it is widely assumed that investment in rural roads reduces poverty, there has been little systematic analysis or evidence of the ways in which rural roads actually affect the poor. This study attempted to address that lacuna through the collection of empirical evidence from a cluster of case studies drawn from past ADB operations. It was intended primarily to address two questions:

- How do rural roads help reduce poverty?
- How can rural road projects be designed to help reduce poverty more?

Focus

The study was initiated in response to requests from ADB staff to examine the impact of rural road investments on poverty. It was developed as a retrospective study, assessing the impacts of past road investments. It did not have the luxury of identifying, monitoring, and comparing impacts before, during, and after the investments. However, it had the advantages of in-depth fieldwork in a variety of villages and of systematic analysis of both quantitative and qualitative data collected and verified through an array of tools. It focused particularly on transport-poverty linkages in rural road investments, rather than on the distribution of impacts across various segments of society. The lessons learned and discussed here should increase understanding and strengthen the effectiveness of efforts toward poverty reduction in future operations of ADB and other development institutions, especially investments concerned with rural roads and transportation.

Structure

The case studies selected were sufficiently varied and the methodology adopted was effective to give a range of useful lessons. This study was structured to help designers and implementers of future road development projects to grasp the key issues that are relevant at the different stages in the project.
cycle and to understand the extent to which outcomes and impacts may be affected by contextual factors. Chapter I presents the background for the study and summarizes its methodological approach. More details on the methodology are given in Appendix 1. Appendix 2 describes the projects and case study contextual scenarios. Appendix 3 presents the study’s approach to defining poverty and factors that influence poverty in the case study areas. Appendixes 2 and 3 discuss real-life considerations that may shape the assumptions that have traditionally been made about the impact of rural roads on poverty reduction. Chapter II, based on the study findings, indicates what is important to consider when designing and implementing rural road projects. Chapter III discusses those key impacts that may occur immediately following a road improvement project and those that may take more time. Issues that emerge from these impacts then lead to the conclusions and recommendations in chapter IV. Additional details on country case studies are presented in other appendixes. All appendixes are found on the CD at the back.

Study Objectives and Scope

The study was limited in its objectives. It focused only on rural roads and on how they relate to poverty reduction. Urban roads and road networks were taken as a given and not considered in the study. The study’s overall objective was to learn how to better design the rural road components of projects in the future to achieve sustainable benefits for the poor. Within this overall objective, the following questions guided the study’s direction:

- What are the different kinds of impacts that rural roads have on poverty?
- How can we effectively capture the factors that lead to these impacts?
- What types of complementary services and considerations are essential to accelerate the beneficial impacts of rural roads on the poor?

The study used past ADB road improvement project components1 to illustrate and capture the impacts of rural roads on poverty. Most of these projects were approved before ADB adopted its poverty reduction strategy and were not designed specifically with poverty reduction as their main objective. The study, therefore, did not attempt to evaluate these ADB project investments. Instead, it consciously adopted a forward-looking, lesson-learning approach. Realizing that lessons and pragmatic recommendations need to capture the real-life impediments that often vex project design assumptions, the study team chose to focus narrowly and deeply on selected case study villages within each project area. This enabled the study to capture both direct and indirect impacts, allowed it to focus on the role of road transport services and accessibility within the broader socioeconomic-cultural context of a village, and permitted it to understand the process and factors that influence impacts of rural roads on poverty. A wider coverage of the project area would have prevented the study from grasping the factors that underlie the impacts. To design better projects, the opportunity to understand the underlying factors and thereby to learn how to influence poverty reduction was considered more useful than providing irrefutable statistical evidence that roads may have many beneficial impacts on the poor. This deeper understanding will enable ADB and its developing member countries, as well as other external assistance agencies, to design interventions that maximize beneficial impacts.

Methodology

Assumptions and Tools

The study methodology was carefully designed to maximize the use of both qualitative and quantitative information available for a retrospective impact evaluation of this nature. The study was based on several methodological assumptions that broadened its sphere of inquiry.2 It did not assume an

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1 The projects considered in the study were components of either broader transport sector projects or integrated rural development projects.

2 Appendix 1 describes in detail the evaluation approach used, methodological assumptions, and project selection criteria.
automatic link between rural roads and poverty reduction, but considered the multifaceted impacts that determine how people respond to improved rural roads and that shape livelihood constraints and opportunities. It questioned whether rural roads would automatically lead to better rural transport services, especially for the poor. It accepted that poverty is a multidimensional condition, with lack of income as only one component. It focused on both physical and nonphysical accessibility constraints that the poor may have, and reviewed both direct impacts, which are often felt immediately, and indirect impacts, which take time to be felt. It recognized that women and men have different productive and household responsibilities and, therefore, different transport needs. To capture this broad sphere of influences, it focused on key impact indicators using available secondary statistics, and relied on classical road impact assessment tools such as traffic and passenger surveys and changes in vehicle operating costs (VOCs). In addition, it collected data from household surveys, key informant interviews, participatory rural assessments (PRAs), and feedback workshops. These tools were used sequentially, each intending to inform the next phase and cumulatively to validate the data. The qualitative data were fed into a framework that captured not only the outcomes of the project intervention but also the factors that affected the impacts. The use of different tools ensured effective cross-checking and validation through the triangulation of findings for study robustness.

Case Study Selection
Based on discussions with ADB staff working on roads and rural development, suitable projects were identified in selected countries. Three countries, with two projects in each, were selected after consideration of a variety of conditions in the Asian region such as coverage of other ongoing studies; type of ADB projects that finance rural roads; and practical limitations set by resources, security concerns, and time. The countries selected were Indonesia, Philippines, and Sri Lanka. Cumulatively, the cluster of field sites selected from these projects covered a broad range of both physical and nonphysical factors likely to condition the context for rural road interventions across ADB operations. One of the projects chosen in each country was a sector-based road investment, and the other an integrated rural development project with a rural roads component (Table 1). In selecting these different kinds of projects, the intention was to compare the impact of a road investment on its own or as part of a wider program. From each project, a road segment was selected as a case study area. Road segments in poor districts (where the incidence of poverty was high) were purposely selected.

### Table 1: Study Sites

<table>
<thead>
<tr>
<th>Country</th>
<th>Project</th>
<th>Project Site</th>
<th>Control Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>Tree Crop Smallholder Sector Project</td>
<td>Talang Kabu, Bengkulu</td>
<td>Padang</td>
</tr>
<tr>
<td></td>
<td>Third Local Roads Project</td>
<td>Candirejo Village, Yogyakarta</td>
<td>Sumber</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Wungu-Kelayu</td>
</tr>
<tr>
<td>Philippines</td>
<td>Sorsogon Integrated Area Development Project</td>
<td>Palale, Sorsogon</td>
<td>Bical</td>
</tr>
<tr>
<td></td>
<td>Fifth Road Improvement Project</td>
<td>Magallon Cadre, Negros Occidental</td>
<td>Macagahay</td>
</tr>
<tr>
<td>Sri Lanka</td>
<td>North Western Province Water Resources Development Project</td>
<td>Nuggnoruwa, Kurunegala</td>
<td>Walahinikailia and Wembuwa</td>
</tr>
<tr>
<td></td>
<td>Southern Provincial Roads Improvement Project</td>
<td>Heegoda, Matara</td>
<td>Makilyathanne</td>
</tr>
</tbody>
</table>

3 A sample framework for documenting field research is given in Appendix 4.
4 Triangulation of findings in this study refers to the validation of study results through three key methods: (i) household and traffic surveys, (ii) PRAs and key informant interviews, and (iii) key impact indicators.
5 Since different countries use different definitions for rural roads, the study selected basic roads funded by ADB in predominantly rural areas.
selected during this process, as the study focus was the impact of roads on poverty reduction.6

**Attribution**

The most difficult part of any impact evaluation is attribution of impacts to a particular intervention. This is because the impacts (i.e., on poverty) may come not only from rural roads but also from other types of development activities in a particular area or community. To attempt to attribute particular impacts to rural roads, adequate control mechanisms are needed. Since the projects under consideration had already experienced the rural road intervention, it was not possible to use an experimental design, where control groups are established randomly. Instead, the initial intention of the study was to use a quasi-experimental design, which utilizes control groups that resemble the intervention groups. Then, the double difference technique7 could be used to attribute the impacts of the intervention (in this case a rural road).

The two crucial ingredients needed for the double difference technique are the selection of suitable control sites and good baseline information. Control sites were to be similar to the study locations in every way, except that they did not have a road. To avoid inherent selection bias of control sites, every attempt was made to find areas that had the same agricultural potential as that of a project site. Collection of baseline data on the preproject situation proved to be difficult, however, and data collected were inadequate. Instead, recall techniques were used to compare before and after conditions in a qualitative sense. Even the recall techniques proved to be quite difficult to use in some case study areas. The road appeared not to be one of the most important determinants in the villagers’ routines and, therefore, road-related information could not be easily recalled. In the end, given the absence of useful baseline information or detailed recalled information, it was difficult to use even a modified double difference technique precisely, thus making rigorous attribution of impacts impossible. Instead, the control sites were used to understand and compare the difficulties that the poor face without accessibility, and the extent to which easing this constraint would improve their status. This enabled comparisons of “with” and “without” project situations to a certain extent.

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6 Therefore, the findings from these case study locations may not necessarily be applicable across the entire area covered by each of the projects considered. The study team discussed this at a methodology workshop, and it was advised by the workshop participants that, since the study focus was to understand how rural roads projects can best contribute to reducing poverty and not to evaluate the projects, using relatively poor locations as case study sites was in line with the study objectives. Appendix 3 analyzes the concept of poverty in the case study locations.

7 The double difference technique uses the differences in impacts before and after an intervention and also between a project site and a control site (with and without project) to attribute impacts of the intervention.
Considerations for Project Design

The impacts of rural road investments do not occur in a vacuum. Geographic, climatic, social, and economic conditions determine the context within which impacts take place. This chapter discusses various conditions that are conducive or not conducive to poverty reduction through rural road improvement. A careful consideration of these conditions can yield a checklist for use during project identification and design to assess the potential for poverty reduction through road development projects. The conditions that are not conducive can be categorized into two groups: external conditions and structural conditions. The influences of these two types of conditions on the case study areas are described using site-specific examples. Although the conditions described here are not applicable to all sites, by using these specific examples the study tried to illustrate the key factors that determine the type and magnitude of impacts that improved rural roads may bring to the poor. Awareness of these factors and periodic monitoring of a sample of project areas may enable the provision of other supporting measures or complementary efforts to increase the beneficial impacts on the poor.

EXTERNAL CONDITIONS NOT AFFECTED BY ROAD DEVELOPMENT

Climate and Natural Resources
All of the roads covered in the study serve agricultural communities, and the local people rely overwhelmingly on agriculture for their livelihoods. The potential to make use of the road to improve livelihoods is, therefore, heavily reliant on the fertility of the land and the potential for greater production and diversification of agriculture. A number of factors are important here, including access to land (discussed subsequently) and the availability of extension services. But core necessities are a climate and a natural resource base with the potential to support increased and intensified agricultural activity.

The Kurunegala project site in Sri Lanka shows how villagers’ ability to make use of a better road is conditioned by wider climatic conditions such as the 3-year drought that crippled the village’s rice production (see Appendix 5). This affected both landowners and the wage laborers who worked in the fields. In another project site in Yogyakarta, Indonesia, the project road passes through an area where water retention is difficult, the soil is rocky, and it is time consuming to prepare fields for cultivation. Therefore, crop diversification into higher value cash crops is difficult (see Appendix 6). Consequently, despite the incentives provided by better roads, these climatic and natural resource conditions limited the ability of some areas to respond.

Remoteness and Access to Marketing Networks
Locational factors have an important bearing on the potential for development. A comparison of project sites indicates that there is a close correlation between the intensity and severity of poverty and the distance from major population centers and marketing networks. In more remote locations (Sorsogon, Philippines—see Appendix 7), it is more difficult to attain a critical mass of demand and availability of transport services. In those locations closer to major towns or centers (Matara, Sri Lanka—see Appendix 5), distances are shorter and, therefore, the intensity of communications and of information exchange is much greater. Rural inhabitants here are more likely to engage in alternatives to subsistence agriculture, at least...
seasonally, and to be able to achieve better prices for the goods that they sell, where competition and demand are higher. More remote areas, therefore, simply have a greater isolation barrier to overcome before the anticipated economic benefits of improved rural roads can make themselves felt.

**Macroeconomic Context and Terms of Trade**

Many of the study locations were heavily reliant on a single cash crop. In Sorsogon, it was copra; in Negros, sugarcane; in Matara, tea; and in Bengkulu, rubber. Fluctuations in the world market prices of these commodities had an enormous impact on the well-being of all socioeconomic groups in the study communities, as all groups were tied into the commodity economy through sale or labor. Where crop prices were good or increasing, significant benefits accrued from road improvement and resulting marketing opportunities (tea in Matara—see Appendix 5). But a slump in world market prices can create a significant downturn in a village economy (copra in Sorsogon—see Appendix 7). Then, the poor and very poor, being risk averse, are more likely to concentrate on subsistence food production rather than cash crops (rubber in Bengkulu, Indonesia—see Appendix 6). The susceptibility of poorer farmer groups to debt also means that they are forced to sell their crop immediately after the harvest, when prices are lowest; they cannot wait for prices to increase in the world market.

The world market drives many commodity prices. Persistent difficulties experienced by the study communities producing cash crops in Indonesia and the Philippines appear to support the contention that developing countries are increasingly subject to fluctuating terms of trade in agricultural products. This leads to what has been described as a process of “de-agrarianization,” a fundamental change in the nature of rural economies in the face of a slump in the terms of trade, with non-agrarian, nonfarm employment becoming increasingly important in sustaining rural livelihoods. Some of these issues are revisited in the following sections with a detailed discussion of the evidence from the case studies of increased outmigration and employment. Mobility, particularly for the young, appears to be increasingly important in this context.

**STRUCTURAL CONDITIONS NOT AFFECTED BY ROAD DEVELOPMENT**

The prevailing social structure and concentration of productive assets had an enormous bearing on determining how impacts occurred in each of the study locations. The concentration and distribution of land were particularly important, and largely outside the area of influence of any road project. Box 1 describes a very poor family situation in Sorsogon, Philippines that experienced no difference in income after the road project, because they had nothing to sell. Therefore, recognizing how assets are distributed is important in understanding how benefits will accrue, and for planning, mitigation, and complementary measures to enable those who lack assets to also benefit from any planned investment.

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*Due to indebtedness, farmers are compelled to sell their produce to their creditors at low prices.*

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In the Sorsogon case study area, land ownership was heavily concentrated among a small number of owners (Appendix 7). Many were absentee owners residing outside the village, with longstanding relationships with tenants who farmed the land. Often, tenants were required to sell the crop (copra) to the landlord at a predetermined price. In exchange, they received credit facilities throughout the year against the next crop. Similarly in Bengkulu, intermediaries (tokeh) and

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9 The study roads were mainly existing roads that were improved; therefore, no land acquisition or resettlement was involved.
Mr. and Mrs. A live on a small piece of land beside the project road in Barangay Palale, Sorsogon. They do not own the land and have been squatting there for the past 12 years. Their house is a basic bamboo-walled, mud-floored structure, with a grass thatch roof that leaks during the rains. They have eight children (5 months–12 years). Because of income constraints, all were home births. The eldest attends the high school in the neighboring barangay; the other school-aged children attend the local barangay elementary school.

Education is a major expense for the household at PHP250 a year for the eldest and PHP50 each for the other four. The parents recognize the importance of educating their children, and their major aspiration is that all finish at least high school.

Mr. A works as a laborer in the community, processing coconut to copra. He works for two tenant farmers, but the work is not regular—4 days a month on average. He is paid between PHP100 and PHP150 (US$1.95–$2.93) per day. The family grows some gabi (a root crop with edible leaves) and yams on a small piece of unused land (0.25 hectare) some distance from the house and must buy everything else they need. They sell gabi if there is a surplus, and Mr. A does other laboring jobs when there is an opportunity. Mrs. A does not work outside the household. They keep some small animals, their major source of income, to cope with crises. They currently have one hen, five chicks, and one pig. Mr. A recently sold his rooster for PHP80 to have his child treated at the clinic in San Francisco, Sorsogon. The health of the children is their major concern. They hope that they do not become seriously ill, as they cannot pay for treatment. They also fear the occurrence of another typhoon such as the one that damaged their house 2 years ago. They have open credit with a storekeeper in the village and pay no interest as long as the bill is paid within a reasonable time. Prices for goods in the village are, however, more expensive than in the Bulan market center. Mr. A travels to Bulan only when he has some money for groceries. He had money over the past week, so he bought rice, coffee, sugar, and milk for the baby. Mrs. A travels about once a month to Bulan, but usually only if there is some need such as provisions or something for the children.

Mr. and Mrs. A recognize that more transport is available along the road now since it was rehabilitated, but it has not become any cheaper to use. They are, in any case, able to use these services only intermittently, when they have money for purchasing essential items.

In these overwhelmingly rural, agricultural project settings, land ownership is clearly a key parameter in determining if, and how, people can take advantage of opportunities that a road may bring.

**CONDITIONS THAT CAN BE AFFECTED BY ROAD DEVELOPMENT**

The improvement of rural roads is broadly recognized as a fundamental precondition for the development of rural areas, and remoteness and lack of mobility are widely identified by the poor themselves as factors in heightening vulnerability and perpetuating their poverty. Investment in transport can create economic opportunities for the poor directly through employment in infrastructure construction and maintenance, and the provision of rural transport services, and indirectly through improving the conditions and opportunities for marketing goods and services (see, for example,
Box 2, reducing input prices, opening opportunities in new markets, and offering seasonal migration opportunities for work; it can also improve opportunities for household travel for social purposes, such as visiting family or accessing health facilities.

Access to health facilities and personnel and other basic needs is critical for all. A rural road provides the opportunity for the poor and very poor to access these services based on their needs and gives government an opportunity to reach the poor (see Box 3). Although it may not be reflected in an income sense, this impact reduces the vulnerability of the poor and can be reflected as a means of multidimensional poverty reduction. Beyond this, basic transport needs may be different for different socioeconomic groups. The poor lack time and energy. Impacts that either reduce or exacerbate this time and energy deficiency have a critical bearing on poverty. Better-off groups that have time, energy, and capital may have better opportunities to expand their livelihood activities and welfare.

Mrs. B is a 50-year-old widow, living with her two daughters (22 and 27 years old) and one son (13). They are a very poor family with dilapidated and unhealthy housing conditions: 4 meters x 6 meters, tile roof, wood walls, and earthen floor. Mrs. B works as a farm laborer, supplementing her income by collecting firewood. The oldest daughter works as a household helper in Yogyakarta, the capital of the province. The family has 0.2 hectare of land, which is planted to cassava and groundnut. The land is on a slope and not very productive. Mrs. B cannot do heavy jobs, only planting, weeding, and harvesting. Job opportunities are not always available through the year. Generally, she works 2–3 days per week for 8 hours per day. She gets Rp2,500 (US$0.26) for 4 hours work from 7 a.m. to 11 a.m. or from 1 p.m. to 5 p.m. To avoid the cost of lunch, the farmers do not recruit her for a full day. From this job, she gets an income averaging Rp40,000–Rp60,000 (US$4.08–$6.12) per month.

Mrs. B’s normal expenses are Rp3,500 per day for her family’s basic needs such as rice and vegetables, so that she needs Rp105,000 per month. Additional income, chiefly from selling firewood, which she collects from her farm or the nearest uncultivated land, amounts to Rp10,000–Rp50,000 (US$1.02–$5.10) per month. Generally, their income is insufficient to satisfy the family’s needs. To meet the food shortage, Mrs. B borrows money from a neighboring farmer and pays it back by working on that person’s farm, or she borrows from intermediaries at an interest rate of 20% per month. She gets additional income from her oldest daughter. She remembers that she was not involved when the road was being rehabilitated, because the project did not want to use women, although she was ready to work on the road or any other construction.

Although job opportunities are not always available, Mrs. B is not interested in looking for a job outside the village. She works inside the village, so she does not need transportation for work. She needs transportation only when she goes to the market weekly to buy provisions for her family. She realizes that it is easier for her to go to the market after the road was rehabilitated, because public transportation is now readily available. Before the road was rehabilitated, the round trip fare to the market was Rp4,000. Now, it is just Rp1,000. The other benefit from the good road is that it is now easier for her to sell the firewood, because many intermediaries come from outside the village to buy it at a higher price than before the road was rehabilitated.

Mrs. B understands that it is a better situation now after the road was rehabilitated, but it does not provide many benefits for her job, as she works inside the village. She benefits from the good road only when she goes to the market, where firewood has become more expensive due to higher demand. She does not have any new ideas about how to use the road to make her life better.
Women and men may have different transport needs, and an analysis of intrahousehold dynamics is also important in evaluating the impact of rural road investments. Women are more likely to lack access to means of transport, or income for travel, but have a heavy transport burden in meeting household, productive, social, and community obligations. They may also face significant non-physical (social) barriers to using some types of transport (i.e., bicycle) or to traveling alone outside the household or community.

During the project design, these different socioeconomic groups and possible outcomes, as well as gender aspects, need to be recognized, with particular focus on how they will affect the poor. The possible outcomes can be broadly classified according to direct impacts, which can be expected to occur soon after road improvements, and other impacts, which may take considerable time. How these outcomes were different or similar in the various project sites and control sites, as well as among different socioeconomic groups, is discussed in chapter III; therefore, only the outcomes are listed here:

- **changes in transportation services**: transport modes, volume, cost, and competition
- **changes in travel patterns**: number of trips, purposes, and distances
- **changes in village profile**: agriculture commercialization; social services like health, education, information, credit, and extension; and migration and remittances
- **changes in income and welfare**: food security, household income sources, and welfare

### Considerations for Project Implementation

This section discusses implementation issues relevant for road development and how they relate to poverty reduction. The issues range from labor-based construction and maintenance options to responsibilities for road sustainability and community participation.
LABOR-BASED TECHNIQUES AND POVERTY REDUCTION OPTION

One aspect of rural road development that benefits the poor directly is the opportunity that roads offer for employment in construction when labor-based methods are used. Of the six projects evaluated under this study, only one (Bengkulu) had some limited form of labor-based road improvement component. Consequently, the level of employment of local people on the projects was very low. Where limited opportunities did arise, it was seldom the poorest who were explicitly selected for the work. Women were often excluded, even though female single-headed households were among the most vulnerable in all of the study locations. Of the 2,271 people covered by the survey, 97% were not employed on the road in any way, and 2% were engaged for only about a month each. Most of those who were employed were from the Bengkulu and Yogyakarta project sites. Twice as many men as women were employed, and women reported that, even when the opportunity to work on the road did exist, they were often excluded in favor of men. About 8% of all household respondents knew of work opportunities on the road, and of these, about one third were refused a job by implementation staff. Of those employed, the majority were casual laborers during rehabilitation work. Because of the short nature of the work opportunity, the wages were used primarily to meet household food deficits (70% of responses). Others paid off debts or bought household items.

Experience from Asia and Africa over the past 40 years shows that a principal means for the poor to gain direct benefit from rural road programs is through paid employment in carrying out physical works. Although employment on road reconstruction is temporary, the short-term injection of cash can often provide the necessary start-up capital for the poor to diversify livelihoods. Labor-based maintenance also offers an opportunity for the poor to earn money on a regular basis through the road. In developing Asian countries, where under-employment is a major problem in rural areas and the state suffers from a lack of financial capital, it may be more cost effective to use labor-intensive construction methods. Authorities in the study countries, when questioned on this point, avowed that labor-based construction methods are slow and that the quality of work can be variable. But for low-volume rural roads, the time and efficiency argument in construction or rehabilitation is surely not so important, as the opportunity cost of disruption to traffic is very low. Arguments about the poor quality of labor-based works are refuted by experience from elsewhere in Asia, particularly Cambodia and the People’s Republic of China, which have traditions of labor-based works and where studies have shown that the quality of work can be at least as good as that of contractors using machinery. A strategy using paid labor for most tasks, and machinery for compacting, might be a suitable compromise for gravel road reconstruction in rural locations. It may be useful to increase the awareness of success of labor-based road construction and maintenance through workshops or study tours.

GOVERNANCE ISSUES SURROUNDING RURAL ROADS

Roads as Political Capital

Roads played a critical role as political capital in all of the study locations. Decisions about where roads should be built, which roads should be upgraded, and which roads should be maintained were heavily influenced by the prevailing political context. This was not a recent phenomenon, as the example of the Negros study location shows. Negros has always been a key sugar-producing area of the Philippines, and many of the decisions regarding its development have been made with sugar production, the plantation owners’ interests, and the interests of the industry in mind. In the Matara and Bengkulu study areas, the villagers lobbied authorities and politicians for the inclusion of their roads in rehabilitation schemes. The ability to do this successfully appeared to depend heavily on the level of political influence communities could exert. As a result, decisions about road rehabilitation, maintenance, and the prioritization of work were often far from transparent. Poorer areas are likely to suffer under this regime, as they are least likely to have the connections and authority to lobby effectively for better roads.

Neglect of Maintenance

Regular maintenance of rural roads is a critical precondition for sustaining the positive impacts that roads bring to rural communities. Minor maintenance is often neglected because of lack of funds, but it is also neglected because there is little political capital or mileage in maintaining roads regularly, as the results of minor maintenance are not highly visible. Instead, politicians prefer to autho-
rize major rehabilitation or reconstruction to take place after the road has deteriorated very much. The promise of improved roads from politicians is often sufficient to ensure their election, and, if works do take place, politicians are quick to claim credit. This practice prevailed in all of the study countries to a greater or lesser extent. And in this context, establishing regular and transparent maintenance regimes and criteria for rehabilitation is very difficult. Roads consequently get reconstructed, are left to deteriorate, and then are reconstructed again in 10-or-so-year cycles, so that villagers experience peaks and troughs of accessibility, rather than having a constant and guaranteed level of access.

Institutional Responsibility for Roads

Problems of maintenance, which stem from scarcity of funds, are exacerbated when the institutional responsibility for rural roads is not clear or where the budget source for maintenance has not been properly established. Often, there appeared to be a lack of clarity (in practice, if not in theory) concerning who was responsible for maintaining the project roads and where the funds would come from. This was particularly the case with the integrated projects, which rehabilitated gravel roads. The asphalt roads rehabilitated under transport sector projects were usually the responsibility of the public works department or department of roads/highways. With the integrated projects, roads were often only a subcomponent of the works, and the executing agency for the project was the agriculture or irrigation department, with no direct funding line for road maintenance. Also, problems of unclear institutional responsibility are compounded when there are frequent shifts in personnel at responsible implementing agencies due to the high level of politicization of the bureaucracy. Institutional continuity and ownership of the roads suffer as a consequence, and roads fall into disrepair.

COMMUNITY PARTICIPATION AS A KEY TO LONG-TERM SUSTAINABILITY

Full community participation and management are increasingly recognized as important for the long-term sustainability of infrastructure investments. However, when community management means cash or labor contributions, the burden can fall disproportionately on the poor. They may be forced to contribute free labor, which leaves them less time to engage in their primary productive tasks, and their subsistence needs and food security suffer as a result. They may also be forced to contribute toward the provision or maintenance of infrastructure that they hardly use or are unable to utilize. Community involvement should, therefore, mean more than labor contributions from the poor. They should be involved in the assessment of needs and decisions regarding maintenance and management. This will ensure that community participation is genuinely pro-poor and inclusive, and will contribute to the long-term sustainability of investments, as the poor, too, will have a stake in using and maintaining appropriate roads that serve their needs.

Villagers throughout the control areas in the study recognized the importance of roads in bringing benefits to their communities. In the Yogyakarta control site, the villagers had maintained and managed resources for their own intravillage roads for the previous 30 years (Appendix 6). In the Bengkulu site, the project road was originally constructed with the active involvement of community members, and the farmers’ association maintained it for a few years but later neglected it, as the villagers felt that they were receiving no benefit from it (Appendix 6). The road consequently reverted to a footpath/track that still appeared to meet their needs. Similarly, in Sorsogon, the level of access on a nonproject road was more than required. The villagers felt that they were neglecting other livelihood activities by maintaining the road regularly and therefore stopped maintenance (Appendix 7). Among the survey respondents who answered, 61% said that they would be prepared to contribute labor for maintenance of rural roads as against 27% who said that they would not. These examples confirm that the level of access required by the poor is basic, but that where this is lacking the potential to engage the poor themselves in the works and maintenance is high.

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10 The needs of the poor are not confined to roads and can include tracks, culverts, crossings, and improvements to intermediary modes of transport.

11 Decisions regarding engineering specifications will have to be sought from technical experts in any case.
Changes in Transportation Services

This chapter describes key impacts that can be expected soon after road improvement, as well as other impacts that may take more time. The evidence from case study sites concerning each type of outcome provides important clues about how project interventions can influence poverty-related conditions that can be affected by road development alone, as well as about other conditions that need additional measures to reduce poverty.

**TRANSPORT MODES, VOLUME, COST, AND COMPETITION**

A widespread traditional assumption governing the development of rural roads is that investment in roads will spontaneously lead to the provision of transport services by the private sector, and this, in turn, will lead fairly quickly to cheaper and better transport for everyone through competition. The case studies suggest that in all project sites, a variety of transport modes emerged, and travel time fell substantially. However, increases in transport volume and decreases in fares occurred only when there was competition among transport providers (Appendix 2). Competition is clearly the critical precondition for the development of better transport services. But the relationship among rural road investment, transport service development, and competition is not straightforward, and an automatic link cannot be assumed. There are intervening factors and contextual barriers. Rural roads, by definition, often serve remote areas; distances to more urbanized centers may be long, population density low, and market information and demand imperfect. Both the development of available transport and lower transport fares rely heavily on the competitiveness of prevailing transport markets. In the absence of competition, there is no incentive for transport providers to improve their service or to pass on their cost savings to consumers.

**PRECONDITIONS NECESSARY FOR THE EMERGENCE OF COMPETITION**

All of the case studies witnessed an increase in the number of vehicles using the road. There was also an increase in the availability of transport services. However, it is not clear whether there was a reduction in transport costs to consumers. Rehabilitated roads significantly reduced the VOCs of existing transport service providers, largely through a reduction in maintenance costs. Across all case study roads, operators came to spend less money on maintenance of their vehicles and lost fewer days a month to repairs. Whether these benefits were passed on to service users depended heavily on the level of competition that developed along the roads. For competition to emerge, certain preconditions must be present, which this section discusses.

**Demand**

Potential demand must be there in areas served by the rural road for both commercial and personal travel. Potential demand is closely linked to population density and the agricultural potential of the area. Little competition among transport providers emerged in the Kurunegala project site due to lack of demand caused by low production, which, in turn, stemmed from a severe drought that lasted 3 years. In contrast, in the other project site, Matara, competition was emerging rapidly, fueled by the demand for green-leaf tea (Appendix 5).

**Distance to Markets**

In the case of the Yogyakarta project road, which is relatively close to market centers, the benefits...
are clear. The improved road surface reduced the VOCs for vehicle providers, more providers were attracted to the route, and more competition and a variety of available transport services resulted. Transport operators had to reduce fares and no longer ran full vehicles, but spent much less on vehicle maintenance and were able to make more trips a day because of the better surface, thus earning higher income. In contrast, the longer distances to markets and networks kept competition weak in Bengkulu. Although the availability and frequency of transport services increased in both the Bengkulu and Yogyakarta project sites, the transport prices did not fall for the district asphalt road in Bengkulu.

**Maintenance**

Evidence from the control area in Yogyakarta also points to the importance of road maintenance. The high demand for services driven by the agricultural potential of an area is not sufficient for competition to emerge; transport providers gravitate toward areas with better roads. The control area in Yogyakarta had agricultural marketing potential, but the road surface was very bad, and the area therefore lacked transport. In such areas, operators and traders can largely dictate the transport or crop prices, as farmers have no option of readily selling in a wider market outside the community.

**Regulatory Barriers**

The Kurunegala road exemplifies another important factor. The existing regulatory environment for transport services in Sri Lanka makes it more difficult to operate a pickup truck or van as a person-carrier along the road. There is also a long tradition of state-subsidized bus services, making it more difficult for private bus carriers to compete. It is unlikely that the Kurunegala road would be an attractive routing for private operators, as the existing subsidized state bus service more than meets the apparent demand for transport. There does not appear to be the critical mass of repressed demand and available services for a major shift in service provision to take place. In the case of the Sorsogon project road, there may have been other types of barriers. In the Sorsogon study area, there was no automatic direct link among improved roads, more transport services, and lower fares. The number of 3-wheelers plying the route from the study community to the nearby markets increased somewhat since road rehabilitation. Many villagers came to prefer 3-wheelers to jeepneys, which take longer to fill up. But the fare for 3-wheelers did not decrease markedly after road rehabilitation. The demand was therefore not sufficient to force down transport prices or overcome price-fixing arrangements among operators.

Competition, and thus benefits for consumers (poor and nonpoor), appears to occur only once a threshold has been reached. There must be a commercial center of sufficient size within easy reach of the rural area, and there must be a commitment to regular road maintenance. Without maintenance, roads quickly revert to their previous condition, and transport entrepreneurs have no incentive to provide services. Regulatory barriers also play a key role in determining competitive mechanisms. Informal barriers such as price-fixing monopolies and group-based restrictions on the open entry of operators to the market can be significant barriers. Government actions, too, can repress competition. The creation of subsidized services in areas with high demand acts as a deterrent to private operators, who cannot compete with subsidized prices. Case study experiences suggest that governments have an important role to play in creating a suitable competitive environment for transport provision in rural areas. In some places, existing demand is low and monopoly practices are simply too prevalent to be spontaneously overcome. Here, governments can play a role in stimulating rural areas and in regulating transport markets effectively to ensure both that benefits from rural roads accrue more equitably and, particularly, that the poor have access to cheaper, more reliable, and more frequent transport services.

**WHO PROVIDES TRANSPORT SERVICES?**

Having established the conditions for competition to emerge, the transport service providers and their socioeconomic status are discussed in this section, considering the relationship among improved roads, better services, lower prices, and the impacts on different groups within and outside the community. A critical question is whether the poor...
and very poor are able to make use of the better availability of transport services, and whether transport prices will fall sufficiently to make the services affordable to them. Do the livelihood strategies of the poor require them to access transport services, and, if not, what barriers do they face in exploring new opportunities through wider and more frequent travel?

**Transport Providers**

Vehicle operators are often winners with both good and bad rural roads:

- They can monopolize transport routes along poor roads, where competition is weak, and dictate prices and the level of service.
- They also benefit from better roads through lower VOCs and reduced maintenance costs.

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**BOX 4**

**A Vehicle Operator—Kurunegala, Sri Lanka**

Mr. D owns the only vehicles in Nugannoruwa—a truck and a minivan. His is one of the better-off families in the village. He has land of his own and also married into another landowning family. He has about 6 hectares of rice land, but, like others in the village, has not farmed for several years because of the severe water shortage. He currently only farms his chena (dry) lands for household food. In the meantime, he has developed two transportation enterprises to compensate for the lack of farming, and his income now is at least equal to, if not better than, previously.

Mr. D bought a second-hand truck with his savings from farming and now uses it to collect dry cow dung from Nugannoruwa and other villages along the road. This activity has been taking place in the village for at least 10 years, but Mr. D started only 2 years ago. Villagers were well used to selling dung by then, and he has no problem with supply.

He employs three people to drive the truck and collect the dung, and he collects a truckload from along the road every day. Once collected, the dung is sold to farmers along the roads in Kalpitiya, a vegetable-growing region, where the demand for manure is high. Mr. D says that he can easily sell the manure, but he sometimes has to wait for payment. He plans to expand the business to bring back vegetables from Kalpitiya for sale in the vegetable wholesaling area of Dambulla.

He pays about SLR500 for one truckload of dung and makes about SLR1,000 (US$10.68) after deducting all his costs. It may take up to 2 weeks to collect half a truckload from villagers who have about 25 cows. Families with only a few cows get together with others to fill the truck. Mr. D started the business once the road had already been rehabilitated, so he cannot comment on whether the road improved his business, but he feels that the completion of the bridge further along the road (undertaken by the project) has been of enormous benefit in improving access along the road. He faces no difficulties in driving along the road any time of the year, and feels the surface is now much better than before.

Mr. D does not use the van for business daily, but hires it out fairly frequently to villagers. The most popular trip is to Anuradapura for pilgrimage, for which he charges SLR2,000. He makes this trip about once a month. He also takes villagers to the south and to the coast, for which he charges SLR5,000. He made this trip three times last year. He has a driver to whom he pays 20% of the revenue. The van also plays an important social function as the informal village ambulance. Villagers know that they can rely upon Mr. D to take them to the hospital in an emergency, day or night. This happens two or three times a month on average, and although he does not ask directly for payment, there is an accepted charge of SLR250 for a trip to the Kotawehera Hospital, and SLR400 to Nikaweratiya. Villagers always pay as promptly as they can.

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**Vehicle operators hire out vehicles to villagers for pilgrimages, social functions, and urgent trips to hospitals.**

**This vehicle collects cow dung for selling.**
They can save time on better roads, leaving them more opportunity to engage in other activities.

They appeared to be the primary beneficiaries from road improvements in almost all of the case study areas (see Box 4).

In most sites, there were a few operators of large vehicles on improved roads, but they were based in the larger towns at either end of the road. Operators of smaller motorized vehicles, however, particularly 3-wheelers, were often based in the study communities. Owning and operating a 3-wheeler is a significant income-generating activity for better-off people who have the initial capital and sense of security to invest in one.

**Traders and Intermediaries**

Traders and intermediaries are a feature of all of the agricultural areas covered by the study. They were not typically resident in the study villages, but rather were usually based in nearby town centers. They were also often transporters in their own right, owning and operating a vehicle to conduct their business. Like transport providers, traders benefit from both poor and better rural roads.

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**BOX 5**

**A Successful Trader—Bengkulu, Indonesia**

The wealthy E family has been successful in business since 1997, when the main road to the village was asphalted. The family's businesses are crop trading and rice milling. The other sources of family income are rice fields, coffee plantation, and rubber plantation. The family also has a pickup truck to support its businesses.

Before starting these businesses, the family left the village for 4 years in 1993–1996 to do business outside. They stayed in Benuang Galing Village, North Bengkulu, about 150 kilometers from Talang Kabu Village. Mr. E says that Talang Kabu Village was bad for business before 1996. Much agricultural production could not be sold outside the village. People had to transport the crops on their shoulders or by pull carts. The E family worked as small traders who collected and sold many kinds of crops. The business was not growing well because of competition with many other traders in North Bengkulu.

At the end of 1996, when the Talang Kabu Road had already been asphalted, the family came back to Talang Kabu to live and started a business in the village. They started with a small capital of Rp1,500,000 (around $562 at the rate of Rp2,300 per $1 in 1996). They bought coffee, rubber, paddy, maize, and other crops from farmers in the village. Mr. E took advantage of the better transportation conditions. At the end of 1996, he rented a pickup or a truck for crop transportation from the village to Bengkulu once a week. The family made a net income of Rp500,000 per month. In 1997, the volume of the trading increased, as did the frequency of crop transportation to an average of twice a week, and they made a net income of around Rp1,250,000 per month.

Despite the monetary crisis of 1997, agricultural production increased. Mr. E took the opportunity to multiply his trading volume, so that from 1998 to 2002 the frequency of his trips increased to three or four times a week; he had an average income of Rp3,000,000 per month. In 2000, the family bought two pickups and one rice milling machine. Mr. E says that he is not in competition with the other traders inside the village because he is a bigger trader; in fact, he helps the other traders with capital to expand their businesses. He buys paddy at Rp950 per kilogram (kg) from the farmers and sells it at Rp1,200 per kg to the main trader in Bengkulu. If the farmers sell to the market, the price is Rp1,000 per kg. Mr. E buys rubber from the farmers at Rp1,750 per kg and sells it at Rp2,100 per kg to the main trader in Bengkulu. If the farmers sell to the village cooperative, the price is Rp1,850 per kg.

The family makes good use of both the main road built by the Public Works Services and the farm road built by the Tree Crop Smallholder Sector Project. Mr. E and his wife say that their pickup now brings paddy from the field to the miller, and coffee from the plantation to their house. It was impossible to do this before the farm road was built. They say that they and other traders would benefit more if the government improved the farm road and the main road; they are ready to contribute to it and to persuade the other traders to do likewise.
When the road is bad, they can often establish a monopoly position, buying primary products at prices they themselves dictate, as theirs is often the only truck visiting the village. With improved roads, they can transport more produce and increase their income, although they may be subject to a more competitive environment, with more traders attracted to using the road to buy products from the agricultural hinterland (see Box 5). Farmers themselves can also take advantage of better road access, faster travel times, and more available transport services to explore wider markets in urbanized areas, where the demand for commodities is likely to be higher, and so the price. However, evidence from the Indonesian sites suggests that, despite the improved transportation links, traders and agricultural intermediaries are able to maintain their monopoly position in the commodities trade, because farmers are locked into relationships of debt with them (Appendix 6).

**BOX 6**

**A Very Poor Family—Bengkulu, Indonesia**

Mrs. F lives with her husband (the household head) and three sons (9, 15, and 18 years old). The living conditions of this very poor family are substandard and unhealthy (4 meters x 6 meters, grass roof, bamboo walls, and earthen floor). They earn their living by farming, collecting firewood, weaving baskets, and sometimes catching fish using a traditional net. These means of livelihood are all temporary, and incomes are unpredictable. They work hard to achieve an average net income of Rp100,000 (US$10.19) monthly. The oldest son completed elementary school but stopped school because the family could not pay for his schooling, and he had to help his father earn a living.

Mrs. F says her family does not benefit from the district road that crosses the village because they do not go outside the village for work or other needs. As laborers, they benefit more from the farm road (Tree Crop Smallholder Sector Project road). Before the road was built, they could carry only 35 kilograms (kg) of crops by pull cart from the plantation to the farmer’s house, which would usually take about an hour. In half a day, they made only Rp2,000 (US$0.20). With the construction of the farm road, they can now bring about 100 kg of crops in 45 minutes. This results in about Rp6,000 (US$0.60) for half a day’s work. The rest of the day is spent weaving baskets, whereas before the project, they would already be too tired to work. It is also easier for them to go to the farmers’ rice field and plantation for other kinds of jobs and to bring firewood from the forest.

Before the farm road was built, they were more involved with basket weaving, catching fish, and collecting firewood than with working as farm laborers, because as farm laborers they received a maximum of Rp3,000 (US$0.30) per day. Since the farm road was built, they prefer working as laborers, because they earn twice as much. They do not want the farm road to be asphalted, because when the farmers use pickup trucks to transport their crops, the opportunity for carrying will be reduced and there will be less work.

The family income has not increased after the road as those of the traders or farmers have. Job opportunities for farm labor have not increased, but the competition has increased, because it is easier to transport crops by pull cart. The demand for basket production is also not as good as before, because many people do not use baskets anymore. The best source of income for the family now is collecting firewood. Mrs. F says that she knows of six other families who are in a similar condition to her family.

With the road, it is possible to transport produce by carts or tractors rather than hiring a porter.

**Headloading**

Shifting patterns in transportation services may affect the poor either beneficially or adversely, depending on the contextual situation. The example in Box 6 shows how reliant the poor are on intravillage travel as opposed to external travel, and on nonmotorized as opposed to motorized transport. In Bengkulu, prior to the project, poor households were engaged in porterage to bring in farm produce. The headloading was extremely hard. The work was exhausting and did not allow porters to carry out other livelihood activities. Since the establishment of farm roads, however, the work became easier with the ability to use handcarts. Very poor porters increased their income and also engaged in other activities such as basket weaving. The volume of produce moved increased, mainly because of the road. However, the poor in the village were ambivalent about improving the road further, as it would enable vehicles to...
use it, thereby competing with their portering. These thoughts were echoed in control areas throughout the study countries where portage of produce was an important livelihood opportunity for the poor. With better roads and access come vehicles, which can transport more produce. The poor are vulnerable to loss of this livelihood activity and are unclear what alternative benefits would come to them from the roads (Appendix 6).

Changes in Travel Patterns

MODES OF TRANSPORT OF THE POOR

Despite the differences among the case study sites, the travel patterns of the poor and very poor across the study areas appeared to be remarkably similar. Most restricted their travel mainly to the village area and only occasionally went outside the village. Even when the village was close to a nearby marketing center (as in the case of Negros), the poor traveled only on market days, and not regularly. The fundamental reason for this appears to be lack of capital; they had little to sell and little money to buy anything but essential items. They also lacked time, as their days were taken up with subsistence tasks and laboring, and they had little time for speculative activities to diversify their livelihoods. The primary mode of travel was walking, though the poor also used bicycles when they could gain access to them. Poverty was compounded for those in control areas, where remoteness and isolation were greater.

Access to means of transport among those who were in the better-off category of survey respondents was, unsurprisingly, far better than among those who were poor or very poor. About 65% of the better off had a bicycle, against 35% of the poor and very poor. Twenty-five percent of better-off households owned one or more motorcycles, against 4% of the very poor and 9% of the poor. Comparisons among the very poor, poor, and better off indicated that for crop processing, the percentages of each group traveling were 9%, 17%, and 24%, respectively. To sell crops, the percentages traveling were 20%, 16%, and 32%, respectively. In traveling for business or employment, the better off traveled more often, generally more than once a week (i.e., for regular employment). In fact, PRAs in all of the study communities showed that those with a regular government or salaried position were by far the largest subgroup of the better off in all locations.

The responses to the question of whether the condition of the road had changed after rehabilitation were generally very positive (Table 2). Among all project respondents, 59% said that it was better than 5 years before, although 24% disagreed. However, consciousness of the road and its importance seemed to be much higher among the better off than the very poor or the poor. Table 2 also shows that the better off were less likely to give a “don’t know” response, and more likely to give a positive response.

In looking at access to modes of transport, it is useful to consider the buying of provisions, which is a common task. Figure 1 shows the proportionate modes of transport for each group in the project sites. The very poor were much more reliant on walking than the better off. The latter were more likely to have access to private motorized means (motorcycle, 3-wheeler, car, or van). Interestingly, the poor were more likely to use a bicycle,

**Table 2: Change in the Condition of the Road Over 5 Years (%)**

<table>
<thead>
<tr>
<th>Response</th>
<th>Socioeconomic Group</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Very Poor</td>
<td>Poor</td>
</tr>
<tr>
<td>Don’t Know</td>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>Better Now</td>
<td>53</td>
<td>58</td>
</tr>
<tr>
<td>Worse Now</td>
<td>23</td>
<td>26</td>
</tr>
<tr>
<td>No Change</td>
<td>15</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Household survey data.
while bicycle usage among the very poor was negligible. The very poor’s heavy reliance on walking is reflected in other tasks too, such as in accessing health services, going to school, and selling products.

**IMPORTANCE OF ROADS TO THE POOR**

Through the improvement of road surface and the provision of all-year access, the six projects studied allowed better modes of transportation, shorter travel times, and at times even lower travel costs, thereby bringing benefits to those who travel outside the community and its vicinity. PRAs indicated that the poor and very poor inhabit a localized, walking world, and as such make little use of medium- or long-distance transportation links. Of more importance to them is the network of paths, tracks, culverts, and access routes in the immediate village vicinity on which they rely to access water, firewood, fields, and local employment opportunities. Saving time in their within-community travel is important to them. Intermediate modes of transport that help them increase their carrying capacity are also useful to save time for more productive work. Most things critical to their lives can usually be found within the village locale, and travel outside is occasional and for a special purpose. Incremental benefits to them are more likely to come from accessing nonmotorized transport and from the ability to cross waterways, etc. to help in their daily routine tasks. Often, they cannot afford to use motorized vehicles, and these vehicles travel to destinations beyond their sphere of livelihood. Therefore, increasing mobility within the village is as important for poverty reduction as providing access to markets outside the village. The time savings within the village will allow the poor and very poor to be more productive and to generate small savings for exploring opportunities outside the village.

In all of the study locations, men and women had different household responsibilities. As such, they also had different transport and travel patterns and needs. Responses from PRAs confirmed that women across the study countries were deemed to be responsible primarily for household tasks, and were likely to spend more time on them. In their travels both within the community and outside, men and women had different travel patterns, tasks, and responsibilities. In local travel, responses indicated that both men and women shared responsibility for crop production. In water collection, men overall had slightly higher responsibility (30%) than women (26%). In collecting firewood, another major household task requiring travel within the immediate village area, men and women had similar responsibilities. However, in looking at the total time utilized on this task, women spent nearly twice as long on firewood collection tasks as men (42% to 22%).

In the community, the survey showed that women were much more likely to travel for health purposes (55% as opposed to 5% for men), either for themselves or, more frequently, to accompany children. They were also much more likely to travel for provisions within the community, with 46% of responses against 17% for men, and 18% shared...
by both. Men were more likely to travel for crop processing (53% to women’s 14%, with 17% shared), and social travel within the village was largely shared. In travel outside the community, these patterns were broadly replicated. Outside the village as well, men were more responsible for buying provisions and traveling for health reasons, while men traveled outside for employment, crop processing, and selling their produce. Survey returns also showed that, for various tasks, men were broadly more likely to have access to private means of transport like a bicycle, 3-wheeler, or motorcycle. Women were more likely to travel on foot to fulfill tasks, or to use a public form of transport, like a bus or truck. The opportunities for men to travel outside the village were reinforced and perpetuated by traditional gender roles in the study sites, with women responsible for household tasks and men for productive or economic tasks.

Changes in Village Profile

COMMUNITY WELL-BEING AND DEVELOPMENT

The study looked at both project and control sites to discern what the impact of road rehabilitation had been on the general socioeconomic well-being and development of the respective communities. In general terms, the benefits of better roads (to all socioeconomic groups as a whole) were highly evident when project villages were compared with control villages. Average travel time was often half or less for project households than for control households for all types of activities. For a variety of tasks, project households in the survey were more likely to travel on a weekly basis, and control households on a monthly basis. Due to difficulties of access, control site households often had to wait and combine a number of important tasks into one trip to avoid spending long periods of travel for one purpose only. In response to the questions on what the primary purposes of travel were and on how often they traveled outside their village, respondents in project sites and control sites had different priorities (Table 3). Control households traveled more frequently for crop processing and for selling their produce than did project households. This suggests that (i) primary agricultural activities were more important in the control areas, which may have lacked alternative livelihood opportunities; and (ii) due to better access, many of the services that came directly to the project site were not available in the control site. Evidence from PRAs in all locations suggests that, as a broad trend across all three countries, both of these factors were important. Project sites had a wider variety of services (e.g., crop processing) available within

14 The selected project and control areas were similar in their socioeconomic characteristics except for the road; in broad terms, the level of development in the study and control communities prior to the project was similar (Appendix 1).

<table>
<thead>
<tr>
<th>Activity</th>
<th>Project Site</th>
<th></th>
<th>Control Site</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number of Person-Trips per Month</td>
<td>Average Travel Time (minutes)</td>
<td>Number of Person-Trips per Month</td>
<td>Average Travel Time (minutes)</td>
</tr>
<tr>
<td>Buying Provisions</td>
<td>2.0</td>
<td>20</td>
<td>1.0</td>
<td>30</td>
</tr>
<tr>
<td>Selling Crops/Products</td>
<td>1.0</td>
<td>20</td>
<td>2.0</td>
<td>60</td>
</tr>
<tr>
<td>Going to School</td>
<td>2.0</td>
<td>30</td>
<td>1.0</td>
<td>50</td>
</tr>
<tr>
<td>Processing Agricultural Products</td>
<td>2.0</td>
<td>30</td>
<td>2.0</td>
<td>60</td>
</tr>
<tr>
<td>Visiting Family and Friends</td>
<td>1.0</td>
<td>90</td>
<td>1.0</td>
<td>180</td>
</tr>
<tr>
<td>Accessing Medical Care</td>
<td>1.0</td>
<td>30</td>
<td>1.0</td>
<td>90</td>
</tr>
<tr>
<td>Going for Employment or Business</td>
<td>1.0</td>
<td>60</td>
<td>1.0</td>
<td>240</td>
</tr>
<tr>
<td>Obtaining Official Documentation</td>
<td>1.0</td>
<td>30</td>
<td>0.3</td>
<td>110</td>
</tr>
<tr>
<td>Other</td>
<td>1.0</td>
<td>90</td>
<td>0.6</td>
<td>360</td>
</tr>
</tbody>
</table>

Note: Person-trips are number of persons times the number of two-way trips made.
Source: Household survey data.

The poor in project sites were much more likely to use a 3-wheeler or a bicycle.
the village, and were also accessed more regularly by buyers, meaning that primary producers were less likely to have to travel outside the community to sell their produce.

In the project sites, livelihood opportunities outside the village were better as a result of the road. Twice as many study community members had outside employment, business interests, or a secondary income stream than control community members. Project households were more likely to travel to visit friends and family or to fulfill state documentation or administrative tasks than were control households. In terms of the time spent by households in traveling, the project communities demonstrated considerable savings over the control communities.

Evidence from the survey also shows that control community households were much more likely to travel on foot for all tasks. Project households were much more likely to use either a bicycle, motorcycle, or 3-wheeler. In general then, project households had the opportunity to travel more for all tasks; had greater access to and made greater use of transport services; used private modes of transport like bicycles and motorcycles more; and had greater choice in deciding whether or not to travel for tasks like crop processing and selling, as they had a greater variety of services available in the community. Project communities also appear to have had better access to safe sources of drinking water and to have had better sanitary and toilet conditions (Table 4). This may have been a function of the generally increased level of development of project over control sites (itself a function of better access to roads, communications, and opportunities). It also reflects the better accessibility of state services and nongovernment organizations to communities; roadside communities are more likely to have services provided under these schemes. Overall, 19% of all respondents had functioning electricity. The proportion in project locations was far higher (28%) than in control areas, (11%). This, too, was a direct consequence of the better location and accessibility of project areas being beside the road. The level of general education of project households was higher than that of control households. Average years of schooling for the head of household and spouse were 6.4 years in project sites compared with 5.2 in control sites. Roads were clearly a critical enabling condition for development of living conditions in rural areas. However, the distribution of the benefits of these roads within communities is a separate issue, and there are no guarantees or inherent mechanisms to ensure that benefits will be distributed equitably between the poor and nonpoor in communities.

COMMUNITY COMMERCIALIZATION AND THE FLOW OF GOODS AND SERVICES

Direct Benefits
Appendix 3 shows that there are gradations of the poor—from the completely landless to farmers on small plots producing for subsistence to others producing sufficient surplus to sell at certain times of the year. The majority of those classified as very poor or poor are engaged in both smallholder farming and wage labor. They are therefore heavily reliant on the commercialization of agriculture that an improved road may bring. Although average landholdings are small and the potential for taking over more land is slim, roads can potentially bring new demand for commercial cash crops and a resulting increase in price. In addition, extension authorities encourage crop diversification (pili nut in Sorsogon) and intensification (rubber in Bengkulu). A majority of all the respondents (61%) who farmed land said that they produced the same type of crops as 5 years before. However, there was some difference between project sites (55% no change) and control sites (67% no change).

Figures for the sale of agricultural produce were broadly similar between the project and control sites, with 53% of project and 55% of control respondents selling some of their crop. Responding to whether they sold a greater quantity now

<table>
<thead>
<tr>
<th>Facility</th>
<th>Project Site Share of Households (%)</th>
<th>Control Site Share of Households (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protected Well or Tap</td>
<td>37</td>
<td>35</td>
</tr>
<tr>
<td>Private Well or Tap</td>
<td>28</td>
<td>14</td>
</tr>
<tr>
<td>Piped to House</td>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>Unprotected Well</td>
<td>11</td>
<td>24</td>
</tr>
<tr>
<td>Private Rainwater Tank</td>
<td>4</td>
<td>17</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td>Sanitation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Private Flush</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Private Latrine</td>
<td>53</td>
<td>31</td>
</tr>
<tr>
<td>Public Latrine</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Open Pit</td>
<td>20</td>
<td>22</td>
</tr>
<tr>
<td>Field</td>
<td>15</td>
<td>29</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>Electricity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>28</td>
<td>11</td>
</tr>
<tr>
<td>No</td>
<td>72</td>
<td>89</td>
</tr>
</tbody>
</table>

Source: Household survey data.
than 5 years previously, 67% answered that they did. Among those who did sell more, about 8% attributed this to better production techniques, 8% to more buyers visiting the community, and 5% to better opportunities to visit outside markets. Among project respondents only, the percentage who were selling more and who attributed this to better outside marketing opportunities was higher, at 12%. Comparing socioeconomic groups, 71% of the very poor and 70% of the poor said they did not sell more now than before road rehabilitation; only 48% of the better off made the same response. This suggests again that the opportunities for com-

In project sites, some had better marketing opportunities.

**BOX 7**

**A Household Successfully Moving out of Poverty—Negros, Philippines**

The G family is the most enterprising in the whole village in terms of finding ways to maximize the opportunities that improved roads can bring. They are the only family that has continually met the fish requirement of the village for more than 25 years. Through the joint efforts of Mr. and Mrs. G, they have been able to raise and provide education to their 11 children aged 5 to 28. The eldest is married with two children and has his house just behind the parents. He actively helped in the family business to raise enough money for the education of his younger brothers and sisters. Consequently, he completed only the first year of college education (11 years of schooling in all). Three children completed college degrees: two are employed in Manila, and one has just completed a degree in education. Of the six children of school age, only five are currently studying: two in high school and three in elementary. The one not attending school completed high school last year but had to postpone studying, as the family decided to first let his sister finish her degree. As his sister completed her degree in March 2002, he was to start college the following school year. The youngest son is not yet of school age.

Their current house is situated along the barangay road 75 meters from the project road; is made of cemented floor, wooden walls, and galvanized iron roof; and was built in 1990 on one of the hacienda’s vacant lots. This is their second house on the same piece of land.

Their first house was a small hut built in 1974 after their marriage, with her husband accompanying her in buying and transporting fish from Barangay Sarait, Himamaylan. As fish demand in the village increased, so did sales. Then she had difficulty physically peddling the fish, so she and her husband constructed a makeshift stand in 1986 with just a table and temporary roofing along the project road in the village. Together they go to Sarait at 9 a.m. every day by renting a tricycle at P120 per round trip. They get back to the village between 1 p.m. and 2 p.m., depending on fish availability. As they have established credit lines, they get the fish on a consignment basis. They usually have 2–3 boxes of fish daily at 40–50 kilograms (kg) per box. They start setting up the fish at their stand at 3 p.m. and close at about 6 p.m. On days when they have a surplus, Mrs. G peddles the fish in the village or simply dries it for sale over the following days. The price of their fish ranges from P50 to P120 per kg. They usually have a 20–30% profit margin and earn at least P350 (US$6.83) per day. Their fish stand has become the center of village information, as people usually exchange information while buying.

With over 25 years of using the road, Mr. and Mrs. G have seen how it contributes to the development of their village. They are the only family that fully utilizes the road to the extent of graduating into a nonpoor household. They have observed that more people in the village are investing in transport facilities as their source of livelihood.

Before project road rehabilitation, there were only two or three tricycle owners in the village; now there are about 25. Mr. and Mrs. G can now leave home in mid-morning instead of early morning to be at the fish-landing center on time. About 30% of their customers are project road users. People traveling to barangay Cabacungan, La Castellana, and Carla-on City stop at their stand to buy fish. ■
mercialization are much greater for the better off than for the poor and very poor.

Improved roads clearly improve general opportunities and the environment for buying and selling, particularly selling to visiting buyers (Box 7). In the project sites, 54% of households said that more buyers visited the community than 5 years previously compared with 36% in the control households. With respect to transporting produce for sale, the poor and very poor were still much more likely to lack access to transport services than the better off. Among all respondents, 71% of the very poor said that their primary transport means for crop sale was on foot, against 63% of the poor and 46% of the better off. The importance of better roads to crop commercialization can be seen in Table 5. For control communities, the primary condition necessary for the better marketing of crops was deemed to be better roads as well as better transport services.

Where there is no state or project support for creating the infrastructure and enabling environment for diversification of production, the degree of integration of the local area into the cash crop economy is crucial. The comparison of the Kurunegala and Matara project sites in Sri Lanka (Appendix 5) demonstrates clearly the importance of the prevailing context and traditions in determining peoples’ response to the potential opportunities that better roads may bring. In the Sorsogen survey, respondents said that there were no discernible differences in the pattern of sale and commercialization of the crop compared with before road rehabilitation, and no cash crop alternatives had developed. This was probably a result of the structure of land ownership in the area, with most farmers operating as smallholder tenants (Figure 2), and often committed to selling their crop back to their landlords as part of the tenancy agreement. Collection and sale of forest products is an important livelihood resource that developed in the Indonesia and Philippines case study areas. The Yogyakarta and Matara study areas witnessed an increase in seasonal transit markets along the road for the sale of crops. Transit markets act as collection points for visiting intermediaries to buy produce at peak agricultural times. Their presence suggests increased agricultural intermediary activity in the study area following road rehabilitation. However, many poorer farmers in the area were chronically indebted to these same intermediaries, and so had little scope for maneuver in deciding whom to sell to and at what price. Better access does not necessarily lead to better prices for poor farmers.

### Table 5: Conditions Necessary for Better Sales of Agricultural Produce (%)

<table>
<thead>
<tr>
<th>Condition</th>
<th>Project Site</th>
<th>Control Site</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>More Buyers in the Community</td>
<td>15</td>
<td>11</td>
<td>13</td>
</tr>
<tr>
<td>Better Prices for Goods</td>
<td>15</td>
<td>9</td>
<td>13</td>
</tr>
<tr>
<td>Better Roads to Travel to Market</td>
<td>10</td>
<td>28</td>
<td>19</td>
</tr>
<tr>
<td>Better Transport Services to Market Centers</td>
<td>5</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>More Frequent and Reliable Transport</td>
<td>2</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Cheaper Transport</td>
<td>2</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>Respondents Who Do Not Sell Produce</td>
<td>39</td>
<td>27</td>
<td>33</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Household survey data.

Project households felt that better prices and more buyers in the community were important, but otherwise would appear to have felt that the conditions for selling their crops were broadly present.

### Indirect Benefits

Road investments had significant indirect impacts on the general level of economic development in each of the study locations. This is clear from the development of small businesses in the project communities. See, for example, Box 8. Improved roads and the better ability to transport goods provide opportunities for those who can afford the investment to start a small store in the village or to buy village produce or to make their own and sell it in the nearby market centers. They also save people time, allowing those with skills and/or savings to invest in other small businesses. Among project respondents, 64% observed that the number of small businesses in the community had increased since the road was built or rehabilitated. Of those who had a business prior to the rehabili-
Mr. H (50 years old), his wife (49), and their 18-year-old daughter make up the household. They are one of the very few families in Nugannoruwa who have completely given up farming despite owning both paddy and chena (dry) lands. The primary occupation of the family is a confectionery enterprise, producing about 10 varieties of sweets. Mr. H travels to Nikaweratiya to purchase all the necessary raw materials such as rice, sugar, and oil. He does not have to transport firewood, as it is delivered to their house in bulk. Mrs. H is responsible for the preparation of the sweets. They both take them to the market to sell.

As can be expected, transport is crucial to the functioning of the business. Mr. H makes at least four trips a week to Nikaweratiya to buy raw materials. Together they make three trips a week to market their products. The single most important factor in making the business viable is access to transport. Their house is situated just by the road, which helps the process of moving raw material and finished products. For all trips to Nikaweratiya, Mr. H uses the public bus. Though there is no official bus stop by his house, the bus driver always stops by his compound to enable easy loading and unloading. An extra payment of SLRs20 is charged on days that he carries more than one sack of goods. When traveling to the markets in Nikaweratiya and Anamaduwa with the products, they prefer to use a 3-wheeler. They spend a total of SLRs400 for the two trips. This is a special rate fixed with their regular 3-wheeler driver. The return trips are made by bus, as they have no cargo. This costs them about SLRs75. The 45-kilometer trip to Puttlam is done purely by bus. They take the 6 a.m. bus to Nikaweratiya and then the Puttlam bus. The fact that the bus leaves early and is very reliable is a critical factor in their accessing the larger market in Puttlam.

The family is currently thinking of expanding the business by employing village women to make the sweets and by visiting more markets. A major constraint to further expansion is Mrs. H’s health. Two months ago, she was diagnosed with a serious spinal problem. However, they hope to cope with it by hiring women to make the sweets.

Their clay and cadjan house is in a very poor condition. There are no doors or closed-off spaces in the house, and minimal furniture: 12 plastic chairs stacked in a corner at the front and a single bed in the back. If judged visually, it would seem that the quality of life of this household is lower than the village average. However, Mrs. H feels very strongly that it is actually better than the neighbors’. Despite the fact that they have so far been unsuccessful in improving their housing conditions, there is a constant flow of cash in the household. While they have to buy all consumer goods including rice, they have the advantage of being able to get bargains at the end of the market day. Hence, they spend less than if they had to buy from retail shops. Crucially, they have the knowledge, assets, business networks, and motivation to be sustained by a livelihood strategy that is not dependent on rainwater nor threatened by elephants. Mrs. H considers the ability to move away from nonviable farming and to have the motivation to take advantage of opportunities available as critical. “I tell the women, let’s do it. I’ll find you buyers. If enough of us make sweets, buyers will come to the village, as they do in Aluthgama.”

With the availability of transport, some can start small businesses.
MIGRATION AND REMITTANCES

Better roads offer an expanded scope of opportunity outside the village. But there appears to have been no significant link in the study areas between migration for employment and poverty status—if employment is short term or seasonal and badly paid, then it is unlikely to be secure and regular enough to replace existing income and subsistence activities. Seeking outside employment opportunities, particularly in urban areas, can be a high-risk strategy for the poor and very poor. A traditional assumption about the mobility of the poor is that their lack of agricultural assets, particularly land, makes them more likely to seek employment outside the community. However, labor markets in remote rural areas are imperfect, and accessing opportunities is difficult, particularly where there is a lack of information. This lack of information and inability to command rights over work opportunities are themselves a function of poverty. Better-off households are much more likely to have access to information on well-paid, or stable, outside employment, with the poor and very poor accessing only temporary, seasonal, and unskilled work opportunities, which are usually poorly paid (Appendix 6). Lack of education and lack of support networks in more urban areas compound this trend.

Evidence from the study communities suggests that the more severe the degree of poverty, the less likely household members are to travel outside the community. The exception to this appears to have been the Sri Lanka case studies, where there appeared to be a higher level of mobility among all socioeconomic groups. Sri Lanka’s small size, high density of population and settlement, and high levels of literacy and human development may account for this. In the other case study areas, the mobility of the poor and very poor stemmed largely from the search for seasonal wage labor opportunities that were close to existing locations and usually for a short period (up to 3 months) only. Among all survey households that provided valid responses, 68% did not work away from the community at any time of the year. Analysis of the results from the remaining 32% shows that two kinds of migration were clearly taking place:

- seasonal, relatively short-term migration to other rural areas, usually in the same district, in search of agricultural wage-labor opportunities; and
- relatively longer term migration to urban areas in search of nonagricultural employment.

In looking at the activities in which the migrant laborers were engaged when working away, it is clear that project households had access to better opportunities for employment outside agriculture. More were employed either in regular jobs or in other activities such as urban, relatively longer term, employment. Among all survey responses, temporary and seasonal work accounted for 62% of all outside employment and activities. In terms of the time spent away from home, 25% of all outside activity was weekly, i.e., for regular employment that might require staying in town during the week and returning to the village over the weekend. A further 20% was accounted for by temporary employment of a month or less. Information collected during the PRAs indicated, however, that employment, as an alternative activity to farming or wage laboring, was not a guaranteed means of accumulating income. Alternative employment strategies need to be sufficiently secure and well paid to replace the income and security of the activity that has been neglected or abandoned.

The differences between the project areas and the control communities are shown in Figure 3. More members of the project sites worked away than those from the control sites. Those from the project sites were more likely to work in a rural zone in another district or in the national capital. More men than women were likely to work away, but of the women who did work away, a larger proportion were employed in the capital or other cities, and fewer in rural zones, implying that they were more likely to move for skilled or semiskilled nonagricultural labor than for seasonal agricultural work in the immediate locality.
Changes in Income and Welfare

The multidimensional poverty definition used in the study considers that poverty reduction can come from changes in sources of income and better accessibility to social services. Diversification of income can reduce vulnerability to external shocks. Improvements in rural roads are expected to generate new opportunities to earn income and enhance accessibility to other essential services. This section presents evidence from the case study areas about changes in income sources and welfare, and how such changes relate to different socioeconomic groups.

FOOD SECURITY

Food security is a critical indicator of poverty common to all of the study locations. A large part of each community was affected by lack of food at critical points of the year. Overall, 74% of all survey respondents reported facing some food shortages during the year. This broadly corresponds to the poverty classifications discussed in Appendix 3. It was only those who were considered better off or rich who were completely free from any food difficulties. Of those who reported food difficulties, marginally fewer lived in the project sites than in the control sites (Figure 4). There was also little difference in the reported number of months of food insecurity between the sites, suggesting that food insecurity affected a broader group of people. However, more project than control respondents felt that food security had improved, and fewer reported that it had worsened, suggesting that there may have been some connection between improved food security and the road improvements. Among the very poor in the project sites, 49% felt that the situation had worsened, in comparison with 47% of the poor and 28% of the better off. This may have been a result of several other factors that influence poverty.

HOUSEHOLD INCOME

Better-Off Groups

All groups in the study villages potentially benefited from the improved opportunities that better roads brought. There was better availability and mix of transport services, and increased flow of goods and services. The project and control sites studied are primarily agricultural communities and, hence, vulnerable to natural shocks or fluctuations in commodity prices. Their ability to diversify to other sources of income is, therefore, important to reduce poverty. In practice, of course, it is those who are most secure and who have savings who are able to make the best use of the opportunities better roads may bring. In fact, case study evidence suggests that better rural roads allow those with some savings to diversify into activities with substantially better returns. Potential benefits from better road access and transport services appear to have increased in relation to the degree to which households were nonpoor. The better off had surplus funds to invest in trading (even at very modest levels), had an agricultural surplus to sell, or had a network of connections and relationships outside the community that enabled them to take advantage of trading or working opportunities. They had the security to be able to explore outside the village and the immediate locale for opportunities to diversify income and livelihood. People engaged as salaried workers in nearby town centers relied on a regular and rapid link and so benefited substantially from the efficiency and cost savings in commuting. They were heavily represented among the households considered better off in the study sites.

15 The study assumed that the poor and very poor, being risk averse, will not diversify to other sources of income unless it reduces their poverty status.

16 Though difficult, a common definition of food security was applied across the three countries. Food security was defined as having sufficient food to meet the household’s daily needs during the normal productive activities of its members.

17 The better off in the study communities are not poor in a national sense (Appendix 3).
Improvements in income were a key area of inquiry for the household survey. Table 6 shows that a substantial proportion of villagers reported no change in income sources, reflecting their lack of prerequisites to diversify. Those reporting no change were higher among control group (58%) than project (47%) respondents. Among all socioeconomic groups, a shift away from agriculture in the past 5 years was more apparent in the project sites than in the control sites. Of all project site respondents, 23% reported receiving less income from agriculture, and more from other sources, against 14% of control site respondents. Of the different socioeconomic groups across all study communities, the better off had both diversified and increased their income more than the poor and very poor. About 22% of better-off households reported increasing both agricultural and other sources of income, whereas more than 50% of both the poor and very poor groups reported no change at all in sources of income.

All socioeconomic groups spent an approximately similar proportion of household expenditure on transport and travel—5% on average. In response to what plans they had to increase income in the future, control households showed themselves more likely to expand agricultural production (29%) or to raise small animals for income (22%), whereas project households appeared more likely to arrange a job locally (7%) or to start or expand a small business (25%). Differences were also clear between socioeconomic groups in how they planned to respond to the better opportunities that roads might bring. Of the very poor, 29% had no plan to diversify or increase income, against 18% of the poor and 15% of the better off. The better off were twice as likely (34%) to start or expand a small business as the very poor.

### Table 6: Change in Sources of Income Over the Past 5 Years (%)

<table>
<thead>
<tr>
<th>Change Type of Site</th>
<th>Type of Site</th>
<th>Socioeconomic Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Project</td>
<td>Control</td>
</tr>
<tr>
<td>No Change</td>
<td>47</td>
<td>58</td>
</tr>
<tr>
<td>Less Income from Agriculture, More from Other Sources</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>More Income from Agriculture, Less from Other Sources</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>More Income from Both Agriculture and Other Sources</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>More Money Sent from Outside</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>12</td>
<td>14</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Household survey data.

**Figure 5: Frequency of Use of Transport Services**

(project sites)

Poor and Very Poor Groups

Transport needs are clearly different for different socioeconomic groups. The case studies show that most of the journeys made by the rural poor were for subsistence and household tasks rather than for activities that were directly productive in an economic sense. For the rural poor, access to local facilities and the primary transport network is critical during times of need. The poor lack both time and energy; and impacts that either reduce or exacerbate these deficiencies have a critical bearing on poverty. Survey responses among different socioeconomic groups in the project locations show clearly how the use of transport services differed (Figure 5). Among the very poor, 47% said that
they used transport only occasionally because they had little need for traveling outside the community more regularly, compared with only 21% of the better off and 30% of the poor.

There is little evidence from the case studies of an increase in personal mobility among the very poor in search of job opportunities outside the community or for any other reason following road rehabilitation. But where the economic conditions were right, better basic road access could affect the local wage-laboring and trading prospects of the poor, and thus enable them to benefit from wider processes of increased agricultural commercialization and trade, facilitated by better roads (Appendix 5). In the study areas, a few households graduated from poor to nonpoor status because of the opportunities that the road provided. See, for example, Box 9.

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**BOX 9**

**A Household Making Use of the Road and with the Potential for Moving out of Poverty—Negros, Philippines**

Mr. and Mrs. J have one child. They have been living in their current house, which has grass thatch walls, packed clay floor, and galvanized iron sheets on the roof, about 50 meters from the project road, for the last 4 years. Prior to their transfer, they lived in Valderrama, Antique, Mr. J’s home place, after their marriage in 1995. He was then helping his parents on their farm and doing carpentry work. The family of Mrs. J is from Magallon Cadre. His mother-in-law encouraged Mr. J to move his family to Magallon Cadre in 1998, as at that time the local government was giving free access to land for those with a family who wanted to relocate to the village.

As they have no land to farm in Magallon Cadre, Mr. J works as a carpenter, accepting wages of ₱100 (US$1.95) per day provided the food is free. He gives priority to carpentry work over wage laboring in a hacienda, as the pay for the former is much better. But if carpentry work is not available, he does not mind laboring in a hacienda. As a farm laborer, he earns only ₱70–₱100 (US$1.37–$1.95) per day without food, depending on the nature of the job. Recently, he established a network with local contractors engaged in building and repairing houses not only in the village but also in other villages of Moises Padilla. This has substantially expanded his earning capacity. He is known in the village to be a reliable carpenter.

Though he was not in the village before the road rehabilitation, Mr. J has observed that transport services along the project road have been expanding every year. As cement, lumber, and roofing materials are sourced as far away as Bacolod City, he knows that a good road network has made a substantial contribution to decreasing the cost of materials and making delivery faster; this also facilitates his repair or construction activities. The availability of motorized transport in the village has reduced his travel time, leaving more time for carpentry. In the last few months, he traveled mainly on foot, as most of his job orders were within the village. He and his wife travel weekly to the market center of Moises Padilla, mainly to buy foodstuffs such as rice and fish. The family has to buy most of their foodstuffs, as they have no land to grow staples or vegetables of their own.

Mrs. J sometimes peddles various foodstuffs such as salted or boiled peanuts and salad jackfruit that she herself prepares or processes. All she needs is capital of ₱1,000 to start peanut processing. She usually engages in this business from October to December in the town proper and surrounding areas, coinciding with the peak supply of peanuts. During these months, she can easily earn a net income of ₱300–₱400 (US$5.85–$7.80) per day. When there is no cheap supply of peanuts, she shifts to making and selling jackfruit salad, from which she can earn as much as 40% on her capital; but she can do this only on a much reduced scale. Her transport cost from the village to the town proper and return of ₱10 is affordable as long as she has business. In the whole village, only two are doing this kind of activity. The availability of tricycles has enabled her to move to the other barangays of Moises Padilla. She feels the business of selling peanuts has more potential than jackfruit salad, as she can easily sell all the peanuts within the village and surrounding villages. This gives her the reason to travel outside the village; otherwise, she goes to the town proper only with her husband to buy essential household items.

Although still poor, Mr. and Mrs. J are slowly finding ways to increase their household income. They feel they will have enough resources for their 5-year old daughter to obtain a college degree if they can expand their business connections in the village. Mrs. J is now pregnant, so they are thinking more about increasing their household income. For them, good roads and better transport services contribute to the overall development of their community, which ultimately expands their livelihood capabilities.
WELFARE INDICATORS

Previous sections have shown that direct benefits of rural road improvements appear to go substantially to transport operators and better-off members of the communities along the road who use the road regularly and rely on it for their business or employment. The poor and very poor use the road irregularly for occasional but necessary travel and do not depend much on fast and reliable transport services. Many of the perceivable benefits of rural roads to them are indirect and nonquantifiable, but very important nevertheless. These indirect impacts are discussed in detail in the following sections.18

Safety Net for a Crisis

In circumstances where conditions for agriculture are difficult, the road proved to be an important safety net of sorts in generating alternative liveli-

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BOX 10

**A Cooperative Society Helping Poor Households to Cope with Crisis—Kurunegala, Sri Lanka**

Weeragama is the neighboring village to Nugannoruwa (the project site), and has a milk-collecting center for the milk cooperative society. Villagers from Nugannoruwa belong to the cooperative, as well as people from other surrounding villages. The state-sponsored cooperative started here in the village in 2001. It grew out of a project called “Dairy Milk” that had operated in the area for 5 years previously. Once that project finished, villagers decided to start a cooperative themselves. It is part of a regional network, with a sector officer based in the nearby town of Nikaweratiya. The cooperative is open to all villagers. They simply need to sign up; there is no joining fee. For farmers, a key purpose in starting the cooperative was to collect and market milk for themselves, cutting out the intermediaries. Whatever the cooperative gets for the milk is passed on to the farmers. The milk-collecting center is in the compound of Mr. K (pictured), who is the local secretary of the coop. His house/shop is beside the road, and people bring their milk to him in containers on foot or by bicycle. He receives a commission of 25 cents per liter collected. Every morning, a milk truck hired by the central cooperative visits the collection point and collects the milk. Weeragama is the last stop of the collection truck, which continues to Kuliyapitiya, where the milk is sold to a factory that processes flavored milk, yogurt, etc. and also supplies Nestlé.

The peak season for the cooperative is January–April, the wet season, when cows produce 50% more milk. Members are paid SLRs25 per liter for buffalo milk and SLRs13 per liter for cow’s milk depending upon the fat content determined by Mr. K using a simple centrifuge. The other main outlets for milk in the neighborhood villages are the motorscooter collectors, who ply their trade along the road. They pay SLRs22–23 per liter for buffalo milk and SLRs10–12 per liter for cow’s milk. There is thus not only an economic incentive for farmers to use the cooperative, but the coop will also take all the milk that they produce, so they have a guaranteed sale. Motorcycle collectors do not guarantee that they will purchase every day, nor do they pay on time. The cooperative currently produces approximately 300 liters per day.

The improved road has resulted in an increase in the milk trade, with more motorscooter collectors and with more people joining the cooperative every year. The improved road has meant that the milk truck can come to collect the milk every day of the year. Previously, the road was treacherous during the rainy season, sometimes inaccessible, and the surface was in a poor condition, resulting in slower transport times and damage to vehicles. Given the necessity of transporting fresh milk quickly, the road is important in making the whole enterprise viable. The better road has also given farmers the confidence to invest time and resources in developing cattle holdings, because the truck will come whenever they have milk to sell. During the long dry spell, too, the development of the milk cooperative and the guarantee of good access for the truck meant that villagers had an important alternative source of income while their lands remained dry and unproductive.

18 Improvement of social activities to attend social and religious events and strengthen family networks is an important advantage of rural roads, though not elaborated on here.
hood opportunities. The severe drought over 3 years in Kurunegala heavily impacted on the landless who were employed in the fields of the landowners in a variety of tasks throughout the year. All were forced to seek alternative ways of generating income and securing their basic needs, and the road was crucial in the development of these alternative livelihood strategies such as raising livestock (Box 10). This alternative income stream, though temporary or seasonal, was important for household food security. A good road surface and the guarantee of all-year accessibility appear, therefore, to be important prerequisites for the development of any kind of regular enterprise, and the road in Kurunegala proved to be an important enabling factor in offering villagers such security in difficult times (Appendix 5).

Social Safety Net
One of the major benefits to the poor of an improved rural road is their ability to better access state services, in particular health facilities and personnel. In all study sites, key informant discussions revealed that this was one of the most regularly cited positive impacts. Enabling travel to a health center or hospital is one of the most important uses of the road for the poor. Isolation and remoteness contribute to the perception of poverty among rural people. This perception is reduced with the assurance that it is possible in an emergency to easily reach health facilities and that the road is passable at any time of the year. In comparing the medical services used by survey respondents in the control and project areas, control households were twice as likely to use a traditional healer. Project households clearly made better use of medical facilities through the road. Of control households, 14% stayed at home in response to poor health or a health emergency, against 7% of project households. For basic needs, 53% of control households accessed a hospital or dispensary against 76% of project households. All socioeconomic groups appeared to access health services broadly in equal measure. In traveling for treatment, over 50% of control households walked in comparison with 32% of project households, and the latter were much more likely to use either a bicycle, 3-wheeler, or van than were control households. Among the very poor, 50% overall still walked to access medical treatment, against 42% of the poor and 21% of the better off. Answers to the question of how travel to health services changed over the previous 5 years in the project sites since the improvement of the road are shown in Figure 6. Previously, people would either walk or have no easy access to such services.

Improved Services
As well as enabling the poor and very poor to access medical facilities, a road also helps teachers and medical staff working in remote locations to carry out their jobs more effectively (recall Box 3). The situation in both study locations in Indonesia demonstrates this clearly. The improved asphalt roads in Bengkulu and Yogyakarta ensured all-season access for teachers to the village (Box 11). Better roads shortened their travel times, and the wider variety of available transport services meant that they could stay longer at school. Extension officers also could achieve more of their work targets (Box 12). They were able to cover their areas of responsibility much more quickly and efficiently, and so deliver more regular and reliable service. Officials reported higher motivation to do their jobs, and some were able to take up secondary occupations to supplement their incomes because of the time saving through better transport. Education and health officials in Sorsogon reported that it was easier to monitor the provision of services in the field with better roads and the use of motorcycles or public transport.

Furthering the Reach of the State
Improved rural roads create the conditions for better access of people to services, and of services to the village. They also facilitate the reach of the state into new areas. At the Matara project site, villagers remarked how, prior to the road rehabilitation, the traditional authority of the village head extended into all aspects of village life. He would arbitrate in disputes over land issues, for example, and would resolve matters of crime that arose in the community. Since road rehabilitation, police from the vicinity can visit the community more regularly. Villagers now have access to a more
Mr. L is a teacher who has lived in the village with his family for about 15 years. He also farms for a secondary income. He says that the farm road has no impact on his job as a teacher, as he does not use it to go to school. But this road does have an impact on his secondary job as a farmer. Before the farm road was built, he was too tired to go to his plantation in the afternoon after school. Normally, he went to the farm once a week, on Sundays. Farming was not done well, crop production was very low, and he earned minimal additional income. Mr. L’s job as a teacher is helped by the main road, which passes the village. Before the road was asphalted, it was time consuming to go to and from school. He had to walk about 5 kilometers from his residence to school along the very bad road because there was no public transport. The few pickups and trucks that used the road did not serve passengers for short trips. They served only those who went to and from Bengkulu.

It took Mr. L 90 minutes going to school and 90 minutes coming back every day. School begins at 7:30 a.m. and closes at 1 p.m., so that he left his home at 6 a.m. and came back at 1:15 p.m. He goes to school 6 days a week in both dry season and rainy season. In the rainy season, he often did not go to school 3 days a week, and sometimes because of heavy rains he would not go to school for a whole week. The head of the school and other teachers knew of the conditions in his area and understood his constraints.

Since the farm road was built in 1994, Mr. L has gone to his farm every day after school. His wife and his oldest son go there in the mornings. They have planted coffee trees, and dryland paddy between lines of coffee. Mr. L’s income as a farmer is higher than his income as a teacher. As a teacher, he has gained a significant benefit from the main road. Since the road was asphalted, he has had no problem in going to school. He does not have to walk to and from school; he uses public transportation every day. Many pickups from the village go to and from Bengkulu. It takes only 15 minutes one way to the school. Every day, Mr. L leaves his house at 7:15 a.m. and arrives home at 1:15 p.m. He goes to school 6 days a week in both dry season and rainy season. He pays Rp2,000 per day for transportation, but he has more time for his farming activities with his family. He thinks he teaches better than before the road was asphalted.

Mr. M is a Javanese who lives in Penago-2 village with his family. He is an agricultural extension service worker who covers four villages in Talo Subdistrict, including Talang Kabu Village. His work area is very extensive, because most of the families in the villages are farmers.

Before the farm road was built, it was very difficult for Mr. M to visit farmers in the rice fields or plantations, and he had to walk far from his home to the fields. The farms of the four villages are divided into 20 dispersed areas. Generally, he could visit each area once only every 2 months in the dry season. In the rainy season, he did not visit any for about 4 months; instead he met them at their settlements in subvillages that were more easily accessible. Others he could not visit at all. He was able to achieve only 40% of his annual target, and the farmers did not get adequate information on agricultural technology. When the farm road was built but the asphalt road was not, the extension services were done through groups in each subvillage, but the problems of the farmers were not adequately solved. Hence, agricultural production remained low, because the farmers did not apply inputs, e.g., fertilizer or pesticide. The villages had a very limited supply of these inputs, and their prices were very high (150% of the regular price) because of transportation costs. The extension service officer often did not attend important meetings at the subdistrict and district levels because of the transportation problem.

After farm roads were built by the Tree Crop Smallholder Sector Project in Talang Kabu and Penago villages, Mr. M could do his job better. It is very easy for him to visit farmers in the rice fields, plantations, and/or their settlements. He goes to one or two locations per day by motorcycle, so he visits each of the 20 areas twice a month in both the dry and rainy seasons. In terms of his annual program, he has met more than 90% of his target, so that the farmers are getting the information they need about agricultural technology, networking, and marketing. Since 1997, when the main road was built, the farmers have been able to access agricultural input supplies from Bengkulu. They implement agricultural technology based on the technical guidance from the extension service, and apply fertilizers, pesticides, etc. Production has increased, and they sell their crops at a better price in Bengkulu and/or other markets outside the village.

The farm road and main road have given Mr. M benefits. Both roads help him carry out his annual program. He can serve the farmers more easily in the field and/or in their settlements, and he can manage his time for attending important meetings at the subdistrict and district levels.
neutral arbiter and consider that they have some protection under the law, as these matters are now outside the sphere of everyday village relations. In the Sorsogon project site, a number of key informants commented on the relationship between extending and improving the road network and tackling the issue of insurgency in the area. Better roads mean that remote locations are no longer so isolated and vulnerable, and the army has much better mobility in accessing interior areas. Better rural roads promote the spread of information and ideas, seen by the authorities as crucial in countering any ideological hold the insurgents may have over more isolated communities. Roads bring regular contact with the outside world and bring remote areas within the purview of the state and other networks.

**Broadening Opportunities**
A major benefit shared across socioeconomic groups was the greater availability of time, resulting from better access and improved transportation. Obviously, those in the community who traveled most frequently benefited most from this. But for the very poor, too, improved access even locally could mean significant time savings, and thus time to engage in other productive activities (recall Box 6). The road also broadens opportunities and choice. There are more services and facilities now available. The road is an important enabling condition in the decision about whether or not to develop a small business. Small and micro-businesses are an important means of income creation and enhancement for the poor, provided that they have some initial capital. Examples of small businesses along the roadside included the vending of fish, vegetables, and cooked foods; stores selling small quantities of household items such as soap, candies, salt, and rice; and small manufacturing and repair concerns, like bicycle repair stalls. The road, together with other enabling conditions, offers better opportunities for broadening and diversifying livelihoods.

**Exploitation**
Roads are critical social arteries for the penetration and exchange of ideas, culture, and information. This can be a positive force in exposing villagers to new and dynamic flows of information and opportunities, and increasing the desire for mobility, particularly among the young. With increased opportunities for mobility, however, there are also increased risks of exposure to negative influences from towns and cities, such as drugs and the sex trade in nearby urban centers, and sex trafficking, particularly for young, poor rural women. Provincial health officials in the Philippines identified the risks of sexual exploitation and drugs as key negative aspects arising from the development of an improved rural road network. During the PRAs in the Indonesian locations, older members of the focus groups particularly associated increased access and mobility with an influx of new ideas and practices and the erosion of older village values.

**Other Impacts**
An impact often associated with the development of rural roads is increased land prices, resulting from better accessibility between rural and urban areas. This process can often alienate the poor, whose rights to accessing land and resources may not be formal, but rather traditional and based on long years of practice. As land values increase, land ownership is formalized, and the poor are alienated from the resource base on which they have traditionally relied. In the study areas, however, there was little evidence of such a shift in access to land or of a steep increase in land prices. Neither was a high turnover in land ownership following road rehabilitation apparent. The structure of land ownership and the market for land remained much as they were before project implementation. The survey inquired about the main perceived negative effects of the road improvements. The most frequent response by far was that no negative effects (74%) had resulted. Of those negative effects observed, outside interests buying up land accounted for the second highest response (10%), followed by increased traffic accidents (5%) and traffic noise (4%).
Study Conclusions

Improved rural roads guarantee access throughout the year, so that those villagers who are able can now invest time and resources in an outside endeavor. They know that communications and links with the outside world are reasonably assured, and they can make use of a wider variety of transport services, which are more frequent, take less time to get to nearby centers, and are often cheaper than before road rehabilitation. Rural roads are, therefore, an important enabling condition for livelihood development for people in the project sites.19

Time and Energy Savings

The poor and very poor assign high priority to basic access. It reduces their vulnerability, and they consider it a matter of dignity to be able to communicate with the outside world and engage in social activities outside the village. This is confirmed by evidence from PRAs in the project and control sites. In the absence of improved opportunities to use roads, the poor rely on the primary network of paths, tracks, culverts, and basic access routes in the immediate village vicinity. Theirs is a walking world, and improvements to this primary village network of tracks, etc. that reduce the burden of basic household and productive tasks are likely to have a significant poverty reduction impact by reducing their time and energy impoverishment. In this context, the increased availability of intermediate modes of transport with larger carrying capacity to collect water, firewood, etc. is likely to have a greater initial impact on their well-being. They need to first accumulate surpluses even periodically to be able to seize new opportunities that motorized transportation may bring.

Poverty Reduction

Therefore, the study confirms that better rural roads are a necessary but not sufficient condition for graduating from poverty. There is little evidence that roads have impacted directly in terms of reducing income poverty on those groups in each study community who were identified explicitly as being very poor. The ability of the poor and very poor to make significant economic use of a road depends on their asset base and the entitlements to resources and opportunities that they can command, as well as on the passage of time. In a few instances, the poor who have invested savings in a small business or used their skills have graduated from poverty, using the benefits from the road. However, the poor and very poor benefit primarily through the indirect impacts of road improvements, of better access to state services and improved provision of services to the village, and of opportunities in alternative livelihood income streams where the preconditions for their development are right. The poor can also benefit broadly from improvements to the rural economy through increased opportunities for agricultural wage labor, but, again, these impacts are contingent on favorable preconditions being in place. The preconditions shaping the potential for development of an area can be classified broadly into two groups.

The first group consists of the external conditions around which projects must be designed. These are the macro factors, which, in the context of an investment project design, must be accepted as given. The spatial position appears to have a significant bearing on development. Remoteness is an aspect of poverty, and where communities are far from existing marketing centers, the dynamism of development is lessened considerably. Impacts appear to be of a higher order in locations closer to major centers, or where the density of population and settlement is higher, than in areas that are much more remote. Climatic conditions and the natural environment are also important; they must be able to support any potential increase in agri-

19 Those along the roads are also subject to road safety issues, though this was not prominent on case study roads.
The macroeconomic context and the prevailing terms of trade for agricultural produce are also critical to all of those area economies that are intimately linked to primary commodity production. Again, the scope for intervention of a rural road investment here is limited, except through livelihood diversification.

The second group covers structural poverty problems. These are issues of resource allocation and distribution, and prevailing social structure. The socioeconomic and cultural landscape is a critical prism through which communities are impacted by rural road investments. But again, the capacity of such investments to shape or influence this landscape is limited. The nature and distribution of land ownership constitute a fundamental determinant, but this is a political issue that ADB can hope to influence only in broad terms over a period of time and at the macro level through policy dialogue, and not over the course of a project cycle. Similarly, the social and cultural structure of communities is determined by broad historical processes and is unlikely to change immediately through rural road investments. What the investment can do is provide a vehicle for change through complementary activities that broaden opportunities for the poor and, at the same time, challenge some of the ingrained structural perceptions that otherwise restrict opportunities. An example of this is the direct employment of single, female household heads in rural road rehabilitation work. In most countries, they are one of the poorest groups, and employment on a road can improve income, broaden choice, and enhance self-esteem and confidence. Although rural road projects cannot directly challenge the structure of land ownership, they can, given the right complementary activities, broaden livelihood opportunities outside agriculture for the landless poor. This, in turn, can help the poor escape from chronic debt cycles, and so escape from poverty.

The case studies selected in each country were either sector road investments or integrated projects. The impact of improved transport services that enhanced competition and reduced transport costs for the entire community (especially those using regular transport) appeared to be greater in the transport sector projects. Under the integrated projects, it was anticipated that the poverty reduction impact would be greater, as roads were linked to other investments that could broaden livelihood opportunities for the poor. In practice, however, this was not always the case. In Sorsogon, the parallel project activities were not effectively integrated: investments in roads were made in one area, and in tree nurseries and irrigation works in others. There is some evidence that the integrated projects in Indonesia and Sri Lanka were more successful than that in the Philippines in improving livelihoods for the poor, as the roads covered in those projects were basic gravel roads, of which the poor can make more use in accessing local services and destinations. However, the projects were not sufficiently focused on the livelihoods of the poor. The Bengkulu project had a minimum land-holding requirement for farmers to be able to take part, and they had to have sufficient land and reserves of family labor in order to qualify. In Kurunegala, the irrigation tank rehabilitation work favored landholding farmers directly, with benefits assumed to trickle down to the poor in the form of increased wage-labor opportunities.

**Project Design**

Poverty reduction was not an explicit and primary objective in the design of most of these projects, a point frequently made during fieldwork by local executing agency staff. They requested that project design in the future be much more explicit about the objective of poverty reduction and that appropriate measures be included as the means of achieving this. More pro-poor investments in the future require genuinely integrated project components that offer the poor, too, some opportunity to diversify and broaden livelihoods, and thus strengthen the accumulation of capital with which to make use of improved rural roads. For this, linkages with complementary activities and services, which support the broadening of livelihood opportunities for the poor, are needed. Simply improving a road is not enough; the poor also require support in being able to make use of it.

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20 Some anticipated impacts were diminished by shocks such as droughts and adverse world market prices.

21 These criteria were introduced by the executing agencies to ensure the viability of newly established plantations and to ensure high-aggregate rubber yields.
Recommendations for Strengthening Poverty Reduction Impacts

MEASURES DIRECTLY RELATED TO TRANSPORT

Broadening Access
All of the case study locations demonstrated, to a greater or lesser degree, a high level of road density. Given the density of existing rural road networks in the study locations, perhaps there is a need now also to look at how to make better use of existing roads and infrastructure. This could mean designing interventions that concentrate on removing the access and mobility constraints on the poor, specifically making investments in tracks, paths, culverts, and crossings, as well as improving transport modalities and their carrying capacity, especially intermediate (nonmotorized) means of transport that benefit the poor.

Periodic Maintenance
Long-term social and economic benefits from roads are often threatened by neglect of periodic maintenance. Rural roads, particularly gravel roads, quickly deteriorate if not regularly maintained, and benefits can be quickly lost if the roads are periodically impassable or the overall condition is bad. The poor are generally risk-averse and will not engage in a new activity if they know that the road on which it depends will be temporarily unusable or if its poorer condition in the following year will mean that costs and time will increase. Devolving responsibility for road maintenance to local communities, particularly for basic rural roads, is a means of ensuring simultaneously that the poor can receive benefits through direct employment and that local communities are stakeholders in the road serving their area. This can be a powerful means of ensuring long-term sustainability, if supported by local ownership and the technical expertise of local authorities. The income generated from employment on the road can also provide start-up capital for the poor to make use of the road in some future enterprise or endeavor.

Regulatory Environment and Affordable Transport
The role of governments is critical in two ways. First, governments have a crucial role to play in facilitating a suitable regulatory environment for the development of competition in the transport sector. If the preconditions for the development of competition are not present, governments may need to provide transport services as a public service obligation. However, if the provision of roads has been coupled with incentives for livelihood enhancement, the poor may be able to diversify income through selling craftwork or cash crops, or providing labor in nearby markets. The state transport services could then be removed as income from these activities gives rise to sustainable private transport services.

Criteria for Road Location and Type
Often, the decisions about what roads are selected for a project are not transparent. Participation is a key element in the selection of roads to be rehabilitated or reconstructed under a rural road program, not only to decide which roads need improvement but also to understand the type of road and ancillary investments that are needed. If poverty reduction is to be a serious consideration, then criteria for road selection should include a poverty component. This can be a weighting by poverty population within the zone of influence of a road, in combination with other conventional criteria such as vehicular traffic and population density. The roads serving poverty areas could be upgraded only to a standard that is needed to connect them to the main road network.

Labor-Based Technology
Rural roads are an enabling condition for poverty reduction, and a very necessary one. Direct benefits of roads alone do not come very readily to the poor. One very important way in which they do come, however, is through direct employment of the poor in labor-based road construction and maintenance. Experience from Asia and Africa shows that, given a sufficiently long period of employment on the road, the poor can accumulate capital to invest in alternative livelihood opportunities and thus move away from poverty.

Long-term benefits from roads are threatened by neglect of periodic maintenance.
MEASURES NOT DIRECTLY RELATED TO TRANSPORT

Integrated Projects
Experience from the case studies shows that rural roads alone are not enough in tackling poverty. The poor face fundamental deficiencies in their assets to take advantage of better opportunities that a rural road may bring and, therefore, need support to capitalize. This suggests that integrated projects are needed to tackle poverty effectively. The case studies covered both sector road investments and integrated investments where the road was one part of a larger program of support. In practice, the integrated projects were either not truly integrated, or were focused largely on benefiting better-off farmer groups. The poor require genuinely integrated programs of support right through the cycles of production, transportation, and sale. Diversification into alternative livelihood opportunities will also cushion them against the impact of adverse movements in commodity prices.

Promoting Understanding
Another key role that governments have to play is fostering an understanding of the priority of poverty reduction, and disseminating this understanding to lower levels of government and to implementing agencies. Where a commitment to explicit poverty reduction objectives is missing at local implementation levels, the poverty impact can be missed completely. Governments’ institutional understanding of, and commitment to, poverty reduction must be equal to that of external funding agencies, and shared objectives should be agreed upon toward the common end of poverty reduction and addressing related structural barriers.

Participatory Design and Planning
An integrated program needs a proper period of mobilization and preparation in order to be effective and sustainable. Mechanisms should be institutionalized to ensure that the poor themselves are involved in many aspects of the investment design (but not engineering design), implementation, and operation and maintenance. Including the poor in identifying livelihood opportunities would ensure that programs are relevant to their needs and skills, that they are the principal beneficiaries, and that the benefits are sustainable.

Poverty Assessment
If poverty reduction is an objective, a proper analysis at the project design stage is necessary of who the poor are and on what factors their livelihood strategies depend. This requires a stakeholder analysis and poverty benchmarking to establish a baseline against which project impacts can be measured in the future. Experience from the study shows that significant social benefits accrue to the poor from rural road investments, particularly in accessing outside services. These are inherently unquantifiable, but can be assessed qualitatively if effective, structured baseline research is done at inception.

Project Performance Monitoring
Regular monitoring and evaluation of livelihood impacts against this baseline should be carried out through a clearly defined project performance monitoring system. This will ensure that, in the future, impacts on the poor are captured, rather than assumed. Project performance monitoring and evaluation systems were part of the ADB design of most of the case studies covered by this evaluation, but were exclusively the responsibility of the executing agencies, which were often expected to meet the costs from counterpart funding. In a situation of scarcity of local resources, such systems were often abandoned, or allowed to lapse for so long that information that was eventually collected was largely useless. Monitoring indicators were also usually progress indicators, measuring fund disbursement and physical works, and were not

Stakeholders need to be involved early on if poverty reduction is an explicit objective of road investment.

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25 Experience from the project site in Bengkulu, Indonesia shows that the formation of farmers’ groups and cooperatives is not in itself enough. The groups must go beyond simply producing a particular commodity or crop and should be able to undertake credit and marketing and also to access affordable transportation.

26 Often, impacts on the villagers and particularly the poor and very poor take a long time to materialize and need to be monitored periodically to evaluate progress.
complemented by impact indicators for identifying exactly what the outcome of works had been, particularly on the poor.

**Partners**
How best to implement rural roads with integrated livelihood support components is a difficult question. Funding agencies may require borrowers to take on partners with a proven track record in aspects of the program design, such as bilateral agencies, or local or international nongovernment organizations that have good experience in mobilizing and working closely with communities. It should be recognized that complex, integrated programs may require a number of partners, and external funding agencies can play a key role in helping executing agencies manage and coordinate this process effectively.
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APPENDIX 1

Methodology

Study Direction Determined at Methodology Workshop

Chapter I gives a brief description of the methodology used for the study including methodological assumptions, case study selection, and study tools used to validate and attribute impacts. This appendix gives further details that steered the study methodology, including the criteria for selecting the projects and study areas, and the effectiveness of various study tools used. Following a literature review and a review of documents, the study team developed a preliminary approach, which included a list of suggested instruments, definitions to be used, and possible key indicators. During a methodology workshop, the participants’ inputs clarified the direction the study should take, determining the following key points:

- The study was to focus primarily on rural road investments undertaken in the recent past, either as a transport sector investment or as a component of an agriculture sector integrated project.
- Given time and financial resource limitations, a case study approach was to be adopted to capture a deeper understanding of a variety of scenarios rather than selecting a proportionately representative sample from each project.
- The study would try to maximize the learning experience by exploring the factors that drive impacts rather than measuring the magnitude of impacts, relying on the double difference technique.¹
- The study would consciously focus on poor areas to ensure that impacts on the poor's livelihoods could be captured.
- Based on the limited information available in a retrospective study, a variety of tools would be used sequentially, with each intended as an input for the next, and all geared to support and validate the findings.

Methodological Assumptions

Multifaceted Impacts

Instead of assuming an automatic link between constructing rural roads and poverty reduction, the study methodology gave due consideration to the intervening sociocultural, economic, environmental, and institutional factors that determine how people respond to a road and that shape livelihood constraints and opportunities. This meant that relying primarily on classical road assessment tools such as traffic movements, vehicle operating costs (VOCs), and freight and passenger prices to assess impacts would not be sufficient. These tools are also not readily applicable to rural roads,² where traffic volumes and services are often extremely low. Rural roads can also be social and economic arteries for communities in a broader sense, with a myriad of localized impacts not readily accessible to analysis using traditional means. These may include the ability to make periodic social visits, a broadening of choices about where and whether to sell surplus agricultural produce, migration for seasonal work, access to health services, and greater readiness of professionals (such as doctors, teachers, etc.) to work in remote areas. Negative impacts could include greater openness to outside interests to exploit natural resources. To understand these multifaceted processes, deeper qualitative understanding and closer interaction with the villagers were needed. This was the primary basis for using a case study approach.

Multidimensional Poverty

The study assumed that poverty is a multidimensional condition, and that lack of income (“income poverty”) is only one component. This is a central tenet of the poverty reduction strategy of the Asian Development Bank (ADB), which states that “poverty is a deprivation of essential assets and opportunities to which every human is entitled.”³ The study adopted an assets-based approach to defining and understanding poverty in line with recent comprehensive work done on poverty and transport.⁴ The study built on this work to apply and adapt some of the principles and approaches in the context of road investments in Asia. Key elements of conceptualizing poverty holistically include

- lack of income, and low level of consumption;
- lack of private and social assets (human, social, natural, physical, financial);

¹The double difference technique is a tool that uses the differences in impacts before and after an intervention and also between a project site and a control site (with and without project) to attribute impacts of the intervention.
²Different countries have varying classifications for roads depending on technical specifications, sources of funding, and the importance of the points they connect. To facilitate comparisons, rural roads are defined here simply as roads through rural areas.
voicelessness, lack of dignity, and inability to participate;
- insecurity and vulnerability to risk and to shocks; and
- inability to influence institutions and processes at the macro or micro levels.\(^5\)

**Direct and Indirect Impacts**
The study considered direct impacts to be wholly attributable to the road improvement and its use. They could be either positive (reduction in VOCs) or negative (increased road accidents). Indirect impacts are those that occur after a passage of time as a result of direct impacts. They, too, can be positive (reduction in agricultural input prices) or negative (spread of diseases).

**Road Infrastructure and Transport Services**
The study assumed that rural roads are a necessary but not sufficient condition for provision of rural transport services. This relationship was a critical area of inquiry. In remote locations where transport demand is low, there may be few incentives for private transport operators to develop services to rural communities, even where infrastructure is adequate.

**Access and Mobility**
The study adopted a broad focus on “access.” Both physical and nonphysical barriers to access were investigated. Improving transport for the poor requires both the provision of infrastructure and services and the consideration of the key socioeconomic parameters that may condition people’s ability to make use of wider transport opportunities. Mobility refers to the ability to travel regularly outside the community in search of work or other opportunities. Mobility is increasingly important, particularly as the importance of agriculture fluctuates in the face of changes to global terms of trade for primary products, and opportunities for migration and commuting increase.

**Gender and Transportation**
In understanding impacts, a gender perspective is critical, because women and men have different productive and household responsibilities and, therefore, different transport needs. Women are more likely to lack access to means of transport or income for travel, but may have a heavy transport burden in meeting productive tasks, household needs, and community obligations. They are therefore more likely to be time and energy impoverished.\(^6\) Women also face significant nonphysical barriers to access due to cultural restrictions. Extreme poverty can also increase women’s vulnerability to exploitation through trafficking and the commercial sex trade.

**Study Tools**
All research activities were intended to be mutually reinforcing components of the methodology to ensure its robustness in attributing the impacts of rural roads on poverty reduction.\(^7\) The following tools were used sequentially, with each intended as an input to the use of the next.

**Key Impact Indicators and Baseline Data**
Domestic consultants recruited in each country worked according to an agreed upon methodology. An important early task in each country was the collection of key data indicators of socioeconomic development and agricultural production in the study areas across the lifetime of the project (usually the previous 10 years). The consultants were also tasked with collecting all available data from the project locally and from existing ADB documentation. Both these sources were expected to provide the study with baseline data on trends against which to evaluate emerging impacts. Both of these sources proved difficult to collect in all study locations.

Although many of the projects studied were supposed to have a monitoring and evaluation component, for beneficiaries particularly, this component was seldom implemented in practice. Any monitoring and evaluation done was often restricted to project physical progress, in terms of completion of works, rather than the actual impact that the project had had. This lack of baseline information restricted the ability of the study team to assess project impacts over time.\(^8\) Where some form of data had been collected, it was not kept or used by implementing agencies, particularly once the ADB loan had been disbursed, and so was not available to the study team.

A list of key data indicators was also developed for collection in each location. These data were intended to establish broad background trends within which project impacts could be located. However, the team perhaps overestimated the degree to which these data would be available, as in practice they proved difficult and time consuming to collect. Many of the data indicators were simply not collected regularly and monitored by provincial or district authorities. Consequently, this component of the methodology was only partly completed.

**Key Informant Interviews**
Semistructured interviews with key informants at the national, provincial, and local levels provided background in-

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\(^7\) The study teams were resident in or near each of the case study areas for a period of 2 weeks during February–April 2002 and had the opportunity to collect detailed information from all types of project stakeholders.

\(^8\) This seriously affected the quantification of benefits in an economic sense, as recall techniques could not be reliably used to quantify the status of village activities prior to construction of the road.
formation and perceptions about the impact of roads. These interviews proved to be very useful, given the time constraints of the study. Key informant interviews were an important complementary activity to the village- and community-level participatory assessment activities in informing researchers of wider dimensions not necessarily apparent to the poor themselves. The research team, prior to the start of the interviews, developed preliminary guide questions to partly structure the interview. Often, these interviews enabled the study team to disaggregate groups in the study area, particularly to identify subgroups of the poor. They also helped develop an outline for stakeholder analysis that could be further adapted by subsequent participatory research activities.

Depending on the knowledge level of the interviewee, it was also possible to gather explanatory information not available from secondary data. Mid-level provincial administrative informants and technical informants helped in site selection and provided historical information on the selected sites concerning conditions prior to road improvement. The technical officers who worked on a particular project and at the local level were naturally able to provide more detailed and accurate information on the project site. The local-level interviews were particularly helpful in selecting the control sites and identifying poor groups within them. Types of persons interviewed were

- project management officers at the national level;
- project management officers at the provincial level;
- other provincial-level key informants in agriculture, transport, health, social services, and infrastructure;
- project management units at the district level relevant to case study areas;
- extension services staff;
- village-level key informants: village leaders, community-based organization and self-help group representatives, schoolteachers, shopkeepers, transport operators, and traders within and outside the village;
- those who had graduated from poverty since project intervention (all available households were interviewed); and
- those who remained poor despite project intervention (a sample of households were interviewed).

**Participatory Assessment**

Structured participatory rural assessment (PRA) techniques conducted by trained researchers were important in actively engaging the local communities (and particularly the poor) in the study. PRA techniques were used primarily to increase understanding both of the issues facing the poorer segments of the study communities and of the impact of rural roads on their livelihood patterns and quality of life. A range of PRA methods was used in the different locations based on suitability for the particular location, on the group of individuals, and on priority issues under discussion. The methods used included

- village transects (physical inspection of resources, houses, roads, topography);
- social maps (mapping poor houses, nonpoor houses, roads, schools, health centers, other public facilities);
- resource maps (agricultural field processing centers, water sources, forests);
- income resources analyses (sources of income, roles of men and women, marketing, other related issues);
- social networks (relationships and networks, community-based organizations);
- analysis of problem ranking (identification of common problems of men and women separately and ranking them as a group);
- seasonal calendars (how seasons affect way of life, especially regarding use of the road);
- classification of village groups and definition of each; and
- poverty analyses, trends and attribution analyses, own perceptions, and community poverty.

A wealth of information was generated through these exercises, which was critical in gaining a greater understanding of the importance of roads and connectivity to different groups within the village. This information was transferred to the framework for comparison and analysis. The familiarity gained through these exercises also helped the enumerators to subsequently administer the household surveys. While the study team gained a greater understanding of the issues, the villagers got the chance to learn about the study and its objectives. The study team provided as much information as possible, especially regarding the objectives of the study, in an attempt to overcome the recurring perception of the villagers that a feasibility study for road construction was being carried out. In most cases, the villagers accepted the study design and orientation. Being in close contact with the study team for a length of time facilitated this understanding among the villagers to a great extent.

**Traffic Analysis**

Traffic analysis was carried out by a trained team who assessed the volume of traffic, its mix, usage of different modes of transport by the population, ownership of vehicles, and role of vehicle operators. Vehicle traffic counts were generally undertaken on a normal day and a market day in study locations (see Table A1.1). These data were intended for comparison with existing project records of traffic before, during, and after implementation, but this information was usually not available. Nevertheless, the information generated was useful in informing the study team

9 Most of the household case studies are the result of key informant interviews.

10 See a sample framework in Appendix 4.
of the volume and mix of traffic in each location. The study team carried out the following surveys:

- cordon survey (traffic counts on market and nonmarket days for motorized and nonmotorized movements) to assess the types and volumes of people and goods using the roads;
- passenger and freight survey (on moving vehicles) to gauge purpose of travel, time expended, value of goods transported, and transport prices; and
- interviews with vehicle operators to understand impacts on VOCs, frequencies, and travel time.

### Household Surveys

The household survey was used in common (as far as this was possible) across all three countries to enable cross-country comparisons and the identification of key trends and impacts. It was collected in both project and control communities. In terms of time and effort, this occupied a major part of the fieldwork. The questionnaires were pilot tested in Sorsogon, Philippines and subsequently changed slightly to adapt to differences in the context of each study area. Data were collected from about 80 households in each study area (40 in the project site and 40 in the control site). The enumerators all spoke the local dialect and generally interviewed the respondents in their homes, enabling sufficient time to capture information through structured questions as well as open-ended ones. The total number of households surveyed and the gender distribution of the household heads are given in Table A1.2. The survey data were coded and digitized in the field to check for their validity and any errors, and were analyzed subsequently on return to each country base.

### Workshops

Country feedback and discussion sessions were held in one location in each country following the completion of the draft country report. The preliminary findings were discussed with implementing authorities, local officials, and community representatives, allowing the team to validate its findings. A workshop held at ADB also enabled the dissemination of preliminary findings and discussion of emerging issues and recommendations.

### Framework and Triangulation of Information

This variety of methodological tools was used to ensure effective cross-checking and validation through the triangulation of findings. In the field, the means of documenting information from PRA and key informants was the reporting framework. It developed as a common means of analysis in each country.12 Findings from the qualitative research activities were fed into this framework by the study team and used in writing up country case study reports. The framework adopted an assets-based conceptual approach to poverty, and was intended to capture information at a number of different levels including the “process” and dynamism associated with changes arising from the road project. In conceptualizing poverty through individual and community

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11 In some areas, the low density of population in the control site did not allow for 40 household surveys.

12 Sample framework in Appendix 4.
assets, the framework also analyzed the institutions and processes that determined opportunities and constraints for the poor; the operation of government at different levels (local, regional, national); the private sector; nongovernment organizations and community-based organizations; traditional institutions and authorities; and the role of prevailing social norms, laws, and regulations in shaping the institutional and governance context. The framework proved to be particularly helpful in documenting the participatory and qualitative research activities. The qualitative information from the framework was combined with household and traffic surveys on the one hand and key impact indicators and secondary data on the other to cross-check and validate, thus improving the robustness of the data. This triangulation of information is depicted in Figure A1.1.

**Attribution of Impacts**

Given the absence of useful baseline information, it was difficult to use the double difference technique quantitatively. Instead, recall techniques were used to compare before and after conditions in a qualitative sense. Even the recall techniques proved to be quite difficult to use in areas where the road appeared not to be an important determinant in the villagers’ routine struggles. Therefore, even a modified double difference technique was ineffective, making rigorous attribution of impacts impossible. Instead, the control areas were used to understand the difficulties the poor face without accessibility to the outside and the extent to which easing these constraints fits in with their poverty status.

**Project Selection Criteria**

It was important that, in the case studies selected, sufficient time had elapsed since the physical completion of the rural road. Impacts that may occur through changes in economic activities, increased accessibility, enhanced communication, etc. take time to develop subsequent to the opening up of a rural community. If too much time has elapsed, it is more difficult to discern the impact of other major interventions from those of the rural road. Therefore, a careful balance was needed in terms of the time frame for selecting case study projects. Case study projects selected had to have been physically completed a year or more before the fieldwork. Therefore, projects approved mostly in the 1990s that satisfied the other criteria were selected for a first review. To be cost effective in terms of time and resources spent, three countries with two projects in each were selected: Indonesia, Philippines, and Sri Lanka. This was influenced by the decision not to duplicate other ongoing efforts but to complement them. In each country, a rural road component under a transport sector project plus an integrated rural development project (in the agriculture sector) with a rural road component were selected with the intention of comparing the impacts of road investments on their own as well as those part of a wider program.

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**Table A1.2: Gender Distribution of Household Heads in the Survey Locations**

<table>
<thead>
<tr>
<th>Location</th>
<th>Gender of Household Head</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
</tr>
<tr>
<td>Indonesia:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bengkulu:</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>Control Site</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>Yogyakarta:</td>
<td>34</td>
<td>6</td>
</tr>
<tr>
<td>Project Site</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>Control Site</td>
<td>38</td>
<td>2</td>
</tr>
<tr>
<td>Philippines:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sorsogon:</td>
<td>29</td>
<td>2</td>
</tr>
<tr>
<td>Project Site</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>Control Site</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>Negros:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Site</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>Control Site</td>
<td>38</td>
<td>1</td>
</tr>
<tr>
<td>Sri Lanka:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kurunegala:</td>
<td>35</td>
<td>5</td>
</tr>
<tr>
<td>Project Site</td>
<td>28</td>
<td>1</td>
</tr>
<tr>
<td>Control Site</td>
<td>35</td>
<td>4</td>
</tr>
<tr>
<td>Matara:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project Site</td>
<td>35</td>
<td>6</td>
</tr>
<tr>
<td>Control Site</td>
<td>35</td>
<td>6</td>
</tr>
<tr>
<td>Total</td>
<td>424</td>
<td>33</td>
</tr>
<tr>
<td>Percentage</td>
<td>93</td>
<td>7</td>
</tr>
</tbody>
</table>

Source: Household survey data.
Study Area Selection Criteria

Given the limited time available for the study and the extensive geographic scope of ADB operations, it was clearly important that the selected fieldwork sites be both representative of the prevailing conditions in rural Asia and broadly representative of the access conditions and restraints faced by its rural people. One of the projects selected in each country was a sector-based road investment, and the other an integrated rural development project with a rural roads component. In selecting these different kinds of projects, it was intended that the impact of road investments on their own could be compared with rural roads as part of a wider program.

Cumulatively, the six field sites selected across the three countries covered a broad range of both the physical and nonphysical factors likely to condition the context for rural road interventions across ADB operations in Asia. But road projects, by their linear nature, can cover long distances, and the likelihood of changes in physical, environmental, and social conditions is, therefore, increased even within one project, making uniformly representative site selection difficult. Besides, each country, region, and specific area has characteristics particular only to that location, and the case studies would capture these contextual scenarios, which would flavor the findings.

Prior to the start of fieldwork, the domestic consultants visited possible project locations to establish preliminary contacts and collect baseline data as well as key impact indicators. They also inspected a few road segments based on the road selection criteria. The road area selected had to be

- representative of the prevailing poverty conditions faced by rural people in the project area,
- broadly representative of the access conditions and restraints faced by rural people,
- a reasonably long segment (about 10 kilometers) to have an impact on the level of economic activity, and
- near another community in the vicinity that could act as a control area.

The selection of a focus study road link was done in consultation with local staff, village leaders, and officials responsible for implementation of the projects. They had knowledge of and experience in the area and its poorer parts, and were best placed to identify a road section suitable for the study’s purposes. Some local authorities later became key informants. It is important to emphasize that road segments in poor districts were purposely selected during this process, and that conclusions from the study locations are, therefore, not necessarily applicable across all sites covered by the projects. In keeping with the poverty focus of the study, locations were selected where the density of poverty was known or assumed to be high. A focus community (project site) was selected from along the road link where research activities were concentrated. The same criteria for selection of both roads and study communities were used in all countries to ensure cross-country comparisons.

Practical Difficulties Encountered During the Study

Data

A common difficulty across all case study projects was the lack of baseline data. Monitoring and evaluation components built into project design were often limited to assessing physical completion rather than capturing impacts on beneficiaries. This restricted the assessment of impacts and their quantification in an economic sense. Recall techniques were not sufficiently reliable in quantifying the economic status of village activities prior to the construction of the road. The contribution of key data indicators was overestimated, and many indicators were simply not collected regularly nor monitored by provincial- or district-level authorities. Consequently, this component of the methodology was only partly completed.

Control Sites

Finding good control areas for comparison of project and nonproject cases proved difficult to varying degrees. In practice, very few locations could be described as completely lacking any form of road access. Hence, the study team was forced to identify control sites as being at least 45 minutes travel time away from the nearest available form of public transport, rather than lacking completely any form of road access. In Yogyakarta, the study team adopted other access constraints to define the suitability of a control site. In Kurunegala, the sites did not have sufficient population, so the study team adopted a full census of the control area or used more than one control site. Much effort was also spent on finding areas that were similar (especially in terms of agricultural potential) in most ways to the project site study area, except for the lack of a road. As such, the selected areas proved to be suitable as control sites with minimum selection bias and, hence, did not compromise the quality of the findings.

Locational Difficulties

In most locations, the participation of local officials was excellent, which was a key factor in the successful implementation of the study. However, in some instances, there was

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13 The People’s Republic of China, India, and Thailand were being studied under an ongoing technical assistance activity on Assessing the Impact of Transport and Energy Infrastructure on Poverty Reduction, which was a broader study but nevertheless covered rural road projects. A similar impact evaluation of Bangladesh rural roads was being done simultaneously under the Road Network Improvement and Maintenance Project Feasibility Study. Fieldwork in Pakistan was not possible at the time due to security concerns, and work in the Pacific islands was deemed too expensive. Otherwise appropriate projects in the Mekong region were ongoing and too recent for discerning impacts. Nepal, due to its difficult geographic terrain, was considered to be not very representative of the rest of the Asian landscape.
variation in the interest of these officials, the result of concern with local elections, staff transfers, and the length of time that had elapsed since project implementation. In the Philippines, the law and order situation in the study sites imposed a considerable constraint on the study team’s activities there. Enumerators could not freely observe the household conditions of the respondents in one location. In other sites, there were various logistical problems (power failures, lack of accommodation, etc.). Nevertheless, the quality of the data collected was very good due to the dedication of the study team, who spent long hours under trying conditions in the field during the day and many hours discussing, validating, and recording findings in the evenings.
APPENDIX 2

Case Study Projects and Sites

Study Projects

The objectives of the case study projects and the components that were designed to achieve these objectives are set out in Box A2.

<table>
<thead>
<tr>
<th>Project Objectives and Data</th>
<th>Road Components</th>
<th>Other Components</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tree Crop Smallholder Sector Project (TCSSP)—Indonesia (INO)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To reduce poverty by improving the income and employment prospects of rubber and tea smallholders and landless rubber tappers, of whom over 50% lived below the poverty line</td>
<td>Construction of plantation roads</td>
<td>Plantation establishment and maintenance</td>
</tr>
<tr>
<td><strong>Approval:</strong> 1991  <strong>Amount:</strong> $135 million  <strong>Completion:</strong> 2000; study (farm) road constructed in 1993, district road asphalted in 1996</td>
<td></td>
<td>Support services including project management</td>
</tr>
<tr>
<td><strong>Study Area:</strong> Bengkulu</td>
<td></td>
<td>Equipment, training, and consulting services</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Third Local Roads Project (TLRP)—INO</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To improve the road network in selected provinces and support periodic maintenance</td>
<td>Rehabilitation of paved and unpaved roads</td>
<td></td>
</tr>
<tr>
<td><strong>Approval:</strong> 1993  <strong>Amount:</strong> $200 million  <strong>Completion:</strong> 1997; study road asphalted in 1997</td>
<td></td>
<td>Replacement of bridges</td>
</tr>
<tr>
<td><strong>Study Area:</strong> Yogyakarta</td>
<td></td>
<td>Periodic maintenance</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Provision of road maintenance equipment and consulting services</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Sorsogon Integrated Area Development Project (SIADP)—Philippines (PHI)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To reduce rural poverty in Sorsogon by increasing incomes, generating employment, and improving the standard of living of subsistence farmers and fisherfolk</td>
<td>Improvement and rehabilitation of 156 kilometers of national secondary</td>
<td>Rehabilitation of 15 communal irrigation schemes</td>
</tr>
<tr>
<td><strong>Approval:</strong> 1988  <strong>Amount:</strong> $24.1 million  <strong>Completion:</strong> 1997; study road rehabilitated and graveled in 1995</td>
<td></td>
<td>Provision of health and water supply facilities to control schistosomiasis; provision of plant nurseries, abaca tissue culture laboratory, and artificial reefs; and strengthening of extension services</td>
</tr>
<tr>
<td><strong>Study Area:</strong> Sorsogon</td>
<td></td>
<td>Project management support</td>
</tr>
</tbody>
</table>

*Completion indicates the year in which all project operations were completed. The study road may have been completed and rehabilitated prior to that.*
Comparison of Study Roads

From each project, a road was selected as a case study. These roads were broadly similar in that all were basic roads with seasonal and market day fluctuations in traffic volume, serving primarily localized travel patterns and travel needs. The six roads can be classified into two distinct groups:

- The three roads that were completed as part of integrated rural development projects were all gravel surfaced and located in clearly rural areas. They served primarily a farm-to-market purpose. Two of the roads (in Bengkulu, Indonesia and Kurunegala, Sri Lanka) could be considered basic access roads, as they served no strategic purpose on the localized network.
- The three asphalted road segments were all completed as part of a road sector investment program and traversed rural areas selected for the study. The volumes of traffic on these roads were higher, and there was some evidence that two of them (in Negros, Philippines and Matara, Sri Lanka) were serving as bypasses for major traffic on the road network.

All of the study road segments demonstrated, to different degrees, a mix of “traditional” nonmotorized and pedestrian traffic, and “modern” vehicular traffic. Table A2.1 summarizes the characteristics of these road segments and their transport conditions.

Comparison of Study Sites

Six project sites were selected from along the project roads. Primary research activities were focused in these communities. Six control sites (similar to the project sites) were also selected for research; these were close to the study sites, but far from a motorable road. Table A2.2 describes the similarities in each project site and its corresponding control site, and also contrasts their accessibility differences.
fore, the control sites were well suited to compare the with-
and without-project situations.

**Details of Study Roads, Project Sites, and Control Sites**

**Tree Crop Smallholder Sector Project, Indonesia**

**BENGKULU, INDONESIA: TALANG PADANG-TANAH ABANG ROAD.** The project built basic, narrow, graveled plantation roads to better access farmers’ rubber plantations and rice fields, which were newly established under the project. The project road, established in 1993, was built by a farmers’ group and initially maintained by them. However, this group stopped maintaining the road after a few years, as the members felt that the benefits received were not commensurate with their efforts. Their decision also coincided with a decline in intercropping as the rubber trees matured. The plantation roads then reverted to basic access tracks. To be comparable with other communities studied, the community adjacent to a plantation road and the 16-kilometer (km) asphalt road

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<table>
<thead>
<tr>
<th>Item</th>
<th>Integrated Projects</th>
<th>Transport Sector Projects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Bengkulu*</td>
<td>Yogyakarta</td>
</tr>
<tr>
<td>Country</td>
<td>Philippines</td>
<td>Philippines</td>
</tr>
<tr>
<td>Rehabilitated</td>
<td>Indonesia</td>
<td>Sri Lanka</td>
</tr>
<tr>
<td>Length (kilometers)</td>
<td>1996</td>
<td>1997</td>
</tr>
<tr>
<td>From</td>
<td>16.0</td>
<td>1996</td>
</tr>
<tr>
<td>To</td>
<td>Talang Padang</td>
<td>10.5</td>
</tr>
<tr>
<td>Bypass</td>
<td>Tanah Abang</td>
<td>Semanu</td>
</tr>
<tr>
<td>Condition</td>
<td>No</td>
<td>Giri Panggung</td>
</tr>
<tr>
<td>Increase in Transport Volume</td>
<td>Poor/good</td>
<td>No</td>
</tr>
<tr>
<td>Modes of Transport</td>
<td>Wheelbarrow, truck,</td>
<td>Asphalt</td>
</tr>
<tr>
<td></td>
<td>bus</td>
<td>Minibus</td>
</tr>
<tr>
<td>Competition in Transport</td>
<td>Not much</td>
<td>Competitive</td>
</tr>
<tr>
<td>Services</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport Price Reduction</td>
<td>Small</td>
<td>Moderate</td>
</tr>
<tr>
<td>Travel Time</td>
<td>Reduced</td>
<td>Good</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Moderate</td>
</tr>
</tbody>
</table>

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*a Since the project road was a graveled farm road with little traffic, for the purposes of the study, this and the link district road subsequently asphalted by the government were considered together.

*b Jeepneys are locally made vehicles that are like minibuses.

*c Subsidized bus was available before and after road improvement.

Source: Study team

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Bengkulu Study Road, Indonesia

Bengkulu Control Site Access, Indonesia
<table>
<thead>
<tr>
<th>Study Area/Project</th>
<th>Project Site</th>
<th>Control Site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bengkulu/TCSSP (INO)</td>
<td>Talang Kabu-Talaatan</td>
<td>Talang Padang</td>
</tr>
<tr>
<td>Main Production</td>
<td>Rubber, coffee, paddy, and fruits</td>
<td>Rubber, coffee, paddy, and fruits</td>
</tr>
<tr>
<td>Land Ownership/Employment</td>
<td>Smallholders and wage laborers</td>
<td>Smallholders and wage laborers</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Next to district road and farm road providing access to fields</td>
<td>Track across river on small suspension bridge</td>
</tr>
<tr>
<td>Facilities</td>
<td>Elementary and high school on district road</td>
<td>Elementary school in village</td>
</tr>
<tr>
<td>Total Households</td>
<td>156</td>
<td>183</td>
</tr>
<tr>
<td>Survey Respondents</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Yogyakarta/TLRP (INO)</td>
<td>Candirejo Village</td>
<td>Sumber Wungu-Kelayu</td>
</tr>
<tr>
<td>Main Production</td>
<td>Rice, cassava, groundnut, banana</td>
<td>Rice, cassava, groundnut, banana</td>
</tr>
<tr>
<td>Land Ownership/Employment</td>
<td>Smallholders and laborers</td>
<td>Smallholders and laborers</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Study road runs through site</td>
<td>6 kilometers from asphalt road; walk on rocky paths to reach site</td>
</tr>
<tr>
<td>Total Households</td>
<td>385</td>
<td>149</td>
</tr>
<tr>
<td>Survey Respondents</td>
<td>40</td>
<td>39</td>
</tr>
<tr>
<td>Sorsogon/SIADP (PHI)</td>
<td>Barangay Palale</td>
<td>Barangay Bical</td>
</tr>
<tr>
<td>Main Production</td>
<td>Coconut with little intercropping, highly dependent on copra price</td>
<td>Coconut with little intercropping, highly dependent on copra price</td>
</tr>
<tr>
<td>Land Ownership/Employment</td>
<td>Mostly tenant farmers; few landowners; others are agricultural laborers</td>
<td>Mostly tenant farmers; few landowners; others are agricultural laborers</td>
</tr>
<tr>
<td>Accessibility</td>
<td>All-year access on study road</td>
<td>Inaccessible during rainy season; takes 30-40-minute walk on track over two rivers in dry season</td>
</tr>
<tr>
<td>Facilities</td>
<td>Elementary school in the barangay</td>
<td>Elementary school in the barangay</td>
</tr>
<tr>
<td>Total Households</td>
<td>96</td>
<td>96</td>
</tr>
<tr>
<td>Survey Respondents</td>
<td>31</td>
<td>40</td>
</tr>
<tr>
<td>Negros/FRIP (PHI)</td>
<td>Barangay Magallon Cadre</td>
<td>Barangay Macagahay</td>
</tr>
<tr>
<td>Main Production</td>
<td>Sugarcane</td>
<td>Maize for subsistence; sugarcane not grown due to lack of road network</td>
</tr>
<tr>
<td>Land Ownership/Employment</td>
<td>Landless seasonal labor and absentee landowners of large plantations</td>
<td>Smallholders of land; employment opportunities scarce for landless</td>
</tr>
<tr>
<td>Accessibility</td>
<td>On project road with high volume of through traffic</td>
<td>Across footbridge on river plus 45-minute difficult walk; inaccessible during rainy season</td>
</tr>
<tr>
<td>Facilities</td>
<td>Elementary school and health center</td>
<td>Elementary school; no useful health center</td>
</tr>
<tr>
<td>Total Households</td>
<td>616</td>
<td>335</td>
</tr>
<tr>
<td>Survey Respondents</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>Kurunegala/NWP-WRDP (SRI)</td>
<td>Nugannoruwa</td>
<td>Walahinikalla and Wembuwa</td>
</tr>
<tr>
<td>Main Production</td>
<td>Paddy with some dryland cultivation</td>
<td>Paddy with some dryland cultivation</td>
</tr>
<tr>
<td>Land Ownership/Employment</td>
<td>Mostly small farmers and some wage laborers; a few large farmers</td>
<td>Small farmers</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Adjacent to study road</td>
<td>45-minute walk to bus route on tracks across fields</td>
</tr>
<tr>
<td>Facilities</td>
<td>Insufficient water for cultivation; community hall, preschool</td>
<td>Water available in village tank; have to access project site facilities</td>
</tr>
<tr>
<td>Total Households</td>
<td>118</td>
<td>39</td>
</tr>
<tr>
<td>Survey Respondents</td>
<td>40</td>
<td>29</td>
</tr>
<tr>
<td>Matara/SPRIP (SRI)</td>
<td>Heegoda</td>
<td>Makiliyathanne</td>
</tr>
<tr>
<td>Main Production</td>
<td>Tea and some spices</td>
<td>Tea and some spices</td>
</tr>
<tr>
<td>Land Ownership/Employment</td>
<td>Mostly smallholders and laborers</td>
<td>Mostly smallholders and laborers</td>
</tr>
<tr>
<td>Accessibility</td>
<td>Adjacent to study road</td>
<td>Upper slopes accessible by winding stone paths; very difficult</td>
</tr>
<tr>
<td>Facilities</td>
<td>No community organization; school on main road</td>
<td>No community organization; school on main road</td>
</tr>
<tr>
<td>Total Households</td>
<td>490</td>
<td>310</td>
</tr>
<tr>
<td>Survey Respondents</td>
<td>39</td>
<td>41</td>
</tr>
</tbody>
</table>

linking the plantation road to the main road was considered as the project site. This link road had a close connection to the project plantation roads. It was asphalted by the provincial government in 1996 in response to farmers’ requests for a better road to complement the project activities. The area is remote, and much of the travel was local. After the asphalt, regular bus and minibus services ran to Bengkulu, the provincial capital. The speed of travel and thus time saved also increased markedly after rehabilitation.

**BENGKULU STUDY AREAS.** Villagers in both the project site (Talaatan) and the control site (Talang Padang) were smallholders, and the poorer families also worked as agricultural laborers, fisherfolk, basket weavers, or forest product collectors. Crops in both sites included paddy, maize, cassava, sweet potato, groundnut, and soybean. Tree crops included rubber, coffee, coconut, jackfruit, and durian. Accessibility was very different in the two locations. Talaatan was next to the district road, and the villagers there used public transport to go to the weekly market or the provincial capital. The control site was completely inaccessible by road, as it was on an island surrounded on all sides by a river. Access was either by wading across the river or via a small suspension bridge. During the wet season, the river could swell, and wading across was not possible. The village extended to the banks on the other side, and access from there to the nearest road was along a track and then on through farmland to the road. The road was motorable during the dry season only by 4-wheel drive vehicles, the conditions were very difficult, and there were no transport operators servicing the village.

**Third Local Roads Project, Indonesia**

**YOGYAKARTA, INDONESIA: SEMANU-GIRI PANGGUNG ROAD.** The project rehabilitated 10.5 km of the 22-km stretch of this road, which runs from the municipal capital to another arterial road in the south. The road passes through agricultural lands, and the study community at Candirejo is approximately 4 km along the road. There was a higher level of motorized transport on this route compared with the other study areas, minibuses being the predominant mode. Bicycle use was very low, perhaps due to the terrain. After the rehabilitation of the road, a high frequency of transport services developed, with a consequent decrease in waiting times. Decreased traveling times were also evident.

**YOGYAKARTA STUDY AREAS.** The study areas are similar in terms of physical aspects, geography, topography, crops, and culture. Both the project site (Candirejo) and the control site (Kelayu subvillage) are situated in hilly areas, meaning that most of the available farmland is sloping. The condition of the soil is very poor, with a major portion of the land classified as unfertile. The majority of cultivated land in the area was planted to dryland rice and cassava, which was intercropped with groundnut and some banana. The rocky topography in some places made agricultural production difficult, and water was a real problem throughout the region. The villagers were a mix of smallholder farmers and farm laborers. Most of the villagers had “noncertificate” status of land ownership. The accessibility was much different between the sites. While the study road runs through the project site, the control site community is 6 km from the asphalt road. The villagers had to walk along a rocky road and pathways to reach the central village.

**Sorsogon Integrated Area Development Project, Philippines**

**SORSOGON, PHILIPPINES: BULAN-MAGALLANES ROAD.** This 21-km road segment connects the municipal centers of Bulan and Magallanes. It was rehabilitated and graveled under the project in 1995 and subsequently asphalted in places using district funds. Following the improvement in the road surface (still in good condition), there was a moderate increase in the volume of 3-wheelers, which replaced jeepneys, the previously dominant transport mode. Though the cost of using a 3-wheeler was higher, they were more popular due to shorter waiting time. Competition kept
transport prices below the rate of inflation in gasoline prices in recent years. Although the increase in traffic volume was not as large as anticipated at the project design stage, villagers in Palale benefited from more regular transport and reduced traveling and waiting times.

**Sorsogon Study Areas.** The Sorsogon project site (Barangay 2 Palale) and the control site (Barangay Bical) had similar socioeconomic profiles. The main production in both was coconut, with little else existing as a cash crop. The traditional abaca production failed in the late 1990s due to bunchy-top disease, a problem throughout Sorsogon. There was a noticeable lack of intercropping in both areas, though there was some banana production. Both communities were consequently heavily dependent upon the price of copra. Much of the copra was sold to a dealer in the nearby center of San Francisco, midway between Palale and Bulan. There was a high concentration of land ownership in both the project and control locations, with the majority of local inhabitants being either agricultural wage laborers or tenant farmers of large landowners. Households were closely associated through kinship. As in many other areas in the Philippines, both project and control sites had their own elementary school within the barangay, although facilities were inadequate. In terms of accessibility, the sites were different. While Palale was on the study road 10 km from Bulan town, Bical was a 30–40 minutes walk from the nearest road, which was a further 3–4 km from the study road. Access between Bical and the roadhead was by track, with agricultural goods and other larger items transported by buffalo. Access to Bical was over two rivers without crossings; during the rainy season these rivers flooded and the barangay center became inaccessible. Palale had a protected tap water source, but water quality was an acute problem in Bical, particularly during the rainy season, because open wells and rivers were the main sources of water. Unlike high schoolers in Palale, who had year-round access to the high school on the project road, Bical high schoolers had difficulty of access during the rainy season.

**Fifth Road Improvement Project, Philippines**

**Negros, Philippines: Moises Padilla-Guinpiana’An Road.** This segment was part of 72 km of road rehabilitated in 1996 under a countrywide project. The segment is 13.5 km long and now links the national highway with Canla-on City. It is now used as a by-pass for intercity buses and large sugarcane trucks, as the surface is better, although the route is longer. Many of the larger vehicles using the road and passing through the project site do not stop and are of little value to its inhabitants. Fast speeds, however, impose an increased risk of road accidents. During harvesting season, large sugarcane trucks service the haciendas, which predominate in the area. The increased volume of private transport and competition meant that villagers benefited from reduced transportation costs, both for local travel by motorcycle or 3-wheeler and for longer distance travel by bus from nearby centers. Villagers overwhelmingly classified the available transport services as “good” in the passenger survey.

**Negros Study Areas.** The Negros project site (Barangay Magallon Cadre) and control site (Barangay Macagahay) were similar in their sociocultural backgrounds and asset holdings. However, accessibility constraints resulted in their agricultural production being different. Project site production was overwhelmingly sugarcane. A large proportion of the study community worked in the haciendas, providing seasonal labor to large absentee landowners of these estates during the peak season (October to February); at other times, employment was scarce. The dominant crop in the control site (Macagahay) was maize for subsistence food needs. Opportunities were sparse due to the poor terrain and long distance to the road and other settlements. Sugarcane was not grown due to the absence of a road network. There were schools in both areas and a health center in the project site. In terms of accessibility, the sites were quite dif-

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2 A barangay is the smallest administrative unit in the Philippines. It is headed by a barangay captain, who is elected by the community for 2–3 years.
different. Magallon Cadre is located 3 km from the national road junction along the project road, and the community enjoyed ready access to the nearby town center, where there was a market. The control site was separated from the road by a large river. It was accessible over a footbridge or by boat. The center of the barangay was a further 45-minute walk through steep terrain. During the rainy season, the control site was isolated, and travel became dangerous. Its nearest market center was on the other side of the river, where the control site villagers bought and sold commodities during market days and accessed the health center.

North Western Province Water Resources Development Project, Sri Lanka

KURUNEGALA, SRI LANKA: AMBALE-INGINIMITIYA ROAD. This road was rehabilitated as part of a wider irrigation project to improve irrigation tank facilities and market access for farmers in the area through better roads. The study road segment is 16.5 km long, running from the junction of the national highway to the Inginimitiya irrigation tank. The section through the study community was completed in December 1998. A small bridge reconstructed under the project was particularly important in guaranteeing all-weather access along the link. The road section was in good condition, perhaps due to the severe lack of rain over the previous 3 years. Due to frequent overspilling from irrigation tanks, accessibility was difficult before rehabilitation. Bicycles were the main means of transport along the road, with a few 3-wheelers, which came only on request. The main public form of transport was the state bus service. Hand tractors were used when needed. The road rehabilitation improved the regularity with which the bus came, as it was no longer hampered by seasonal access difficulties. Motorcycle and bicycle traders collected fish and milk from the villages and transported them to nearby areas.

KURUNEGALA STUDY AREAS. The project site (Nugannoruwa) and control sites (Walahanikalla and Wembuwa)³ were similar in socioeconomic profile. Rice production was dominant. Other crops were grown in traditional drylands, and the communities increasingly relied upon cattle as a source of livelihood due to the water shortage that prevailed over 2–3 years. In both sites, most of the paddy fields were dry, with just one area fed by a tank with sufficient water for one crop per year. Production potential was somewhat better in this control site than in the project site because of greater water availability in the control site, which is why people continued to live there despite accessibility constraints. The people in the other control site, Wembuwa, moved to the area 15 years before. There were strong social ties of marriage and kinship within each village. The school used by all the sites was in an adjacent village, and the health facilities were in the nearby town of Nikaweratiya. Access to the project site and control sites was quite different. The project site village is adjacent to the study road, halfway between the provincial road and the irrigation tank. Both control communities were, however, more than 45 minutes from a bus route on the study road. Despite this, control site villagers had to access the same community hall, schooling, and health facilities when needed, but first had to access the road via the project site. Wembuwa was at the end of a motorable track, which then branched off into a series of footpaths. The main access to the study road was across the fields and along a nearby tank bund.

Southern Provincial Roads Improvement Project, Sri Lanka

MATARA, SRI LANKA: URUBOKKA-KATUWANA ROAD. The study road segment is 10.5 km long, and runs between two major parallel transportation routes. The existing gravel road was poorly maintained and had become virtually impassable prior to rehabilitation. The road was rehabilitated under the project in 2001, and was currently in good condition. There

³ Due to low density of population, two control sites were selected to allow a sufficient number of households to participate in the survey (Appendix 5).
was evidence of a substantial increase in traffic volume along the road, and of roadside development (green-tea leaf collection centers, small stores). The much heavier volume of traffic here (than on the Kurunegala project road) was partly because the road now served as a bypass between the two parallel road networks, with larger trucks and goods vehicles taking advantage of the better surface. The villagers preferred motorcycles to bicycles because of the steep gradient. The high integration of this area into the cash economy meant that some households had motorcycles. A bus and a minibus offered public transportation services. A new state bus service was also planned. Modified trucks transported tea estate workers to the estates. Since the rehabilitation, the transportation price on 3-wheelers fell by half due to the better road surface and increased competition.

Matara Study Areas. Both project site and control sites were very similar in their socioeconomic profile, with tea as the main product in both project (Heegoda) and control (Makiliyathanne) sites. There was some spice production. Conditions were good for lowland green-tea leaf production, and there was a high level of commercialization and integration into the cash economy. Villagers were either smallholders or worked in the commercial tea-growing plantations. The poor in both areas worked in the tea plantations. There was fluidity in the concept of the village here in both sites, with few villagers sure of which village they actually belonged to. There were no community organizations in either site, though there were strong social and family networks in operation. The nearest school to both areas was on the main road through Heegoda. Accessibility, though, was very different in these locations. While the project site was adjacent to the road, the control community lived on the upper slopes on either side of the study road and was accessible by long, winding, stone paths that cut across the slopes. The villagers in Makiliyathanne were very conscious of the difficulties they faced without road access; they used the same services and institutions as the project site villagers, but felt the benefits of the road beneath were passing them by. Due to the steep track access, everything had to be headloaded, because even tractors got stuck on the path.
APPENDIX 3

Poverty Details

This appendix shows how the study dealt with the issue of poverty, capturing its multidimensional aspects as well as its relativeness across communities and countries, and within a community. The community definitions of poverty in each location, as well as key poverty themes common to all locations, are presented here.

It was important for the study to try to capture processes of impoverishment. Poverty appears to be not simply the lack of one asset or entitlement, but the juxtaposition of a number of different pressures and vulnerabilities, and is a dynamic process. It is often the combination of a number of different factors that locks a household into a downward poverty spiral from which it is increasingly difficult to escape: “Poverty never results from the lack of one thing, but from many interlocking factors that cluster in poor people’s experiences and definitions of poverty.” Since poverty is complex and multidimensional, this study was concerned with capturing what responses are necessary to address these downward spirals, and what role roads play, either in isolation or in combination with other factors, in reducing susceptibility to poverty. In particular, the study team sought to understand what role roads play in a successful strategy for escaping from complex poverty situations.

Who Are the Poor?

DEFINITION. Poverty is here defined as a deprivation in assets and entitlements essential to life, and a susceptibility to periodic physical and economic shocks and to seasonal crises. Poverty also describes a state of voicelessness and an inability to influence the structures, institutions, and processes that shape livelihoods. Fieldwork revolved around the analysis of livelihoods using a capital assets-based approach. It was assumed that people may have five principal types of capital assets (physical, financial, natural, human, and social), and the relative strengths and weaknesses of these assets determine vulnerability, susceptibility to shocks, and ability to participate in wider institutions and processes. The relationship of the assets to the institutions, structures, and processes at work is represented in Figure A3.1.

POVERTY IN THE COUNTRY CONTEXT. The study did not rely on income poverty line definitions but rather analyzed poverty as a multidimensional concept. Therefore, the concept is not directly comparable to the income and headcount definitions of poverty. This multidimensional aspect was operationally defined by the communities themselves: Within a community, the socioeconomic groups were classified as very poor (structural poor), poor (transient poor), and better off (nonpoor) in a variety of ways, falling into three robust groups that were used in the analysis. However, the areas selected were those with a high incidence of poverty to begin with because of the poverty focus of the study. As such, these areas were not representative of the countries in general. Although in this context it may be desirable to understand how these groups relate to the national poverty definition (particularly to see whether the better-off groups in these locations would be considered poor under the national definition), it is not correct to compare these different definitions. There are no directly comparable data available for this comparison within the study. However, some idea of this comparison can be considered by looking at the proportion of socioeconomic groups using both definitions. In all project and control areas, the better-off proportion of the community was only about a third. The nonpoor percentage above the poverty line in each of the

Figure A3.1: Relationship of Livelihood Assets to Structural Conditions, Institutions, and Processes at Work

three countries (top 65% in the Philippines, 60% in Sri Lanka, and 77% in Indonesia) averaged about two thirds. Therefore, even in these high poverty incidence areas, those who belonged to the better-off group would likely be classified as nonpoor in the national sense.

Although two types of definitions were used, Table A3.1 shows that the better off in each location constituted a much smaller subgroup than the nonpoor group defined in the national sense.

**Relative Poverty Across Communities.** Material designations of poverty can be different in different locations within the same country. For example, in Matara and Kurunegala in Sri Lanka, the material designation of poverty was very different. In Matara, the community had a higher level of integration into the cash economy, and the relative level of material goods owned, even by poorer members of the community, was higher than in Kurunegala, a more remote and isolated area lacking this integration into the cash economy. Poorer groups in Matara, however, were susceptible to other poverty dynamics that might result from this greater degree of integration and closer proximity to markets, which were not present in Kurunegala, such as fluctuations in cash crop prices and delays in payment of wages. Indicators of poverty in both locations would be different, as isolation and integration into wider networks themselves bring different poverty dimensions into play. The situation in the two study areas of Indonesia was similar (Appendix 6).

**Poverty Within the Community.** Because of difficulties in establishing absolute income and material benchmarks of poverty across very different locations, the study instead sought to understand how communities themselves define and understand socioeconomic status in relation to each other. This relational approach was also intended to capture better some of the complexity and dynamism of the broader aspects of vulnerability present in each location, which were of critical interest to the study in seeing what the necessary conditions are for the poor to make use of rural roads. Lower income and vulnerable groups in each study location had different coping strategies to deal with deficits and challenges they faced.

The communities can be broken down into the following three distinct groups:

- **The “structural” poor or very poor.** The members of this group faced long-term structural factors concerning lack of access and entitlements to land and resources, which severely restricted their ability to produce beyond subsistence levels. They were most susceptible to crises resulting from natural disasters, as they had a small asset base and few networks on which to rely for support. Families with a high care factor (where some members were elderly, sick, or disabled) were heavily represented in this category. Over the six project sites and six control sites, the proportion of the very poor ranged from 10% to 40%.

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3 In the case of the Negros project site, the community-defined better-off group was 40% compared with the national nonpoor group of 65%. This is because skilled workers and professionals lived in the area on account of their work assignments, and they would naturally qualify as nonpoor in the national sense.

4 The self-perception of “quality of life” classification was used in the report when analyzing the survey data. This proved to be a straightforward measure and an effective index in evaluating poverty. The three “quality of life” strata conform very closely to combinations of other variables that were used to verify this classification into groups.
The “transient” poor or poor. This is a broad categorization covering a range of people who were extremely vulnerable to shocks and fell into “severe” poverty at times, but who also had some asset base or entitlements that gave them, potentially at least, the opportunity to move out of poverty. Many could slip into severe poverty through seasonal vulnerability. Others at the top end of this bracket were progressively securing themselves against poverty by building up their asset base. Depending on the site, the proportion of the poor was between 45% and 70%.

The better off. These households had income and assets beyond their subsistence needs and could be categorized as having diverse livelihood options, wide networks often extending beyond the immediate community, and a strong and diverse asset base. Their proportion in the study locations varied between 10% and 40%.

Through the participatory study activities in each location, villagers grouped themselves according to perceived poverty status and identified what factors were important in establishing this status. The results are shown in tabular form in Table A3.2 for each project and control location. These participatory poverty classifications and definitions were supplemented by data from the household survey in two ways: First, all respondents were asked the question, “How would you rate your quality of life compared with that of most of your neighbors in this village?” Study enumerators were trained to facilitate a response to this answer by getting household respondents to consider a broad range of factors, including material assets, income, consumption, health, and feelings of well-being. Respondents’ classifications were

- better than neighbors (15%),
- worse than neighbors (34%), and
- about the same (51%).

The information within the survey was then analyzed using a number of combinations of factors to try to build a representative “poverty index” that could be applied across all three countries. Given the different socioeconomic context and livelihood strategies in each of the areas and the different levels of general development in each, this was necessarily a subjective exercise. Nevertheless, by these criteria, it was found that household survey responses could, in fact, be banded into three broad groups and that the distribution of each group corresponded quite closely to the levels of self-perception articulated in response to the survey “quality of life” question and the participatory research findings. Through three different sources, then, the classification of poverty groups and their approximate size were validated.

Key Poverty Themes Common to All Study Locations

Research activities in all study locations revealed a number of key common themes that condition household susceptibility to poverty, summarized in the following subsections.

Resource Endowments

**LAND AND LABOR.** The ability to command access over natural resources is critical in determining whether or not a household is poor. This was the case across all the study communities. Without any form of land, it was clearly difficult for households to “graduate” from poverty, as they had no capital other than their labor. Without land, most of the productive time was spent in wage labor to meet the subsistence needs of the household, and there were few opportunities to accumulate savings, as rates for wage labor were at subsistence levels throughout the study locations. The situation was compounded where the educational level of household adults was low, as the potential then for engaging in more lucrative, skilled employment was also reduced. A lack of land means that the poor are unlikely to have much to trade or sell outside the community and are therefore less likely to use a road, no matter what its condition.

Among all survey respondents in all case study areas (project and control sites), 26% did not farm any land whatsoever. Figure A3.2 shows the percentage distribution of farming activities among survey respondents. Although 74% of households farmed, either their own land or land belonging to others through tenancy, a large majority (78%) also worked as agricultural laborers at some time during the agricultural cycle. This was because the farmers were working extremely small plots of land that were barely sufficient to meet their needs. The size distribution of landholdings among all survey respondents can be seen in Figure A3.3: 40% farmed up to 0.5 hectare (ha) and 60% up to 1 ha. Among the very poor, 50% farmed less than 0.5 ha and 75% less than 1 ha.

**LIVESTOCK.** Animals were an important source of livelihood security in all project locations and were also a principal source of income in some areas. Ownership of livestock was therefore a critical socioeconomic indicator. For the

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1 A state where households are forced to use what few assets they have to borrow in order to meet their immediate consumption needs.
2 The survey captured how many households were receiving state assistance in some form. This was not a useful indicator of poverty, because the level of households receiving assistance was very high (71%). Fieldwork clearly indicated that qualification for state assistance in Indonesia and Sri Lanka was often determined as much by political allegiance and party membership as by any assessment based upon need.
3 The variables used in this exercise were percentage of household income from agricultural labor, percentage of household income spent on food, status of land ownership, size of landholding, months of food insecurity, and materials used in construction of house.
4 “All survey respondents” means all project and control site groups in all three countries.
<table>
<thead>
<tr>
<th></th>
<th>Very Poor</th>
<th>Poor</th>
<th>Better Off</th>
<th>Rich*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Bengkulu Project Site</strong></td>
<td>15%: Have no land and no permanent job. Work casually as daily laborers. Have a very poor or temporary house. They do not have anything.</td>
<td>60%: Do not have permanent income sources. If they have land, landholding is limited. Monthly income is insufficient to cover living expenses for a month. Have inadequate housing.</td>
<td>25%: Have a permanent job, enough to eat, and no debt.</td>
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</tr>
<tr>
<td><strong>Bengkulu Control Site</strong></td>
<td>25%: Household members suffering from a physical handicap. An acute lack of funds and insufficient clothing.</td>
<td>60%: Insufficient money for the family’s daily consumption needs, thus lack of food. Poor house with bamboo floor and walls.</td>
<td>15%: Sufficient food and possessions to lead a simple life; enough money for daily family needs. Have a bicycle for transportation or money to buy a bicycle, and enough money to provide for the children’s daily needs.</td>
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<tr>
<td><strong>Yogyakarta Project Site</strong></td>
<td>20%: No land for farming and no cattle. House has bamboo walls and an earth floor. No material possessions like a radio. Only rarely make a trip outside the village.</td>
<td>60%: Have less than 0.5 ha of farmland, most of which is hilly. No cow or bicycle. Main occupation is farm laboring.</td>
<td>15%: Have approximately 1 ha of either paddy or plantation land, a well-constructed house, a cow, and maybe some goats. Also have a motorcycle and television.</td>
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<tr>
<td><strong>Yogyakarta Control Site</strong></td>
<td>25%: Have a very basic house, no land, no cattle, no bicycle or radio, and no petromax lantern.</td>
<td>45%: Have land of approximately 0.25 ha. May have chickens and a goat. Have a badly constructed house, no petromax lantern, and no bicycle or radio.</td>
<td>20%: Have farmland of approximately 0.75 ha; a cow, chickens, and goats; a well-constructed, permanent house; and a radio and bicycle.</td>
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<tr>
<td><strong>Sorsogon Project Site</strong></td>
<td>10%: The absolutely, chronically poor, with no land and solely reliant upon the income from daily wage labor.</td>
<td>60%: High levels of gradation within this group from the seasonally vulnerable to those who are now fairly secure. All have some form of livelihood enhancement potential such as engaging in small craftwork or selling forest products. Many still rely upon wage labor, but have regular employment with landowners and so have a guaranteed income source.</td>
<td>30%: Have a significant current accumulation of capital, and have the potential and opportunity to accumulate more. This group has a high degree of land ownership and access to income and employment opportunities outside the immediate area.</td>
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<tr>
<td><strong>Sorsogon Control Site</strong></td>
<td>10%: Similar to the situation in the project area, with this group landless and overwhelmingly reliant upon wage labor.</td>
<td>70%: As with the project area, in a state of transient poverty, i.e., still extremely vulnerable and prone to slipping back into acute poverty, but having some potential for development.</td>
<td>20%: As in the project area, although the number of better-off people is smaller, partly because the concentration of land is more acute, but also because the potential for engaging in other activities is smaller due to the area’s remoteness.</td>
<td></td>
</tr>
</tbody>
</table>

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*Some communities defined a fourth group (rich), although few if any in their community belonged to this group.

b No villagers in the study area were deemed to fall into this category, but the community was clear about what distinguishes this group.
### Table A3.2 continued

<table>
<thead>
<tr>
<th>Very Poor</th>
<th>Poor</th>
<th>Better Off</th>
<th>Rich*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Negros Project Site</strong></td>
<td>60%: Those who have difficulty in meeting even their daily food requirements throughout the year. Usually landless and work as laborers in the sugarcane haciendas and as general but unskilled laborers elsewhere.</td>
<td>35%: Tenant farmers, those in business, and fixed income professionals. Skilled workers such as drivers, mechanics, and carpenters.</td>
<td>5%: Large landowners who own 80% of the agricultural land of the village, 65% of which is planted with sugarcane.</td>
</tr>
<tr>
<td><strong>Negros Control Site</strong></td>
<td>70%: Access to some land, upon which they plant staples for subsistence, such as maize and rice. Some self-employment in other livelihood activities.</td>
<td>10%: Those owning land or who are professionals, such as teachers living in the area as part of their work assignment.</td>
<td></td>
</tr>
<tr>
<td>20%: Landless and largely jobless, with only temporary or seasonal laboring opportunities. Low level of education of household heads, and large family size.</td>
<td>50%: The broadly poor who are midway between being acutely poor and comfortable.</td>
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<td></td>
</tr>
<tr>
<td><strong>Kurunegala Project Site</strong></td>
<td>30%: Those who are landless and totally dependent upon wage labor for subsistence.</td>
<td>10%: Comfortable through having a fixed source of income or salaried employment.</td>
<td>10%: Having a good standard of living, primarily owning a lot of land in the village.</td>
</tr>
<tr>
<td><strong>Kurunegala Control Site</strong></td>
<td>50%: The broadly poor who are midway between being acutely poor and comfortable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control area is made up of two locations due to low population in each: Walahinikalla and Wembuwa.*</td>
<td>10%: Comfortable through having a fixed source of income or salaried employment.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Matara Project Site</strong></td>
<td>45%: Also dependent upon wage labor to a large degree, but with more consolidated security in the form of some temporary or seasonal income alternative or a small piece of land.</td>
<td>15%: State sector employees, those with some form of enterprise and those owning more than 0.8 ha of land.</td>
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</tr>
<tr>
<td>40%: Solely dependent upon wage labor and with a low bargaining position, so often having to wait for full payment.</td>
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<tr>
<td><strong>Matara Control Site</strong></td>
<td>60%: Average, i.e., not comfortable or secure, but not totally insecure.</td>
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</tr>
<tr>
<td>30%: Solely dependent upon wage labor and therefore prone to income insecurity.</td>
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<tr>
<td><strong>Source:</strong> From participatory rural assessment poverty ranking and definitions activities and village social mapping.</td>
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</tbody>
</table>

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*Classification of the poor in the Negros project site is slightly different because of the structure of agro-industrialization in the area; there is a large wage-labor base working in sugar plantations. The socioeconomic groups identified by villagers are those who labor (poor), those who have some alternative source of income (better off), and the landowning rich. The category of poor includes those who, in other study areas, have been identified as poor and very poor.

*The Walahinikalla control area is an extension of the Kurunegala project site and the same classifications, therefore, apply. In the Wembuwa control area, less time was spent, and poverty ranking by community was not completed. The self-perceptions and poverty index from household surveys show that the categories are broadly similar, with approximately 40% very poor, 50% poor, and a small group (10%) being better off.

*ha = hectare.
poor and very poor, small animals acted as both savings and investments and were usually sold to meet a short-term need for capital to overcome some difficulty or crisis, such as the costs of medical treatment for a sick family member.

Forest Products. For the poor and very poor, forest products were key assets, because these people usually lacked land upon which to grow cash crops. Forest products were gathered from vacant lands and forests in or outside the village, often requiring considerable time and effort. Forest products were more frequently collected in control locations (26% of households) than in project locations (18%), and were sold primarily in the market (34%), to neighbors or shopkeepers (19%), or to visiting buyers (16%). Forest products collected included firewood, green-leaf food plants, herbs and medicinal plants, bamboo, and raw materials for making baskets and other craftwork. Seasonal crops like mushrooms were also sometimes collected.

Debt Cycles
The level of household indebtedness was a key poverty indicator. Many poorer farmers and wage laborers in the study communities were heavily reliant upon credit extended by agricultural intermediaries and moneylenders. Tenants and poor farmers borrowed money against the next season’s crop at times of the year when they were most vulnerable. Intermediaries consequently dictated the price at which this debt could be relieved, and often the households could not pay off the debt with the proceeds from one crop. Hence, a debt cycle developed. For intermediaries, this system ensured their supply and enabled them to dictate the price at which they bought. Indebtedness also compelled the poor to sell any surplus they had immediately upon harvesting, at a time when the price was likely to be lowest. Those dependent upon wage labor also got credit from large landowners for whom they worked regularly as a means of overcoming periodic crises and food shortfalls during the off-peak agricultural season. Credit from landowners to laborers ensured a labor obligation in the future when it would be most needed, i.e., during peak harvest times when labor might otherwise be difficult to obtain.

Formal credit sources have numerous requirements usually outside of the scope of the poor to meet. They also require a degree of literacy; and the credit outlets are located at centers away from the village. In contrast, intermediaries operate in the village and offer immediate credit at any time. High levels of indebtedness and chronic debt cycles mean that the poor have no capital with which to invest in the new opportunities that better roads may bring. It also means that they have no opportunity or incentive for exploring other markets, where prices for crops may be better, because they are locked into relationships of debt from which they cannot easily escape.

Family and Community
Household Size and Composition. In all of the study locations, there appeared to be a high correlation between large family size and poverty. Whether having a large number of children is a symptom or a cause of poverty is a moot point, but it is probably both. Children offer a potential source of future livelihood security for poor families, but also require a high level of care in terms of income, resources, and time. When the care burden is heavy, productive members of the household are forced to stay at home to engage in care tasks, and the potential labor base of the household is therefore reduced.

Social Networks and Longevity of Residence. Close relationships of family and group are features of rural societies throughout Asia, and all of the study locations clearly showed how important, complex, and dense these networks can be. The social capital that these relationships embody is the critical glue for communities, and shapes many aspects of rural livelihoods. These connections offer security in times of hardship and are an important social safety net for the poor, with those better off in the group obliged by
tradition to look after the more vulnerable. In many of the study locations, extended families lived in a “compound” arrangement, with a variety of standards of housing, reflecting the relative affluence or impoverishment of different members of the extended family group. Family and kinship networks are also important in working productive resources, like land, and are critical in enabling households to accumulate and to diversify incomes. It is the lack of access to an immediate family or social support network that really distinguishes the critically poor from other members of the community. The very poor often lack these dense social networks, because they have recently moved to the area from elsewhere, or because they do not have immediate family and social ties in the community. Longevity of residence enables family groups to build up relationships of trust and mutuality with neighbors. Longevity of residence across a number of generations combined with available family labor appears to be a successful remedy in enabling the family group to move from poverty.

In many of the study locations, extended families lived in a “compound” arrangement, with a variety of standards of housing, reflecting the relative affluence or impoverishment of different members of the extended family group.
## Sample Framework for Documenting Field Research

<table>
<thead>
<tr>
<th>Condition</th>
<th>Field Observation</th>
<th>Impact Indicator</th>
<th>+ or - Link to Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Structural Conditions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Geography</strong></td>
<td>■ Type of geographic conditions and terrain observed</td>
<td>■ Physical difficulties associated with movement of people and goods</td>
<td>■ Sets the conditions for the type of transport that prevails or is possible</td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Levels of air and noise pollution</td>
<td>■ Influences the cost of improving transport infrastructure</td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Degree of soil erosion and slope instability</td>
<td>■ Road construction and road itself may bring environmental degradation through air and noise pollution, slope instability, and soil erosion</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>■ Proximity to marketing centers and centers of administration/information</td>
<td>■ Connectivity of location to outside locations</td>
<td>■ Distance of households from marketing center, community facilities, capital city, coast, roads, and other infrastructure</td>
</tr>
<tr>
<td></td>
<td>■ Proximity to coast and to natural resources (mineral deposits, forests, etc.)</td>
<td>■ Household travel patterns</td>
<td></td>
</tr>
<tr>
<td><strong>Seasonality</strong></td>
<td>■ Degree to which vulnerability increases at different times during the year</td>
<td>■ Food security through the year</td>
<td>■ Lack of all-season access to community and all-season roads</td>
</tr>
<tr>
<td></td>
<td>■ Reduced availability of land—high incidence of landlessness</td>
<td>■ Household income through the year</td>
<td>■ Seasonal demand for transport services</td>
</tr>
<tr>
<td></td>
<td>■ Subsistence agricultural production with no generation of surplus—high incidence of food insecurity</td>
<td>■ Impact of changing climatic conditions through the year</td>
<td>■ Level of effective demand for transport services and potential for demand growth in the future</td>
</tr>
<tr>
<td><strong>Population Density</strong></td>
<td>■ Population impoverished or infrastructure recently damaged by natural disasters</td>
<td>■ Per capita land distribution</td>
<td>■ Population pressure as a restraint to agricultural accumulation through lack of land</td>
</tr>
<tr>
<td><strong>Shocks</strong></td>
<td></td>
<td>■ Rate of population increase</td>
<td>■ Susceptibility to natural and human shocks and disasters (floods, famine, drought, and tsunami)</td>
</tr>
<tr>
<td><strong>Capital Assets</strong></td>
<td>■ Size of holding of cultivable land</td>
<td>■ Concentration of land ownership and incidence of landlessness</td>
<td>■ Changes in land use through greater exploitation of local resources (minerals, forestry), and increased competition for land and resources (alienating the poor)</td>
</tr>
<tr>
<td><strong>Natural</strong></td>
<td>■ Security of land tenure</td>
<td>■ Common property resources</td>
<td>■ Distance and time to household’s productive assets may change</td>
</tr>
<tr>
<td></td>
<td>■ Distance to nearest available water source</td>
<td>■ Availability of water and fuelwood</td>
<td>■ Increased contact with other social groups, strengthening social capital through better opportunities for travel</td>
</tr>
<tr>
<td></td>
<td>■ Distance to energy source and non-timber forest products</td>
<td></td>
<td>■ More opportunity for social travel at lower cost</td>
</tr>
<tr>
<td></td>
<td>■ Quality of available land and natural resources</td>
<td></td>
<td>■ Access to information technology, new services, and opportunities</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>■ Levels of access to the means and opportunity for different kinds of travel (household chores, productive, and social) between and within households</td>
<td>■ Frequency of trips to marketing and social centers</td>
<td></td>
</tr>
<tr>
<td></td>
<td>■ Social and cultural restraints for women to travel</td>
<td>■ Frequency of travel within and outside the immediate area</td>
<td></td>
</tr>
<tr>
<td></td>
<td>■ Division of household labor and the availability of time</td>
<td>■ Number of trips made for different tasks</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>■ Travel patterns for different household members</td>
<td></td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Condition</th>
<th>Field Observation</th>
<th>Impact Indicator</th>
<th>+ or - Link to Transport</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Community-based groups and organizations that are active</td>
<td>Attendance at public meetings and levels of voting</td>
<td>Exposure to social ills like drugs and prostitution</td>
</tr>
<tr>
<td></td>
<td>Participation in decision making</td>
<td>Levels of different kinds of migration</td>
<td>Improved access, strengthening the hand of exclusionary groups</td>
</tr>
<tr>
<td></td>
<td>Scale of seasonal and permanent outmigration</td>
<td>Level of bicycle ownership</td>
<td>Improved ability to travel for water and energy needs</td>
</tr>
<tr>
<td></td>
<td>Frequency of travel to visit friends and relatives</td>
<td>Levels of motorized and nonmotorized vehicles on the road</td>
<td>Formal and informal employment generation in construction, maintenance, and related service delivery</td>
</tr>
<tr>
<td></td>
<td>Impact of improved communications and opportunities upon local social structure</td>
<td>Road condition; degree to which road is regularly maintained</td>
<td>Better communications service delivery (post, telephone, etc.)</td>
</tr>
<tr>
<td></td>
<td>Location of markets and efficiency and accessibility of marketing system</td>
<td>Infrastructure provision (number of telephones, electricity connections, etc.)</td>
<td>Improved access to seeds, fertilizers, and other agricultural inputs</td>
</tr>
<tr>
<td></td>
<td>Road maintenance regime, whether or not local communities are involved</td>
<td>Existence of local industries and other labor opportunities</td>
<td>Quality of road versus level of investment and perceived benefit. Is it good value?</td>
</tr>
<tr>
<td></td>
<td>Provision of other infrastructure services to the location (electricity, water, and communications)</td>
<td>Local craft production for sale</td>
<td>Availability and affordability of transport services on the road</td>
</tr>
<tr>
<td></td>
<td>Availability of employment (seasonal or regular)</td>
<td>Level of remittances sent/received</td>
<td>Opportunities for outside employment</td>
</tr>
<tr>
<td></td>
<td>Prices for agricultural inputs; state of banking and formal credit facilities, and credit/lending environment for the poor</td>
<td>Commercial environment for transport operators</td>
<td>Reduced transport costs (operation and maintenance) for operators, and passed on (or not) to users</td>
</tr>
<tr>
<td></td>
<td>Household dependency upon remittances</td>
<td></td>
<td>Reduced travel times and increased levels of service</td>
</tr>
<tr>
<td></td>
<td>Affordability and availability of local transport services</td>
<td></td>
<td>Improved transport, increased labor productivity</td>
</tr>
<tr>
<td>Financial</td>
<td></td>
<td></td>
<td>Decreased farm input costs and produce prices</td>
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<td></td>
<td></td>
<td></td>
<td>Improved income, improved access to markets, credit and savings facilities</td>
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<td></td>
<td>Location of credit facilities</td>
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<td></td>
<td>Improved access to health care and to education and extension services</td>
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<td>Poor road and services limit ability to reach education/health services</td>
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<td>Lack of education/health infrastructure facilities and the means of transport to reach them</td>
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<td>Susceptibility to spread of HIV/AIDS</td>
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<td></td>
<td>Increased risk of road accidents</td>
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<td></td>
<td>Increased time available for the poor</td>
</tr>
<tr>
<td>Human</td>
<td></td>
<td></td>
<td>Improved road and transport sector tariffs and regulatory framework for trade</td>
</tr>
<tr>
<td></td>
<td>Availability of teachers and educational materials</td>
<td>Days teacher/doctor in residence</td>
<td>Environment for transport operators</td>
</tr>
<tr>
<td></td>
<td>Availability of qualified health professional staff, medicines</td>
<td>School and health center attendance</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Frequency of health and education staff’s attendance in the location</td>
<td>Visits by extension staff</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incidences of disease and state of health of population</td>
<td>Effort expended on travel (gender disaggregated)</td>
<td></td>
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<tr>
<td></td>
<td>Level of education and skills training</td>
<td>Comparison of women’s and men’s labor tasks, and transport needs</td>
<td></td>
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<tr>
<td></td>
<td>Availability of time</td>
<td>Number and frequency of road accidents</td>
<td></td>
</tr>
<tr>
<td>Institutions and Processes</td>
<td>Competitiveness of local agricultural produce in the market place</td>
<td>National laws, regulations, and guiding documents for rural transport sector</td>
<td></td>
</tr>
<tr>
<td>National Government (including laws and regulations)</td>
<td>Supply of specialized agricultural produce from the location</td>
<td>Import tariffs on bicycles</td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Field Observation</td>
<td>Impact Indicator</td>
<td>+ or - Link to Transport</td>
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<tr>
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</tr>
<tr>
<td>Regional and Local Government (including laws and regulations)</td>
<td>Participation of local people in decision making</td>
<td>Regulatory framework for transport operators</td>
<td>Linkage of area to national markets</td>
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<tr>
<td></td>
<td>Participation of local people in infrastructure and services planning, provision, and maintenance</td>
<td>National programs for microcredit and support to the poor</td>
<td>Contractual arrangements for infrastructure tendering and maintenance regimes</td>
</tr>
<tr>
<td></td>
<td>Availability of extension workers and effectiveness of dissemination activities</td>
<td>Road safety laws</td>
<td>Spending priorities on pro-poor transport</td>
</tr>
<tr>
<td></td>
<td>Effectiveness of local government development activities</td>
<td>Frequency of extension service delivery</td>
<td>Effectiveness of local level infrastructure delivery and maintenance</td>
</tr>
<tr>
<td></td>
<td>Taxes and regulations</td>
<td>Participation in meetings, voting</td>
<td>Provision of local “social” transport services (i.e., farm to market)</td>
</tr>
<tr>
<td></td>
<td>Existence of local government pro-poor programs</td>
<td>Effectiveness of interaction between local government agencies and NGOs/CBOs</td>
<td>Linkage of local people into the market</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Local government pro-poor programs</td>
<td>Linkage of communities into decision-making bodies and processes</td>
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<tr>
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<td></td>
<td></td>
<td>Provision of government bodies’ support to agricultural and other services</td>
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<td></td>
<td>Provision of transport services</td>
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<td></td>
<td>Local contractors in partnership with government, responsible for infrastructure delivery and maintenance</td>
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<td></td>
<td>Interventions to improve transport at local level through appropriate technologies</td>
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<td></td>
<td>Mobilization of community groups for lobbying and community-based initiatives for locally defined needs</td>
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<td>Determine the distribution of opportunities and benefits, set norms for cultural practice</td>
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<td>Relationship of locality to the state</td>
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<td></td>
<td>Excluding certain ethnic or religious groups from transport businesses</td>
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<td></td>
<td></td>
<td>Determine whether women can travel for trade</td>
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<td>Women excluded from taking public transport, using bicycles, or trading outside the community</td>
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<td>Women lack time to diversify their livelihoods—are time and energy deficient as they have a heavy burden of household work</td>
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Regional and Local Government (including laws and regulations) include: Regional Government, Local Government (including laws and regulations). Private Sector includes: NGOs and CBOs. NGOs and CBOs include: NGOs, CBOs. Traditional Authorities include: Traditional Authorities. Cultural Norms and Practices include: Cultural Norms and Practices. Gender Relations include: Gender Relations. CBO = community-based organization, HIV/AIDS = human immunodeficiency virus/acquired immunodeficiency syndrome, NGO = nongovernment organization.
APPENDIX 5

Case Study Details in Sri Lanka

Introduction

This appendix presents the information on the Sri Lanka case studies in summary form. More details are available in the country report.1 The two road projects selected as case studies were the North Western Province Water Resources Development Project (NWP-WRDP)2 and the Southern Provincial Roads Improvement Project (SPRIP).3

North Western Province Water Resources Development Project

DESCRIPTION OF NWP-WRDP. The main objective of the project was to improve the economic, social, and nutritional well-being of the people living in the project area by increasing the income of local farmers, diversifying to higher value crops, and increasing employment opportunities for the unemployed and women. To meet these objectives, the project had the following components:

- rehabilitation, improvement, and restoration of rural infrastructure including major, medium, and minor irrigation systems and rural roads;
- credit lines for developing farmer-owned irrigation systems (wells and lift pumps) and to rural women for establishing income-generating activities; and
- institutional support in the form of facilities; equipment; training; consulting services; and monitoring of project implementation, benefits, and environmental impact.

The development of rural roads was only one component of a large and diverse project; 415 kilometers (km) of class D and E roads and 573 km of agricultural roads were completed under the project. The selection of roads was based on the intention to provide access to individual villages and irrigation schemes and to link them to provincial highways. The work primarily entailed broadening carriageways, graveling the surface, and improving culverts and bridges.

NWP-WRDP SETTING. North Western Province (NWP) of Sri Lanka, comprising the districts of Kurunegala and Puttlam, has a diverse ecology spanning three major zones: wet, intermediate, and dry. The primary crops vary from predominantly coconut in the coastal areas to paddy in the interior dry zone. The road density in NWP is higher than the national average, particularly for rural roads. The topography of the region enables low-cost construction of basic tracks, which has been a popular activity for self-help components of a number of rural development programs. Tracks over time become upgraded to gravel roads. The area focused upon by this study was Kotewehera Divisional Secretary’s (DS) Division of Kurunegala District. The road connecting the provincial capital of Kurunegala to Puttalam runs by the side of Kotewehera DS Division. The study area is in the interior of the division.

Description of the Study Areas in Kurunegala

AMBALA-INGINIMITIYA ROAD, KURUNEGALA. The road segment selected was a class D road from Ambala Junction in Kotewehera to the Inginimitiya tank dam, a length of 16.5 km. It fell under the purview of the Wariyapola Divisional Engineering Office of the NWP provincial council. The road was developed in three phases: the first 4 km was metalled and tarred in 1995; kilometer 4 to kilometer 8 was gravelled in 1996; and kilometer 8 to kilometer 16.5, going through the case study village, was gravelled in 1998.

The first 4-km segment was in good condition. The presence of potholes was moderate along the gravel road over the next 4-km stretch. But the condition deteriorated, with many potholes, thereafter. Overall, however, the road was in usable condition. The culverts along the road and the bridge at kilometer 16 were also in good condition.

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3 Loan 1567-SRI(SF) for $30 million, approved on 30 October 1997.
drains on either side were not continuous and were partly filed with loose gravel, perhaps causing the road to become inundated during heavy rains. The road was maintained by the North Western Provincial Engineering Department, which received SLRs12,000 per km per year for the task. The method of maintenance was by direct labor. Maintenance of gravel roads is mainly in terms of motorgrading, especially after heavy rains. This was done at the end of 2000.

**Kurunegala Project Site.** The case study village of Nugannoruwa is a traditional village. The houses are clustered together, bordered by the Nugannoruwa tank and wetland paddy fields on one side and dryland farms on the other. The project road runs across the side of the village. A gravel road circles the inner side of the village with a network of tracks and footpaths leading off to individual households. The 118 households, of which 4 were female headed, were linked by very strong kinship ties through a high level of intermarriage. Lower income households relied to a great degree on the support of relatively more economically stable ones.

This area borders Sri Lanka’s dry zone and had suffered from a severe drought for the previous 3 years. The irrigation tanks surrounding the village were dry, and farmers who were unable to pursue paddy cultivation as a livelihood were relying upon traditional forms of dryland agriculture, akin to shifting cultivation. Problem ranking with different groups of villagers showed that this crisis afforded all members of the community and not just the landowners, as poorer villagers were tied into the paddy economy through daily wage labor. While richer landowning villagers had assets and savings upon which they could rely in a crisis, the poor seldom had this support, and so fell quickly into a cycle of impoverishment from which it became increasingly difficult to escape.

Due to the prevailing water crisis, more and more food items had to be purchased, and the debts to village shops increased. The shopkeepers generally gave credit for small items until the end of the week, but full payment was made only rarely. The shopkeepers bought stocks on credit from vendors in the town with whom they had good relations. The high degree of social cohesion also resulted in very active community organizations. The funeral aid society of Nugannoruwa expanded to include activities such as managing the village preschool in the community hall built by it. It was also the controlling body for fishing in the Nugannoruwa tank.

**Kurunegala Control Site.** The control area was made up of two villages, Walahinikalla and Wembuwa, which are at least 45 minutes’ walk from the bus route. Both were populated by families that had moved into these less connected regions mainly due to the availability of cultivable land. Walahinikalla is an extension of Nugannoruwa. All households in Walahinikalla participate in the social activities and the community organizations of Nugannoruwa. Villagers in Nugannoruwa own paddy lands in the Walahinikalla fields. These are the only fields that were cultivated during the drought. It is the availability of water that lured families to move to this more remote area. Of 11 households, two were occupied during the daytime by elderly widows who went back to Nugannoruwa to sleep, as access to health care in an emergency was difficult from Walahinikalla. Similar to the project site, the primary livelihood source was paddy farming supplemented by livestock rearing, which had increased substantially over the last few years. The land in the high ground enabled pasturing, home gardening, and the cultivation of coconuts. The main preoccupation of the community was the lack of a road, an issue that came up frequently in communication with the study team.

The 28 families that made up Wembuwa were mostly young families that had migrated from villages in the region over the previous 15 years in search of land. The structure of the community was much looser than in Walahinikalla. The village was approached by a track that dwindled out to a network of ill-defined footpaths. The boundaries of the village were not very well defined. There were no community organizations. However, this village was not as inward looking as would be expected, given the level of isolation. Almost every household had a migrant member, either in the Middle East, in another town in the province, or in the capital city. Though the villagers of Wembuwa were as isolated as those of Walahinikalla, they seemed less preoccupied with the problem, which may have been because they could access the road by creating footpaths across the flat land. Walahinikalla, on the other hand, could be completely cut off from the road network, especially during the wet season when the tank spills over.

**Southern Provincial Roads Improvement Project description of SPRIP.** The rationale of the project was to improve rural accessibility and reduce road transport costs, as these are prerequisites to achieving economic growth and poverty reduction. The primary benefits of the project were perceived in terms of reduced road transport costs as a result of improved accessibility and reduced maintenance.

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4 A section of the road of 5.6 km that goes through Inginimitiya dam was maintained by the Irrigation Department.

5 Funeral aid societies (maranadhara samithi) are the most dynamic and successful community organizations in both rural and urban Sri Lanka. These societies are self-mobilized and have the primary function of providing bereaved families with support after a death. Most societies have now spread to include other functions.

6 Fisherfolk are charged a 50% levy on their catch, and the funds are used for tank maintenance.

7 The identification of a sufficiently populated control site was a problem. Due to high road density, the accessibility criterion used was a minimum of 45 minutes walking distance to a bus route. But it was not possible to find villages that were sufficiently populated to enable a random sampling of 40 households. Therefore, two villages that were at least 45 minutes’ walking distance from the Inginimitiya Road bus route were selected for a census rather than a sample survey. Even then, the number of usable household surveys completed in the control area was only 29.
costs. The main beneficiaries were expected to be the rural population and other low-income groups in Southern Province. The project commenced implementation in April 1998 and was scheduled for completion by December 2003. Implementation was through the Southern Province Road Development Authority, which reported through the Southern Provincial Council to the Ministry of Provincial Councils and Local Government of the Central Government.

The project objectives were to (i) rehabilitate about 550 km of the 1,800-km secondary road network in Southern Province; (ii) improve the capacity of the Southern Province Road Development Authority (SPRDA) to manage the network efficiently and effectively; and (iii) develop the institutional, financial, and private sector contracting resources needed for sustainable road maintenance. To meet these objectives, the project included three components: civil works for road and bridge rehabilitation, SPRDA capacity building, and consulting services for project implementation.

The SPRIP developed a system of prioritizing roads for selection. Each road under consideration was ranked based on key indicators of present road condition, economic development potential, and social needs. Economic development potential focused on the number of villages, land use patterns, commercial activities such as shops, industrial activities such as factories, availability of public transport, and traffic levels. Social needs concentrated on identifying disadvantaged communities. The percentages of the population receiving government benefits for the economically disadvantaged and with access to public utilities were the key indicators used in the ranking. The weighting given to the economic and social aspects reflects the orientation of the project toward economic growth and poverty reduction.

SPRIP Setting. Southern Province is made up of the three districts of Galle, Matara, and Hambantota. It displays great diversity in ecology and correspondingly in the economy. Approximately 45% of the population is employed in the agriculture sector, made up of coconut cultivation in the wet and intermediate coastal areas; and tea, rubber, and spices in the hilly, wet zone in the north. Paddy is cultivated extensively in the dry, flat zone as well as in the river valleys throughout the province. The levels of connectivity in Southern Province do not compare well with national averages, particularly in terms of rural roads. The case study area was located in Pasgoda DS Division in Matara District. Here, of the existing roads, only about 50% could be used by all types of vehicles, while over 15% could not be used by any vehicles. This area’s economy is based on small-holder tea, coconut, and cinnamon.

### Description of the Study Areas in Matara

**Urubokka-Katuwana Road, Matara.** The selected road section in Southern Province was a class C road from Urubokka to Katuwana, 10.5 km in length. SPRDA managed it. The Makandura divisional engineer (under the Matara district engineer) was allocated SLRs10 million annually to maintain 171 km of paved roads and 40 km of gravel roads. Normally, roads were patched three times per year, while those that were extremely poorly motorable were patched as many as 12 times per year. The method of maintenance was by direct labor, but this was expected to change to tendered contracts. The study road was in good condition, since construction was completed in 2001. The road surface was a single bitumen surface treatment with 14-millimeter metal chips and was expected to be strengthened with a chip sealing. The ground surface throughout was strengthened with an asphalt-based concrete layer prior to construction. A high gradient section of around 300 meters was concreted to avoid erosion. There were two bridges at kilometer 2 and kilometer 5. In 1988, the road was widened and graveled, and it was tarred in 1994. It deteriorated due to its narrowness and the lack of maintenance and was almost unusable for vehicles prior to the SPRIP rehabilitation.

**Matara Project Site.** The sections of the villages in Heegoda Grama Niladari (GN) Division, which were in close proximity to the project road, were used as the project site. The Heegoda GN Division was made up of seven loosely structured villages populated by 490 households, 6% of which were female headed. Villagers were not always clear as to which village they belonged to within the division, in stark contrast to those in the project site in Kurunegala. The terrain over which the Heegoda GN villages were spread may make it less possible for the boundaries to be identified. The fact that some households living by the roadside had agricultural land on the higher slopes

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1. Information based on communication with General Manager, SPRDA, and on Southern Provincial Roads Improvement Project, Phase 1 Final Report.
3. The bridge at kilometer 5 was about 3 m and at an intersection with a sharp bend. The 2-door bus coming from Katuwana had to back up four times to cross it.
4. Data from Heegoda GN office.
may also have contributed to the fluidity. The project sites did not have any functioning community organizations, either self-generated or externally facilitated. The only public institution that operated at some level and had village-wide membership was the temple. Community-level organizations that were sponsored by the state did exist, but came into operation only when the state bureaucracy necessitated it. However, friendship and kinship ties were quite strong and were frequently relied upon for livelihood. The community was benefiting from the strong price for low-altitude tea. Prices for farmers’ produce were good, and laboring opportunities in the plantations were available.

Matara Control Site. The control area households were on the upper slopes of Makiliyatenna GN Division. While 310 households made up the eight villages of Makiliyatenna GN Division, about half of them lived on the upper slopes of the hills on either side of the Katuwana Road. The villagers of Karawilakanda, Diddenikanda, and Darandala made up the majority of the control site sample. As in the project site, a very fluid sense of village existed. In common with the project area, the control area also had no public institutions or common spaces in the villages. The existence of only two very small retail shops and the network of water sources meant that even the traditional informal meeting points did not function. Overall, the community in the control area was very similar to that of the project area. The differences stemmed almost exclusively from their locations in terms of the control site being on the higher slopes and therefore having poor access to a motorable road. The hardships and indignities faced by the villagers when accessing the towns and the need for a road were articulated frequently at focus group meetings. There was a strong feeling that the benefits of the improved Katuwana Road were passing them by. The track that led up to the upper slopes was in very bad condition. Even if a group hired a tractor to bring up some fertilizer, it would get only partway up the track, requiring the operators to push it. In such an instance, headloading was the only alternative. The villagers of the control site had to access the same institutions and services as those in the project site, and this increased their sense of being marginalized.

Transport Situation

Kurunegala Project Site. The primary transport asset of the villagers of Nugannoruwa was the bicycle. All households had access to a bicycle, either their own or a neighbor’s. This mode was used extensively by both men and women within the village and for short distances out of the village. Mobile traders on bicycles traded fish, milk, fruits, etc. Transporting of cargo (water, firewood, grain, etc.) on bicycles was primarily a male task, though women took children to school. The main mode of transport from the village to the nearest town (Nikaweratiya) was bus, goods being charged at the rate of approximately SLRs20 per gunny bag. Salaried employees and older schoolchil-

12 Data from the Makiliyatenna GN office.
13 During the rainy season, people carried fresh clothes to change into before getting into the bus because they had to slide down in the mud to get to the road.
contributed to the improvement of the road at some stage through *shramadana* programs by lending their vehicle for transporting earth, etc.\(^{14}\)

Another villager owned the only truck in the village, which was used for transporting cow dung to Kalpitiya. There was demand for more trucks for transporting cow dung. The same villager also owned the only van in the village, an air-conditioned 15-seater. The demand for this vehicle was less other than on auspicious or religious days. The driver was paid 20\% commission from the rentals. There was no 3-wheeler in the village. However, villagers accessed 3-wheelers in neighboring villages and those at a 3-wheeler park near the main road at Kotewehera. Most of the garment sector workers returning to the village for holidays used 3-wheelers, which were also used to access health care and other emergency needs as well as to transport cargo.

**Kurunegala Control Site.** The transport infrastructure and services available to the control site community were the same as those available to the project site community. The crucial difference was, however, that they had to first get to the road. At certain times of the year, it was possible to use a bicycle over the footpaths created over the dry paddy fields and tank bund. In keeping with the high ownership of bicycles in the project village, over half of the houses in the control sites also owned bicycles. As in the project area, both men and women used bicycles. Very often, bicycles were used to transport cargo even if it had to be wheeled a significant part of the way. Adults preferred to wheel young children to school, as it was much faster and less tiring than walking with them. The greatest problems were faced during emergencies. Transferring patients to the hospital was the major constraint. Unless the patient could sit on a bicycle, the only option was to use a modified stretcher or a “sick chair.” Both of these entailed significant hard labor to carry the chair over ill-defined tracks, especially at night.

**Matara Project Site.** The traffic on this road was much heavier than on the NWP-WRDP study road (Appendix 1, Table A1.1), because it provided a short route between two parallel road networks running from the coast to the interior of Matara and Hambantota districts. The most popular personal vehicle in this area was the motorbike. The popularity of the motorbike over the peddle bicycle was a reflection of both the hilly topography of the area as well as the relatively higher income levels from cash cropping in Matara compared with Kurunegala. However, the majority had very low engine power. There were only two buses (both privately owned) plying the section of the road past the study sites. The one-way fare was SLRs20. Usually, the buses had a specified schedule. The operators said that the passenger demand was high on Saturday (market day) and that the buses did not operate on a time schedule that day but rather commenced the journey as soon as the bus was loaded to capacity. On Saturday, an additional private van ran between Udagomadiya and Katuwana. According to sources at RTC, a new bus plying between Katuwana and Urubokka was expected soon after the fieldwork period. The transport service was very clearly in a dynamic stage of expansion, with even long-distance RTC buses going through. If more buses started using this road as a link route, the service available to the villagers would increase dramatically, provided that the buses stopped along Katuwana Road.

Tea estate trucks are cargo vehicles that have been modified to carry village labor at the tea companies’ cost to large and medium-scale tea estates. There were two modified trucks and one bus going to the Kiriwanaganga Tea Estate, which is the largest in the area. A vehicle was paid SLRs1,450 per day for two trips, one in the morning and one in the evening. The timing was adjusted to enable the transport of both day and night shift workers in the two directions. In addition, there were about 10 more modified trucks going to estates in Morawaka, Deniyaya, and Waralla (all over 30 km away). These vehicles were also paid in the range of SLRs1,500 per day. Two 3-wheelers were parked

\(^{14}\) *Shramadana* is a community activity for which each household contributes whatever possible such as labor, food, or equipment.
near the Nagaha Junction (close to the project site) and near the Udagomadiya Bridge (close to the control site). There were other 3-wheelers in households along the road that did not park at the hiring points but were available for hire. The 3-wheel hire charge for distances less than 3 km was between SLR30 and SLR50 per km. Each additional kilometer was charged from SLR10 to SLR20. Those from outside the village were charged more than villagers. The 3-wheeler operators were of the opinion that their income was lower after the completion of the road project. Three-wheelers were used essentially for nonroutine travel and for visiting the hospital, most frequently when children were sick. Hand tractors and trucks were used to transport green leaf (unprocessed tea leaves) from the collection points to the factories. Cultivators headloaded the tea to the collection points on the road.

**MATARA CONTROL SITE.** As in the case of the Kurunegala control site, the households in the control area relied on the same transport infrastructure and services as those in the project site. The critical difference arose from the much harder terrain faced by the control area prior to accessing the motorable road. A few households had invested in motorbikes, primarily as an income-generating asset. Most used them to access employment outside the area or, as in the case of a small retail shop owner, to assist in transporting cargo up the slope. The situation in terms of taking the sick to the hospital was far worse than in the control area in Kurunegala. While the same methods of stretchers and sick chairs were used here, the hilly and slippery terrain made it a far more difficult and dangerous task. Very often, there was no option but for a sick person to walk unaided at least up to the track that came up from the road.

**Poverty Situation**

The poverty situation in Sri Lanka presents an unconventional duality, as the level of human development is far higher than could be expected on the basis of its gross domestic product (GDP). The GDP per capita of $820 ranked Sri Lanka as a lower income nation, 137th in the world. However, in terms of human development, Sri Lanka ranked 81st in the world, with a human development index of 0.735. Consumption poverty remained a major issue, as approximately one third of the population failed to achieve an acceptable quality of life. The incidence of poverty at the lower poverty line of SLR791 per person per month at 1995/96 prices was 25.2%. At the higher poverty line of SLR950, the incidence was 39%.16

**Kurunegala Project Site**

Discussions on the levels of economic stability and poverty in the village were strongly colored by the current water crisis. The level of dependence on paddy farming and agricultural wage labor as a factor defining poverty came out strongly. The causes of poverty were identified as the lack of a livelihood source, large number of young children, lack of land and livestock, and—specific to women—being abandoned by the male breadwinner. In the focus group discussions, 20% of the village was deemed to have a good standard of living (better off and rich) because of fixed/salaried income or other sources. This group was better able to cope with a crisis situation. The worst affected were identified as 30% of the households that were totally dependent on agricultural wage labor (very poor). The rest (50%) of the households were in between (poor). In the survey, the self-perception of comparative quality of life was quite similar, with 28% perceiving themselves as “better off than others,” while 20% thought themselves “worse off than others,” leaving 42% “about the same as others.”

**LANDHOLDINGS.** This problem of lack of water—rainfed or irrigated—had been gradually aggravated over the previous few years and had now begun to take on crisis proportions. Its impact was felt by the entire village irrespective of their income status. The only fields that were cultivated for at least one season were those that were fed by the Walahinikalla tank, which was adjacent to the control site. The project site tank was conserved for consumption. Access to land was fairly equitable, with only about 10% of the households being landless, and most family groups (but not all household units) having some land in the Walahinikalla fields as well as the Nugannoruwa fields. The size of landholdings varied dramatically; about three family groups held a majority of the land. The situation could have been rather different if farmers with larger holdings had used up the existing water at the expense of the smaller farmers. The strength of the farmers’ society, kinship ties, and community cohesion seem to be factors that prevented this from arising.

**CHANGING LIVELIHOOD PATTERNS.** Despite the current attempts to distribute water equitably, being deprived of the primary source of income and livelihood had different impacts on households. Those households with large land-
holdings, which previously had had a strong income flow, were able to build on their assets to cope with the changing situation. The case study of Mr. D (Main Text, Box 4) shows that the movement into transport and trade-related enterprises was a way of taking advantage of family savings and wealth to diversify successfully when cultivation deteriorated. These households also had the advantage of having a concentration of better paid and stable outside employment. In addition to better sources of information and external links, the long-term higher income levels, which enabled family members to stay in school longer, were now paying off, as almost all these households contained employed graduates or teachers. One of the more positive aspects of the conditions in Nugannoruwa was education. The level of education in the village was very high. The majority of those under 40 years old had received 8–10 years of education. Over the previous 10 years, seven students had graduated from Sri Jayawardena Pura University in Colombo, either as internal or external students.17 The interest in education was increasing as the need to look for external employment increased.

Households with smaller landholdings were also turning to other sources of income. Increased dependence on livestock was a clearly visible trend. Cattle and buffalo were reared primarily for milk and dung. Due to the existence of a system of leasing animals, households with few assets could move into dairy farming. The milk was sold either to individual traders who collected door to door or at the milk cooperative situated in the adjoining village (Main Text, Box 10). Trading in fish and free-growing seasonal fruits such as tamarind, lime, and mango was yet another source of income for lower income households. The most vulnerable were those households that had always relied on wage labor; their asset base was very low, frequently limited to a bicycle and basic farming tools. The reduced opportunity for wage labor due to reduced agricultural activity was a critical factor in the low-income problem ranking. The shortage of water, exacerbated by crop destruction by wild elephants, created a situation wherein over 60% of the families in the household survey reported a scarcity of food. This was felt more keenly by the lower income groups with little supplementary cash income. They had to survive on a day-to-day basis, purchasing some vegetables from the few surviving home gardens or the village shops. In the case of the higher income group, it was nutrition rather than food that was identified as a problem.

Kurunegala Control Site
Since most families in the two control sites of Walahinikalla and Wembuwa had moved there to seek better livelihood opportunities, they were generally poor. The self-perceptions of the households in the two control sites were either worse than others (43%), better than others (7%), or about the same (50%). While the possibility of accessing external sources of income was much lower here than in the project site, the potential for subsistence home gardening was greater. There was little difference in the conditions faced in paddy cultivation, as the fields around Walahinikalla were farmed by households in the project site as well. Most families in Walahinikalla owned very small plots of land. As such, food insecurity was a problem faced equally in the project as well as control sites. The crucial dimensions of poverty identified by the focus group in Walahinikalla related more to issues of access to health, education, and employment opportunities, and to isolation, which constrained the improvement in housing. Unlike in the project area, the issue of access overrode the issue of quality of health care. The lack of access was a matter not only of life and death but also of human dignity.18 Despite the difficulty of access, most families encouraged children’s education, and the average levels differed little from those in the project site. However, there were no undergraduates or graduates in the control site.

The situation in the second control site was quite different. Reflecting the history and structure of the community, the villagers of Wembuwa had varied sources of livelihood. Few owned and cultivated paddy land. Most of those who did cultivate paddy did so as tenants. As in other villages, the lack of water and encroaching wild elephants made paddy farming an insecure livelihood, and livestock rearing was extensively practiced. Traders from towns in the region leased out cattle to be reared and then sold back to them. A comparatively large number of families had members employed outside the village. Middle East employment, work in the garment sector, and other low-level private sector employment were quite common. The standard of education was considerably lower than that of the project area or of Walahinikalla. The children of this village went to the same school as those in the project area and in the other control area. However, in addition to a 45-minute walk on average, they had to take a bus to reach school. It was particularly difficult to send younger children to school, as they had to be accompanied by adults. The migrant nature of these families was also a factor that disrupted schooling, especially in the case of young adults. Housing conditions in both Walahinikalla and Wembuwa were poor. There were only 11 houses made of brick, and of these 7 were unfinished. All the rest were clay and mud. The cost and inconvenience of transporting building materials had to a large degree caused this situation. Correspondingly, the existence of safe sanitation was very low: over 40% of the households used open fields. This contrasted sharply with the fact that only 12% of the households in the project area did not have access to a private latrine.

17 Source: Probation and Childcare Officer.
18 A patient who died from a snake bite after a week in the hospital could not be brought home for burial due to floods.
Matara Project Site
The size of landholdings was a crucial factor in sustaining poverty. In the Heegoda GN Division, to which the project area belonged, 36% of the households owned 16% of the land of less than 0.2 hectare (ha) each. Twelve percent of the land, plots of between 0.4 and 1 ha each, was held by only 10 households. The majority of the households (54%) held between 0.2 and 0.4 ha of land, which made up 40% of the total land area. The group with less than 0.2 ha of land could not generate sufficient income from cash cropping and depended heavily on wage labor. The intermediate group could meet their basic needs but also engaged in supplementary activities like wage labor, skilled labor, or microenterprises to augment their household income. The advantage of tea smallholdings is that household labor can easily be divided between own land and wage labor. A parcel of land of up to 0.4 ha would need only 1 day of labor per week. Although the level of land ownership was not highly concentrated, because landholdings were small and the poor were required to work in the tea plantations throughout the year to keep their jobs, this limited their opportunity for exploring more lucrative livelihood alternatives. The participatory rural assessments identified dependence on wage labor as the critical factor differentiating the poor and nonpoor. Over 80% of the households were dependent to a high degree on wage labor and thus could be considered poor or very poor. Of these, families that had to depend totally on wage labor were seen as the chronically disadvantaged. A factor identified by the focus group as aggravating the impoverishing effects of wage labor was its low bargaining power. This meant that full payment was rarely made at the end of the day's work. The 15-day payment cycle caused problems of liquidity for those working on tea estates, as they had no savings. Focus groups were reluctant to identify any group as rich. Instead, they categorized those who worked only on their own land and/or had state sector employment as economically stable and better off. To this group were added those who had other sources of income based on enterprises. It was also this group that benefited from the opportunities offered in the project area due to the proximity to the road. The majority of enterprises—such as retail shops; tea collection points; hiring of 3-wheelers, vans, and trucks—were established by this group.

The levels suggested by the focus groups and the self-perceptions of the households corresponded fairly closely. According to the self-perceptions, 15% were better than others, 42.5% were about the same, and 42.5% were worse than others. The groups that considered themselves “about the same” and “worse than others” together roughly equaled the 80% suggested by the focus group as being poor. In terms of education, just 1% had a tertiary education. Given the project area’s proximity and potential accessibility to a high quality school, these are very unfavorable achievements. In the poorer families where both parents were wage laborers, children were frequently left unattended for the entire day. There were also opportunities for older children to find income-generating activities informally in tea smallholdings, deterring them from attending school. On the other hand, the educated young were very well informed of external events and used all possible means to derive information to expand their opportunities for income generation.

Matara Control Site
Similar to the project area, the control area focus group identified the ownership of sufficient tea land as a critical factor in a household being nonpoor. A smallholding of about 1 ha was perceived as being sufficient to prevent a household being dependent on wage labor and thereby prone to income insecurity. The major difference between the control and project sites lay in the fact that in the control area, wage labor was often away from home from very early hours in the morning until late evening due to the time taken to walk down to the pickup points of the estate vans. Focus group discussions segmented the village along the lines of economic ability as economically stable (10%), average (60%), and very poor (30%). The self-perceptions in the household survey reflected 10% as better than others, 55% about the same, and 35% worse than others. Education in the control area was even more unfavorable than in the project area, with issues of child supervision as well as access. The children attended Makiliyatenna Primary School (a lower standard than Urubokka school), as Urubokka was too far to walk. Only secondary school children could attend Urubokka Central College, but it was difficult to qualify for admission. Families who wanted to ensure a complete education for their children took the option of boarding them at a relative’s or friend’s house in Urubokka or elsewhere. The villagers in the control area used the same health facilities as those in the project area. For a patient to walk or be carried down this route was extremely hazardous. From the road, they could hire a 3-wheeler or use the bus. After the road rehabilitation, the number of 3-wheelers by the road increased, and the fare decreased.

Transport Impacts and Linkages to Poverty
This section looks at how the road and the transport system interacted with poverty in different microsocioeconomies and different groups within the communities. While it is understood that isolating one contributory factor from the host of issues that combine to create an impact is a difficult task, what has been attempted is to draw plausible links based on the information gathered.

19 Data from Heegoda GN Office.
20 Data provided by the Heegoda GN office based on those collected for the 2001 National Census.
The Road as an Enabling Factor in Income Generation

The impact of the road on the primary occupations of paddy (Kurunegala) and tea (Matara) cultivation was very different. This was due to the difference between the subsistence and cash cropping orientation of the two livelihood forms, as well as to the crisis situation faced by paddy farming. However, the road was linked strongly to other sources of income, albeit in very different ways.

Despite the water crisis, paddy remained the primary occupation of the majority of the households—at least in perception, if not in reality. The prolonged water shortage, aggravated by wild elephant encroachments, had made the harvest very poor for the previous 3 years. The sale of paddy had fallen to negligible levels, because the households maintained stocks both to ensure food security as well as to provide a form of saving. Hence, few traders came to the village to purchase rice. Transport was important in bringing the harvest home from the fields and in taking it to the mill to be ground. While the modes of transport differed for each activity, the project road played little part in the moving of produce, as most travel involved was internal to the village. The dry, hardened paddy fields where the bunds were opened enabled hand tractors to drive right up to the threshing site. Once the paddy was stored near the homes of the farmers, small quantities were taken to the village mill by bicycle as the need arose. In stark contrast to tea cultivation, headloading was seen very rarely.

For all tea smallholders, irrespective of their socioeconomic group, the benefits of the road were in both monetary and nonmonetary forms. Given the demand for green-leaf tea, the improved road brought better prices, greater reliability in regular collection, and delivery of fertilizer to the starting point of the track. The collectors could no longer justify a high and fluctuating transport cost deduction from the factory price, and increasing competition among collectors brought a better price. All collection points were on the project road. The plots were on the higher slopes, and the crop had to be headloaded in both the project and control areas. In most households, family members headloaded the crop to the roadside. For the economically less secure group, the benefits were primarily nonmonetary. The price paid for daily labor did not increase significantly. However, access to larger estates became less difficult, as the estates provided free transport to all registered labor. Twelve converted trucks picked up workers from appointed points along the road in the morning and dropped them back in the late evening. There was more free time now for other livelihood or leisure activities. Even control site households now had greater potential to register with the larger estates as permanent labor and thus reap the monetary benefits of year-end and new year bonus and provident fund contributions.

The occupational forms were very closely tied with the road. All salaried employees outside the village relied on the public transport system. Migrant wage labor used predominantly the bicycle or the bus. Other sources of income generation were being developed by the villagers as a direct reaction to the problems faced in farming.

The Road as a Safety Net

In Kurunegala, the water crisis hit hardest the households with no diversified income base and low levels of assets. While those with diversified income sources were rapidly expanding them, others were developing into new sources of income based on existing asset, knowledge, and/or network bases. In most cases, the households had to look beyond the confines of the village or fields and thus came into direct contact with issues relating to transport and the road. Mr. D’s household (Main Text, Box 4) is a good example of diversified income sources with a strong asset base, which expanded directly into transport-related economic activities. Even households with a much lower asset base were increasingly turning to mobile trading as a coping mechanism as farming became unsustainable. As the majority of the households owned a bicycle, this was frequently the asset base with which they worked. Networks open to the household were frequently a critical decision variable about what exactly would be traded, e.g., fish or fruits such as mango, tamarind, and lime. Moving up the asset base, those with access to credit purchased motorcycles to carry out trading activities. The rehabilitated road enabled all-weather timely access for a fish-laden bicycle, ensuring the.
success of the activity. As expected, the condition of the road had a direct bearing on the ability and motivation of households to rely on these coping mechanisms. Both ease of travel and safety (in terms of wastage of cargo due to bicycles or motorcycles sliding off the road) were facilitated by the road improvement. The road also offered livelihood options to households with no private transport assets. Another livelihood that developed was the production of milk for a cooperative that was established in the next village. The cooperative relied on the truck arriving every day to collect the milk to transport for onward distribution. Before the road was rehabilitated, the road surface had been poor, the truck had been slow, and the road had often been impassable during the rains and therefore not reliable. Now, villagers knew that the truck would come every day, and this certainty gave them the security to invest their time and resources in developing their cattle holdings. In addition to milk, cow dung became an important source of supplementary income. Trucks collected cow dung directly from the stalls. For poor families for which paddy farming barely provided sufficient rice even for subsistence, quite apart from being an income-generating source, these new sources of income became critical for survival.

The complete immersion of the SPRIP study site in the cash economy meant that a greater number of households were seeing the increased connectivity resulting from the improved road as providing income-generating opportunities. The number of small retail shops along the Katuwana Road increased rapidly. More tea collection points opened after the road improvement in 2001. The sustainability of these economic activities needs to be considered as time passes. In Matara, the opportunities presented by the road development were taken advantage of primarily by those who lived along the road (retail shops) and/or who had an asset base or network to build upon. The perception that most benefits from the improved road accrued to traders was very prevalent within the community. However, households that seemed asset poor were also taking advantage of the situation. The region's natural ability to host a variety of wet-zone tree food crops, spices, and fruits enabled even the poorest households to earn a small additional income by selling these free-growing items to traders, who now frequented the Katuwana Road.

Road and Transport as a Contributory Factor to Quality of Life

The collection of water and firewood is a primary function for survival. The two study areas provide very different examples of how problems of access can be approached. In the Kurunegala project site, a majority of households used the Nugannoruwa tank on the village boundary for all subsistence purposes except drinking. The road and path network of the village enabled the use of simple, manually powered vehicles to meet the subsistence needs of households in terms of water and firewood and thereby to substantially reduce the burden of carrying water and firewood over long distances. However, little was done in terms of increasing the carrying capacity of the bicycles by modifying their luggage space or attaching trailers. As a result, the villagers spent considerable time and effort on these basic tasks. In contrast, in the Matara study site, access to subsistence requirements of water and firewood did not pose many problems in either the project or the control site. The vegetation of the region allowed firewood to be collected by most households from the immediate vicinity. A network of feeder streams and springs was tapped for piped water for drinking and cooking, thereby saving time.

Economically secure households were able to buy provisions in the weekly market at a competitive price, while the lower income groups relied on purchasing small quantities. The increase in the number of shops in the village meant that there was better access to retail goods to meet immediate requirements. However, the prices did not come down. The condition of the house was one of the primary indicators of someone's economic status. The inability to improve the housing conditions without considerable expense and effort was seen as a major drawback created by the lack of good link roads along the hilly areas of the Matara control site. The movement of building material meant a costly exercise in hiring headloaders or tractors. The alternative was for the family to headload building material whenever time permitted, which was expensive and inefficient. This problem was seen in the control site in Kurunegala as well. The much higher quality of housing in the project sites in comparison with the control sites was more due to the problems of transporting building material than of different income levels.

The control site households articulated the effect of the lack of roads on human dignity as an issue separate from income-related deprivations. The sense of isolation and marginalization was very high in these communities. This was especially the case with households that identified strongly with better connected households of similar socioeconomic status in all other respects. The high road density seems to have increased the aspirations of all communities in terms of being well connected.

**A Core Issue: Access to Health Care**

Better access to health care, especially in emergency situations, was mentioned as a primary contribution of the road by all groups of villagers and was substantiated by the findings of the household survey. In the Matara site, the increased use of 3-wheelers to take patients to the hospital and the reduction in hiring charges were cited as major elements of change since the road was improved. Participatory rural assessment activities in Kurunegala revealed that emergency access and prenatal access had improved since a van had been purchased by a villager. The van in the village was accessible at all times of the day and night, which enabled quicker and safer transfer to the hospital than the alternatives of using a hand tractor or 3-wheeler. The same applied to the increasing availability of 3-wheeler taxi in the
Matara site. The insecurity felt by families with young children and aging adults due to difficulties of accessing health care was discussed in greatest detail and with strongest emotion in the focus group discussions of the control areas. Reliance on relationships of trust and kinship in cases of emergency was very high.

Penetration of State Mobile Services into the Village
While certain services require the villagers to access them, others are effective only if accessed on site. Civil security provided by the mobile police units, the services of health and agriculture extension officers, and utilities such as electricity and telephones need to penetrate into the villages if provision is to be effective. The villagers in the control areas constantly articulated the fact that the providers of such services rarely made the effort to come to areas that were difficult to access. This was especially the case in the Makiliyatenna area, where the steep footpaths made access particularly troublesome. The opening of a region by laying a road or upgrading one can have a substantial impact on visits by service providers. Though this does not automatically mean higher quality of service, it does mean entry into the mainstream as in the case of civil security. While all groups within the village benefited from greater penetration by service providers, it was the low-income groups that benefited the most. As seen constantly in the study locations, the poor seldom traveled outside the immediate environment other than for income generation. Such households would avoid accessing services provided elsewhere unless in extreme situations of need.

Social Capital, Empowerment, and Felt Need for a Road
Of the two study areas, the level of social cohesion, kinship networks of support, and self-mobilization of the community were much higher in the Kurunegala sites than in the Matara sites. Despite this community involvement and initiative in ensuring the rehabilitation of the road, the villagers of the Matara sites showed more initiative and capacity to mobilize public opinion than their counterparts in Kurunegala, who came from a more educated and cohesive group. Community involvement was not part of the project design in either site. However, in Matara, the village bus owner approached the recognized traditional leader of the village (a Buddhist monk) and lobbied for rehabilitation. The critical factor for a much less cohesive village to become a substantial force in the road rehabilitation process could be the perceived benefits of the road. The marginal increase in benefits due to the enhanced quality of the road was very high. In addition, the condition of the road was critical to the economic survival of the population. In contrast, in Nugannoruwa, external connectivity was not a critical factor for survival. Despite some changing livelihood pattern as the traditional paddy economy deteriorated, it was still a fairly weak link. For the majority of the population, the condition of the road was most important in terms of accessing health care, especially in an emergency.

The level of labor participation in the road construction was very similar in both sites. Very few members of the communities were part of the labor force that rehabilitated the road (three households in Nugannoruwa and one in Heegoda). Only 6 households of 80 in both project sites expressed an interest in employment in the road construction. This was due to a lack of knowledge regarding potential wage-labor opportunities as well as a contracting system that encouraged the use of external labor.

Negative Impacts of Road Improvements
The identification of negative impacts of the road by the villagers in the study areas was on average very low. Over 75% in the NWP-WRDP and 90% in the SPRIP stated that there were no negative effects. The negative effects that were identified by a few were increases in dust, noise pollution, and traffic accidents; loss of land; and disrupted drainage. In the case of the NWP-WRDP, increased dust and its impact on health were discussed in the focus groups and subsequently reflected in the responses of the household survey. In Nugannoruwa, 80% of those who said that there were negative impacts referred mainly to the dust from the gravel road. Problems arising from increased traffic moving at faster speed were echoed in Matara, especially as a concern for children’s safety when walking to school.
APPENDIX 6

Case Study Details in Indonesia

Introduction

The study was conducted in two provinces in Indonesia: Bengkulu Province on the island of Sumatra, and Yogyakarta Special Region on Java island. The first case study focused on the Tree Crop Smallholder Sector Project (TCSSP) in Bengkulu Province, while the other case study focused on the Third Local Roads Project (TLRP).

Tree Crop Smallholder Sector Project

DESCRIPTION OF TCSSP. The TCSSP was implemented from March 1992 to March 2001 in the provinces of Aceh, Bengkulu, South Kalimantan, Central Kalimantan, and East Kalimantan. The project objective was to reduce poverty by improving the income and employment prospects of rubber and tea smallholders and landless rubber tappers, of whom over 50% were living below the poverty line. This was to be achieved by increasing the production of rubber and tea crops through variations in crop and cultivation practices. By focusing on labor-intensive crops, most of which were exported, the project aimed to contribute to equitable distribution of income and employment opportunities and enhance non-oil export earnings. It also expected a positive environmental impact by decreasing shifting cultivation and reducing soil erosion caused by undesirable farming practices in high-elevation areas. The improvement of road infrastructure was expected to develop regional economic activities and improve living conditions in rural areas.

The project scope was to establish and maintain about 75,000 hectares (ha) of rubber plantations and about 20,000 ha of tea plantations. It also included pilot projects to establish 10 small rubber tree nurseries; establish about 2,000 ha of drought-resistant tree crops; and test a low-cost approach to tree crop development by providing farmers with incentives including provision of improved planting materials, agro-inputs, and extension services for the first year of tree crop development. The project components comprised plantation establishment and maintenance; construction of roads and buildings; and support services including project administration and management, vehicles and equipment, training, and consulting services. The project was to organize farmers’ groups to introduce them to improved crop varieties and cultivation practices. The farmers’ groups received technical advice, training, organization, and management support from the executing agency. For this purpose, project management units (PMUs) with individual offices were established for each project geographic area. The PMU offices reported to a provincial office, which in turn reported to the project director in Jakarta.

TCSSP SETTING. South Bengkulu District has a total area of about 6,000 square kilometers (km²) with a population in 2001 of about 370,000. The TCSSP had two project units, one in North Bengkulu and one in South Bengkulu, with six project subunits under each. The provincial government advised the study team that Talo Subdistrict, South Bengkulu District would be a suitable study location. Talataan Subvillage of Talang Kabu Village was selected for the project site after inspection of several similar sites. The isolated village in Talang Padang served as the control site.

Description of the Study Areas in Bengkulu

BENGKULU STUDY ROAD. The project did not build rural roads in this area. Instead, it constructed farm roads in 1993 connecting the settlement area to the farms. Talang Padang-Tanah Abang Road, 16 km in length, which leads from the farm roads to the main road, was asphalted by the District Public Works Services in 1996. The villagers said that they proposed the construction of this road in anticipation of the Rubber Plantation Production Program of the TCSSP to allow easy market access. This road connects the project area to Manna (the district capital), where there is a state road that leads to Bengkulu (capital of the province). The people of Talang Kabu Village used public transportation on the

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1 Loan 1118-INO for $135 million, approved on 14 November 1991.
3 The photograph was taken at the early stages of the project.
road to go to the weekly market in adjoining Penago Village or to go to Bengkulu, the capital of Bengkulu Province, to sell their produce.

**BENGKULU PROJECT SITE.** Talang Kabu Village has an average rainfall of 308 millimeters (mm) per month with maximum rainfall in November. The land is generally flat. The village is divided into three subvillages and had 10,000 ha and a population of 470 families or 2,024 people in 2001. About 85% of families owned land in the village, but 71% considered their occupation to be agricultural laborers because of limited land ownership (<1 ha). Other sources of income included construction trades, fishing, and basket weaving. The families who did not own land (15%) worked as laborers and also did basket weaving, fishing, home industries, firewood gathering, etc. Most landowners had noncertificate status of land ownership. Through the TCSSP, 56 farmers from the Sumber Bahagia farmer group were awarded 1 ha each. Due to unfavorable soil conditions, the production of crops in the village was very low. Food crops included paddy, maize, cassava, sweet potato, groundnut, and soybean. Tree crops included rubber, coffee, coconut, jackfruit, and durian. Most farmers had rubber and/or coffee in their smallholdings. The prices of these were highly affected by fluctuations in world market prices. The farmers were reluctant and unable to invest in inputs as a result. The farmers attributed their vulnerability and uncertainty to the fluctuating prices, which made them less likely to risk increasing production if they expected that prices would fall. In that case, they were more likely to concentrate on subsistence food production.

**BENGKULU CONTROL SITE.** The Talang Padang Village control site consists of three subvillages. The village is 30–85 meters (m) above sea level. The rainfall pattern is similar to that of Talang Kabu Village. The topography is generally flat, while some areas are mountainous and sloped. Farmers in the area were unfamiliar with terrace farming or any sloping agricultural land technology. The population in 2001 was 705 people consisting of 183 families. Based on housing conditions, the houses in the area were categorized into three types: poor (22%), satisfactory (70%), and good (8%). Most of the households (95%) had about 0.3 ha; thus their economic condition was not so different from those families who did not own land (5%). Their main source of income was farm labor. Their secondary sources of income included fishing in the river, basket weaving, and gathering firewood. Those who cultivated less than 1 ha also worked as farm laborers for additional income. Therefore, it was difficult to differentiate the farmer from the laborer in the village. An exception, however, were the better-off villagers, who owned more than 1 ha. Sixty percent of farms produced paddy; 30% tree crops (rubber, coffee, durian, jackfruit, etc.); and 10% cassava, groundnut, maize, and many kinds of vegetables. The village experienced food scarcity from August to January, while extreme food scarcity existed during November and December, before harvest.

**Third Local Roads Project**

**Description of TLRP** Indonesia’s public roads are classified as either national, provincial, or district roads. The TLRP aimed at helping the government to improve the condition of district roads. This was based on feasibility studies financed by the Asian Development Bank (ADB) in 1992. Loan effectiveness was in October 1993, and it was closed in May 2000. The project covered the four populous provinces of Bali, Central Java, East Java, and Yogyakarta. Its primary objectives were to improve the condition of the district road network in the four provinces by providing financing for rehabilitation and improvement of roads in bad condition to support periodic maintenance, and to strengthen the capabilities of the Public Works Office. Its principal development objective was economic growth. Project components to fulfill these objectives were the rehabilitation or improvement of about 5,000 km of paved and unpaved roads, replacement of bridges totaling about 880 m, and periodic maintenance of about 8,600 km of roads. In addition, the project was to support the procurement of road maintenance equipment; construct workshops and laboratories; and engage consultants for the supervision of civil works, including assistance with project implementation. In Yogyakarta, the project was implemented in Sleman and Gunung Kidul districts.

**TLRP Setting.** The study area of the TLRP in Yogyakarta Province was located in Panggu Subvillage, Candirejo Village, Gunung Kidul District. The control community was in Kelayu Subvillage, Sumber Wungu Village, Tepus Subdistrict. Gunung Kidul District had a population of about 700,000 in 2001 and an area of about 1,500 km². It is located in mountainous terrain going up to 600 m above sea level. The land condition is dry, sloping, and rocky. Maximum rainfall is experienced in February with an average rainfall of 551 mm per day. Paddy can be cultivated on about 5% of the land; 45% of the land was used for dryland crops. After collaborating with the Central and District Public Works Services and upon inspection of sites, the study team decided on Semanu-Giri Panggung, a study road that transects four villages and is separated by three subdistricts. The lack of irrigation facilities was a large problem for agriculture, and land cultivation was dependent only on rain. Dryland paddy was planted in the rainy season.

**Description of the Study Areas in Yogyakarta**

**Semanu-Giri Panggung Study Road.** The road segment crosses the villages of Semanu, Candirejo, and Giri Panggung. The actual length of the road is 22 km. However, funding for the rehabilitation project covered only 10.5 km. Among the four villages transected by the road, Candirejo is between Semanu and Giri Panggung villages, both of which have weekly markets. Villagers used the road for transporting their goods to the market at least twice a week.

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*See Appendix 2 for access conditions.*
Villagers also used the road to go to various towns and capitals for other business activities. The district road was well maintained by the District Public Road Unit. The community also helped in routine maintenance by cutting grass and cleaning the side ditch and shoulder periodically using volunteers.

**Yogyakarta Project Site.** Candirejo Village is 300–600 m above sea level with an average rainfall of 2,500 mm per year. The area is hilly and mountainous, only 12% being flat. About 83% of the land was used for dryland cultivation, and there were no wetland paddy fields at all. Only 30% had certificate status of land ownership. About 63% of the villagers had less than 0.5 ha of land, while only 15% had more than 1 ha. The village had a labor force of 5,735 people, of whom 26% were unemployed. Eighty-seven percent of families got their main income from agriculture, while the rest were intermediaries and government officials involved in home industries, labor, etc. Generally, farmers had a secondary source of income like laboring on farms, in industries, or in construction work. Most farmers who had more than 2 ha of land usually had other occupations such as businesses, were intermediaries, or were involved in transportation services. Others were government officials, health service personnel, teachers, etc. Due to unfavorable land conditions (dry, unfertile soil), crop production in the area was very limited. The project road passed through an area where water retention was difficult, the soil was rocky, and it was time consuming to prepare fields for cultivation. Consequently, much of the cultivation was limited to cassava, groundnut, and some banana. Some paddy was cultivated for consumption, but diversification due to road improvement into higher value cash crops was difficult.

**Yogyakarta Control Site.** There were about 1,500 families in Sumber Wungu Village (1,833 ha). From the whole population, 110 people were illiterate and 223 had finished elementary school. Due to lack of electricity in the area, 88% of the families used traditional lamps, while 81% used firewood for cooking. The poor accessibility of the area limited the supply of petroleum. It was similar to the project site area in terms of culture, homogeneity of the community, history and background, land condition, and types of crops. Kelayu Subvillage was 6 km from the asphalt road. The villagers had to walk through rocky roads to reach the central village. The topography of the area was similar to that of Candirejo Village. Most of the area was hilly. The soil condition for agricultural production in the area was classified into fertile (30%), sufficient (8%), and unfertile (62%). Unfavorable soil conditions limited crop production in the area. The production was mainly fruits, maize, and cassava.

**Transport Situation**

Roads are governed by the Public Works Department, while transport services are the responsibility of the Communication Department. This includes the local governments (province, district, and city). The transport network is divided into main, branch, and local roads. Local primary roads are under the local government. The financing of roads is dependent on their status and function. Therefore, local primary roads receive different treatment from local secondary roads. The process of determining the feasibility of a road involves considering many factors such as traffic volume, road links, and road treatment.

The commonly used vehicle in the Bengkulu project site was the motorcycle for short distances (Appendix 1, Table A1.1). Other vehicles included vans and minibuses for long distances and nonmotorized vehicles such as bicycles. Many people, however, still preferred walking short distances and rode the bus only for long distances. In the Yogyakarta project site as well, the dominant mode of transport was the motorcycle. In addition, vans, minibuses, and buses were used, but few bicycles. In contrast, in the Sumber Wungu control area, motorized vehicles were very rare in the village. The villagers did their daily activities mostly by walking. The local road within the village was well maintained by the community without government support. It was made of gravel using the Telford construction method, by the local people themselves. Unfortunately, the community did not have the ability to upgrade the gravel road to asphalt and had requested funding support from the authorities.

**Poverty Situation**

**Bengkulu Study Areas**

The villagers’ focus group discussions in Talang Kabu concluded that around 75% of the villagers were poor and that the poor lacked sources of income, food, education, information, and housing (Appendix 3, Table A3.2). The following causes of poverty in the area were identified:

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Job opportunities for farm laborers were not available all year but only during the planting and harvest season. Lack of skills and experience made farm laborers less competitive both inside and outside the village. Unskilled village youth often could not compete with other more skilled and educated workers, even if they migrated.

The access of rural farmers to current or advanced information on farm technology was very limited. The activities of two existing (TCSSP) farmer groups were focused mainly on selling their products and not on accessing information technology. Crop pests and diseases were also a major problem in these farms.

Of the many reasons for low crop production, lack of land to cultivate was critical. The lack of funds for farm inputs also contributed to low crop production.

The lack of market information access was also a problem. Farmers’ groups needed to link up with other farming groups outside the village to establish a network and secure first-hand information on market prices to have a better bargaining position.

The sources of income of villagers, poor families, and nonpoor families are summarized in Table A6.

A very poor family had an average monthly income of Rp55,000–Rp67,000 (US$5.60–$6.83). The head of the family usually worked as a farm laborer for 8–11 days a month. The rest of the income was acquired from other odd jobs or by borrowing money from a neighbor or intermediary just to put rice on the table. The average family spent around Rp85,000 per month for very basic needs. Both very poor and poor families faced food insecurity. Their income was often insufficient so that the family’s basic food requirement was not met. Many times, these families ate only cassava, banana, and/or maize for breakfast and dinner. At times, the family did not get a chance to eat rice for 2–5 days. The poor families, however, claimed that they were used to these conditions.

In Bengkulu, intermediaries (tokeh) and traders effectively controlled market exchange in paddy and rubber with debt relationships. It was increasingly difficult for the poor to escape from these debt relationships, as indebtedness increased year on year. Numerous projects to help the poor had been implemented in the village before. However, the villagers had not been included during the planning of these projects. As a result, the village investment plan of the community did not identify the common problems and concerns of the poor. During the

### Table A6: Sources of Income of Poor and Nonpoor Families in Talang Kabu Village

<table>
<thead>
<tr>
<th>Sector</th>
<th>Poor Families</th>
<th>Nonpoor Families</th>
</tr>
</thead>
<tbody>
<tr>
<td>Labor</td>
<td>Farm and nonfarm labor</td>
<td>Not a source of income</td>
</tr>
<tr>
<td>Agriculture</td>
<td>Any kinds of beans and resin for weaving</td>
<td>Paddy, coffee, rubber, and coconut</td>
</tr>
<tr>
<td>Livestock</td>
<td>Chickens, ducks, goats (few)</td>
<td>Cows, goats, chicken, and ducks</td>
</tr>
<tr>
<td>Fishing</td>
<td>Fish</td>
<td>Not a source of income</td>
</tr>
<tr>
<td>Processing sugar</td>
<td>Palm sugar</td>
<td>Palm sugar</td>
</tr>
<tr>
<td>Shop, kiosk</td>
<td>Shopkeeper</td>
<td>Owner</td>
</tr>
<tr>
<td>Skills used</td>
<td>Make fishing equipment, basket making,</td>
<td>Skills for outside salaried employment or</td>
</tr>
<tr>
<td></td>
<td>broom making from coconut leaves, and</td>
<td>business skills</td>
</tr>
<tr>
<td></td>
<td>making fishing nets</td>
<td></td>
</tr>
</tbody>
</table>

Source: Participatory rural assessment activities in Bengkulu, Indonesia.
Poor laborer headloading paddy from farm to village settlement

implementation of road projects (district road rehabilitation and farm road construction), poor families served as laborers during the construction phase, which earned them Rp2,500 per km² or Rp75,000 (US$7.65) per month. After 1999, the government, through the social safety net program (SSNP), supplied and sold cheaper rice to the poor and poorest families.

Most of the houses in the village were dilapidated and of substandard living conditions. Walls were made from old bamboo, there was no flooring, and the roofs were made of dried grass. Only a few houses had tile roofs. The poorest houses in the area were extremely unfit and unsafe to live in and were characterized by the absence of windows, leaky roofs without ceilings, and a single bedroom. Most of these houses also did not have electricity, because it was too expensive. Only a handful of children from poor families were able to attend secondary school, and more than 75% stopped studying after elementary school. Financial constraints usually hindered these families from continuing the children’s education. Moreover, most of these families would rather have their children work as laborers instead of continuing their education, because this would add to the family’s income.

Talang Padang is a remote village. Based on the village’s focus group discussions, around 85% of the villagers were considered poor. The following criteria for characterizing the poor were identified during the discussions: physical health, living conditions, financial capability, food, means of transportation, and level of education (Appendix 3, Table A3.2). The focus group discussions identified similar causes of poverty as in the project site, but these were more acute due to lack of accessibility.

Yogyakarta Study Areas

The study community in Candirejo Village found that the community could be classified into four classes: very poor, poor, sufficient, and rich. The focus group discussion reported that 20% of families living in the village were very poor, while 60% were classified as poor. The villagers also identified five main class indicators: farmland ownership, cattle ownership, house condition, appliances, and transportation (Appendix 3, Table A3.2). Villagers who owned less than 0.5 ha of farmland were categorized as poor; this small piece of land cannot produce enough income for the family. However, according to the problem analysis, the size of land is not the main cause of poverty; the five main causes of poverty are

- low quality of produce/commodity due to farmers’ lack of skill in cultivation, pest control, and postharvest handling;
- lack of access to market information and competitive power with other markets;
- lack of roads and mode of transportation, which prevented farmers from having access to markets; thus they were taken advantage of by intermediaries;
- farmers’ inability to plant high-value crops; and
- limited sources of income; the absence of irrigation systems further limited farmers from planting other viable food crops.

Despite their collective efforts, the poor families’ generated income was still insufficient to sustain their needs. The very poor families (often with women acting as head) had a monthly income of only Rp40,000–Rp60,000 (US$4.08–$6.12). For example, a mother worked 4–6 times a week (half day), and her daughter contributed Rp30,000 every 2 months working as a domestic. They borrowed about Rp20,000–Rp40,000 from neighbors and paid back this debt by working on the lender’s farm. The family spent around Rp85,000 a month to buy rice, vegetables, water, soap, and gasoline for a lamp. Poor farmers who owned less than 0.5 ha of land had an income of Rp45,000–Rp120,000 (US$4.59–$12.23) per month. This income came from cassava, maize, and groundnut production from their own farms and from working as a farm laborer for other farmers. Generally, they borrowed around Rp10,000–Rp50,000 from intermediaries and other farmers around the village. To pay their debt, they had to sell their crops to the intermediaries at a much lower price than usual, or they repaid the other farmers by paying cash or working as laborers. The family’s expense for basic needs was about Rp150,000 per month to buy rice, vegetables, meat, water, soap, and gasoline for a lamp.

The poor and very poor families faced food insecurity. A very poor family used 50–70% of their monthly income to sustain their basic needs. They ate rice only during lunch, and had cassava, bananas, and maize for breakfast and dinner. Sometimes, these families even went for 4 days a month without eating rice. The condition of the poor was not so different from that of the very poor family. The poor family used at least 30–80% of their monthly income on basic needs. Generally, the poor family chose to borrow money from intermediaries and paid them in two ways: at an
interest rate of 25% per month or by selling their crops to the intermediary at a much lower price than usual. Borrowing money seemed to be the only way in which these poor families could survive. They tended to borrow money to sustain their daily needs and were not able to invest in other income-generating activities.

Most of the children of poor and very poor families attended only elementary school; some did not even complete that. Since they lacked skills and education, the poor and very poor families were generally incapable of working outside the farming sector. A few of them tried to establish small enterprises by making banana and cassava chips; however, their lack of capital and marketing skills meant that these businesses were short lived. Banks, village cooperatives, and other sources of capital were located in the capital subdistrict, which was about 7 km from the village. Further, these institutions required formal requirements from borrowers (i.e., collateral, a formal permit letter from the village head, a copy of an identification card, and proof that the business was running well). These requirements were unfamiliar to the poor and very poor, and they had to rely on the moneylender instead for their financial needs.

The poor and very poor also did not have information about capital resources, technology, marketing, and other information to support their income-generating activities. They were like second-class citizens in the village community. Basic and extension services from the government did not seem to be reaching them. During village meetings, the institutional representatives tended to marginalize the poor. They did not disseminate the information or decisions made in village meetings to the poor. Preparations for village development planning were normally done during community meetings at the village office. Often, the poor and very poor were not involved in such meetings, and plans did not include means to reduce poverty. Ironically, this did not seem to bother the poor, because they felt that village planning did not have any effect on them, nor did they perceive it as any of their business. They were usually involved in village activities only as hired labor. For example, they worked as laborers during the district public works road rehabilitation project. The poor were also not involved in agricultural development, extension, and health programs. After 1999, the government, through the SSNP, supplied the poor with low-priced rice (50% off the regular market price).

The household conditions of the poor were very similar to those in the project site. The poorly constructed houses resulted in family members becoming ill often. Generally, instead of going to the village health center, these families relied on indigenous medical practitioners or faith healers for medical treatment, because they could not afford the fees of the former. Only a handful of children from poor and very poor families were able to attend secondary school; more than 75% stopped studying after elementary school, similar to the Bengkulu project site. In 1998, a traditional farm labor group was established (not by the project) in the Yogyakarta project site, comprising members mainly from poor and very poor families. It involved working on each other’s farm in rotation, and it worked well during peak periods. Very poor laborers were paid cash for their work. In emergencies, the very poor asked for the payment even before they started a job.

The control community in Kelayu Subvillage of Sumber Wungu Village divided the community into four classes: very poor, poor, sufficient, and rich. Their focus group discussion revealed that 25% of the families in the village were very poor, while 45% were poor. The following indicators determined the class: type of lantern used; house condition; land ownership; cattle ownership; and ownership of transportation, radio, television, and other facilities (Appendix 3, Table A3.2).

In this large, remote subvillage, there were only three small shops with limited capital (Rp200,000–Rp450,000). Most farmers cultivated their crops with minimal inputs, while a few rich farmers had cattle and sufficient inputs. The agricultural extension services rarely came to the village because of unavailable transportation. Only one truck came to this subvillage once a week during market day, because the operators chose on other days to go to other villages with better roads. The transportation problem directly influenced the marketing of agricultural production. More importantly, this also greatly affected the price of crops and the bargaining position of farmers who sold their crops. Only a handful of intermediaries from outside the village came to collect agricultural products; thus there was not much competition. All of the intermediaries were outsiders, and the prices of commodities were dictated by the intermediaries.

Three priority problems were found common between men's and women's discussion groups: limited water supply, bad road conditions, and no electricity. There were no sources of water in the area. Each family had a water tank under the roof of their house to collect rain, which they saved as drinking water for the dry season. This supply was sufficient for 1 month after the end of the rainy season,
after which they needed to buy water from outside the village. Three mobile tanks from the local district government supplied the water every 2 days. Villagers usually bought the water in groups.

There was no asphalt road or public transportation in Kelayu Subvillage. The villagers had to walk 7 km to go to the central village or 7 km to reach the asphalt road, where public transportation was available any time. Due to this condition, supplies from outside the village were very limited. The district agriculture department conducted extension services only twice a year. The three small shops in the subvillage did not have goods available all the time. Schoolteachers also had to walk 7 km from the main asphalt road to the village school every day. During the rainy season, the teachers often did not go to school. The villagers used traditional lamps. They had no access to daily information from outside the village, because there was no television. Only a few rich families owned a radio. Small businesses that would rely on the use of electricity were also not an option for villagers.

Impact of Rural Roads and Transport

Distribution of Benefits from the Road

Economic impacts from the TLRP road rehabilitation in Yogyakarta seem to have accrued primarily to the better off in the study community and not to the poorest for a number of reasons: First, it was those with some form of capital to invest initially, even if at fairly modest levels, who were able to take advantage of the opportunities that improved access to outside markets and networks provided. The case study of Mr. N (Box A6.1) shows this clearly. The improved road essentially offered an outlet through which capital could be invested through the development of small businesses or the sale of agricultural surplus. For marginal farmers or for those dependent upon wage labor for their survival, the road offered few opportunities, as they were unable themselves to invest in any way.

Second, the travel patterns of the poor were primarily village centered. The poor had little to sell and little money to buy, so they seldom traveled outside the community, except to make trips to the market once a week or twice a month, or if an emergency necessitated an urgent trip outside. For them, improved access was important only in emergencies; otherwise their travel patterns continued much as they did before the road rehabilitation. This was the case in the TCSSP study site for travel outside the village or immediate locale. In contrast, it was the traders, merchants, and intermediaries in both locations who made most use of the road and depended heavily upon rapid and regular access in and out of the study community for their daily (or regular) economic activities.

Third, the better off in the community had the ability to access transport services and were more likely to own their own transport, particularly bicycles. During the study activities with villagers in both Bengkulu and Yogyakarta, owning a bicycle was identified as a key well-being indicator. Personal mobility and frequent travel outside the community were explicit aspects identified by villagers as distinguishing the poor from the better off.

The very poor in both Bengkulu and Yogyakarta were unlikely to regularly sell surplus agricultural produce unless illness or some household crisis required it. In these cases, food security for the household was seriously compromised as a consequence. The very poor were often engaged in both study areas in selling firewood, grass, and other forest products that they could gather to augment their incomes. The better access provided by the rehabili-
tated road in Yogyakarta and by construction of the road in Bengkulu opened up better opportunities for selling these products on a more regular basis. More buyers and intermediaries were now visiting the communities, enabling villagers to sell at a higher price.

The basic farm access roads provided under the TCSSP in Bengkulu were quite different from the asphalt road in Yogyakarta provided under the TLRP. These basic TCSSP roads seemed to serve an important function for the poor, which demonstrates how reliant they were upon intravillage travel over external travel. The roads were used primarily to access farmland, and they were inaccessible to all but the most determined motorized vehicles. For poor villagers who had traditionally been employed in portering crops from the fields to the roadhead, the better farm roads significantly improved their income-earning opportunities. Previously, they would have to carry paddy and other crops on their backs, which was very difficult and tiring. Now, they could use handcarts to transport the crops, carry more with less effort, and make more trips. They now also had more time and energy to do other things (Main Text, Box 6). However, the improved access and better opportunities for income earning through this activity led to an increase in competition among laborers for this kind of work. They could now use handcarts to transport goods along these access roads to the main roadhead. This means that there were improved opportunities too for intermediaries and traders to recruit labor to bring in produce from the field even during harvest times, which was previously impossible to do (Box A6.2).

** Provision of Transport Services **

The availability and frequency of transport services in both the Bengkulu and Yogyakarta study areas increased. In Yogyakarta, there was also a significant reduction in transport prices for passengers, but this was less clear on the asphalt road in Bengkulu. One reason for this may be the proximity of the Yogyakarta project site to Yogyakarta proper; from the Bengkulu study site distances to major trading centers were much greater, and the potential for competition among operators was therefore reduced. The Yogyakarta study road was also more closely connected to the main network in the area. Nevertheless, improved services resulted in both areas because of the road improvements. Vehicle operators in Yogyakarta lost their monopoly position through the wider availability of services, but were

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** BOX A6.2 **

** A Small Trader—Bengkulu, Indonesia **

Mr. P is an intermediary who collects paddy, coffee, and rubber from farmers. He is the head of a family with five members. His business started 15 years ago. He does not have capital for the business, so he is very dependent on big traders (moneylenders) from outside the village. His bargaining position is very weak in negotiating crop prices, because he has to sell the crops to the moneylender. The family seems not to be very successful in the business. It has a simple house, but not as bad as the poorest families.

Mr. P said that both the main road and the farm road (Tree Crop Smallholder Sector Project [TCSSP] road) give benefits to him in managing the business. Before the TCSSP road was built, they had to carry the crops on their shoulders; this was expensive, tiring, and very slow. To collect 400 kilograms (kg) of crops, he needed 5 days. At harvest time, it was very difficult to find two or three workers, because most of them were more interested in doing harvest activity than in carrying crops. The main road before 1996 was not asphalted. Very few pickups came to the Village, and trucks were very rare. Mr. P sent the crops for selling to Bengkulu generally once a month in the dry season when the truck came, and did not do it for about 5 months in the rainy season. He temporarily stopped working as a trader in the rainy season, when he worked as a farmer. His monthly income during the dry season averaged Rp150,000, and in the rainy season, Rp90,000.

Since the farm road was built by the TCSSP, Mr. P has been able to bring crops by pull cart or bicycle. He can collect 500 kg of crops in 2 days. Real benefits for him are:

- the cost is 25% lower; and
- he can save time, because the work is quicker.

Since the main road was asphalted at the end of 1996, he has felt that there are no constraints on transportation. He can send the crops to Bengkulu every day if available. Normally he sends the crops for selling twice a week. He receives a monthly income of Rp650,000 (US$66.26). It is difficult for him to send crops more than eight times a month, because he is in competition with another trader from outside the village, and some new traders from the village have started in the same business.

The problem for Mr. P is lack of capital for extending his business. He gets his capital from a moneylender at 25% interest per month, and he has to sell the crops to the moneylender. He tried to borrow money from a formal bank, but was unsuccessful. The bank needed collateral and had difficult administration requirements. He buys paddy at Rp950 per kg from the farmers and sells it at Rp1,100 per kg to the moneylender. If the farmers sell to the market, the price is Rp1,000 per kg. Mr. P buys rubber from the farmers at Rp1,750 per kg and sells it at Rp1,950 per kg to the moneylender. If the farmers sell to the village cooperative, the price is Rp1,850 per kg.

Mr. P says that the present condition of both the main road and the farm road is good enough for his business. Both roads help him. Although he cannot improve his business to the level of the bigger traders, he thinks the business and his family income have been better since both roads were improved. His main constraint is lack of capital.
more than compensated. They could no longer run a completely full vehicle, but made more trips per day as a result of the better road, and their vehicle operating costs were significantly reduced because of the better road surface.

Evidence from the control area in Yogyakarta appears to confirm that transport providers gravitated toward areas with better roads, irrespective of the high agricultural potential of an area and the consequent high potential demand for their services. The income from other routes was better because the road was better; the risk to their vehicles was much higher on the bad roads. As a result, more inaccessible areas were left with infrequent service, usually run on a monopoly basis. Operators could charge what they liked, since they faced no competition. In the case of intermediaries buying agricultural produce, this also meant that they could largely dictate the prices at which they bought, as farmers had no option of selling in a wider market outside the community.

Access to Services for the Poor

Improved access to services was a critical nonmonetary impact for the poor in both study locations and was probably the major benefit to them from road improvements. Better access to services meant that the poor could travel outside to summon medical services in an emergency or transport the sick or injured to medical facilities more easily. It also meant that providers of state health, education, and extension services had improved mobility and could visit project areas more quickly and more regularly. Case study evidence from both locations shows clearly how improved access and mobility impacted on services in both communities.

The improved asphalt road to the study area in Bengkulu and the rehabilitated road in Yogyakarta ensured all-season access for teachers to the village. Previously, their visits were restricted by the rains and were dictated by the irregular timetables of the vans offering the only means of transport into the villages. Now, better transport services and better roads shortened their travel times and improved their attendance. District officials also reported that it was easier to monitor the provision of services in the field with better roads. The case study of Mr. M (Main Text, Box 12), the extension worker in Yogyakarta, shows how he was now able to meet 90% of his work targets, against only the 40% that he was able to complete before the road improvements. Mrs. C, the local nurse, also reported a qualitative shift in the level of service that she was able to provide to the community because of the better road (Main Text, Box 3). Officials reported higher motivation to do their jobs, and some were able to take up secondary occupations to supplement their incomes because of the time saving through better transport.

Long-Term Sustainability and Community Involvement in Roads

The TCSSP roads in Bengkulu were originally constructed through the active involvement of community members, and the farmers’ association continued to maintain the road for 2 years following construction. However, maintenance was neglected thereafter, as it was felt that no perceivable benefit would come to farmers because of the road, since the rubber trees grew and paddy could no longer be intercropped between them. The road consequently reverted to a footpath/track. At the Yogyakarta study site, the community had little involvement in the road project; all construction involved machinery and outside labor. The prospects for some community engagement in the maintenance of the road became slim.

Both control areas exhibited a great deal of potential for community engagement with the roads. Villagers in Bengkulu recognized that their lack of road access was a critical restraint to the socioeconomic development of the village; and in the Yogyakarta control area, villagers had been building and maintaining their own village roads for the previous 30 years. Community mobilization and involvement, therefore, did offer the prospect of devolved local management of the roads, enhanced community ownership, and better prospects for long-term sustainability of road investments through active community maintenance. For the poor, regular employment in road maintenance would offer an important supplementary source of income through which they could begin to diversify their livelihoods and attain greater economic security.

Negative Impacts

The improvement of roads encouraged overspeeding by motorists, and thus the number of accidents increased. Most were motorcycle accidents involving youth. Because young students had better access to and communication with others outside the village, they were also exposed to drugs and other vices. Robbery was also gradually becoming a problem. Like villagers and other motorists, criminal elements had access through these roads, which they could use for easy getaway.
APPENDIX 7

Case Study Details in the Philippines

Introduction

The two road projects selected as case studies were the Sorsogon Integrated Area Development Project (SIADP) and the Fifth Road Improvement Project (FRIP). The SIADP is an integrated area development project with a road component, while the FRIP is a road sector project.

Sorsogon Integrated Area Development Project

DESCRIPTION OF SIADP. The SIADP was located in Sorsogon Province, Bicol Region, one of the least developed regions in the Philippines, with widespread incidence of poverty covering 78.6% of its population at project approval in 1988. The project focus was on poverty reduction by generating employment and improving living standards of subsistence farmers and fishing communities. The project had five components:

- improvement and rehabilitation of 215 kilometers (km) of provincial and 94 km of farm-to-market roads;
- rehabilitation of 15 communal irrigation systems and construction of flood-control facilities;
- health services through schistosomiasis control and provision for water supply systems;
- support services for agriculture and fisheries, including abaca rehabilitation, plant nurseries, and artificial reefs; and
- project management and training.

The SIADP aimed to improve the level of accessibility of its areas, reduce the cost of transportation, and enhance the distribution and marketing of commodities and transport for people. The basic thrust of the project was to strengthen the productive capacity of the poorer population groups through eliminating major physical constraints and making basic social and economic services easily accessible to the population. The following criteria were used for prioritizing the road projects:

- access to high-density population centers,
- access to areas where project production programs were being implemented,
- transportation of products to markets, and
- access to agricultural and fisheries production areas.

The executing agencies and the subcomponents for which they were responsible were

- Department of Public Works and Highways for road improvement and rehabilitation and for flood control;
- National Irrigation Administration for the rehabilitation of communal irrigation systems;
- Department of Health, through its district office in Irosin, for schistosomiasis control;
- Department of Agriculture for abaca rehabilitation extension support and artificial reefs;
- Sorsogon Provincial Governor for domestic water supply; and
- Office of the Provincial Agriculturist for plant nursery establishment.

The SIADP was completed in December 1997.

SIADP SETTING. Sorsogon Province is at the southernmost tip of Luzon Island. A main road artery, the Maharlika Highway, enters the province from its northern neighbors and proceeds to the southeastern tip of the province, where ferry boats operate. Sorsogon occupies an area of 214,145 hectares (ha), largely of volcanic core interspersed with broad and level farmland. It has one city and 14 municipalities, 13 of which are along the coast. There is heavy rainfall from November to January and hardly any dry season. The 2000–2001 cropped area statistics for Sorsogon show that about 151,000 ha was planted to coconut, paddy, banana, root crops, maize, and other crops. However, despite a large cropped area, output for key crops fell short of the consumption levels in the area. About 75% of the total population (0.6 million) are in rural areas. The average annual per capita income of Sorsogon in 1997 stood at P18,032 (US$351.84), with a huge variance between the lowest average level (P3,546) and the highest average (P101,755). The poverty threshold in Sorsogon for the same year was P7,760 (US$151.42). The percentage of the population below the poverty threshold in the Bicol Region increased from 55.0% in 1997 to 62.2% in 2000, and Sorsogon experienced a similar pattern. The unemployment rate for Sorsogon in 2000–2001 was 18.2%.

School participation rates in Sorsogon were high at 97.7% and 70.7%, respectively, for the elementary and secondary levels. Generally, the health situation improved in

1 Loan 915-PHI(SF) for $24.1 million, approved on 3 November 1988.
2 Loan 1058-PHI for $150 million, approved on 29 November 1990.
4 This compares with P 8,319 (US$162.32) for the entire Bicol Region.
terms of infant and child (<5 years old) mortality rates between 1993 and 1998. About 1% of the population in 2001 was diagnosed as suffering from severe malnutrition, an improvement over 3% in 1990. The better health status of the people in the area could be attributed to improved health facilities. Inadequate transport facilities such as roads and bridges to connect production centers to markets remained one of the major constraints in the overall development of the province. The current state of roads varied considerably from very good to very bad condition, with most in bad condition. The province had approximately 1,429 km of roads. The number of vehicles registered in the province increased from 7,470 in 1997 to 10,707 in 1999. The selected Bulan-Magallanes Road connects two urban centers and the municipalities of Bulan and Magallanes.5

Description of the Study Areas in Sorsogon
The Bulan-Magallanes Road was one of 15 road projects under the SIADP in Sorsogon. Selection of the project sites for this study was based on a variety of factors such as the representativeness of the project area, existence of rural poor, security concerns, and availability of local enumerators (Appendix 1). Barangays Palale and Bical of Bulan Municipality were selected as the project and control areas, respectively.

BULAN-MAGALLANES ROAD, SORSOGON. The Asian Development Bank (ADB) supported the rehabilitation of 21.12 km out of 26.77 km of total road length from Magallanes to Bulan, as the stretch between Bulan and San Francisco was already paved. Before rehabilitation, the road was motorable for a stretch of 8.6 km from Magallanes to Siuton during the dry season. At the other end, the road was passable from Bulan town to Barangay Cadandanan, a stretch of 9.4 km. Between these points, before rehabilitation, the road was impassable to motor vehicles throughout the year. In 2002, the Bulan-Magallanes Road had a 10-km concrete section from Bulan to Barangay Palale and carried largely local traffic. It had steep grades and sharp curves along its mountainous section and flat sections at either end of the road segment, with rolling hills in between. The road followed the ridge alignment. Therefore, the numbers of cross drainage structures were only few, and there were almost no retaining walls. There were six bridges with a span of 15–25 meters (m). The side slopes of the road were fully covered by vegetation; therefore, no soil erosion was noticed. The quality of the study road was still good, with the road surface still holding, 7 years after reconstruction, despite heavy seasonal rainfall. The low volume of traffic and good quality of graveling could be the reasons. It seems that the road was rehabilitated at high cost and overdesigned for the level of traffic. With the shoulders of the road not filled, there was a significant risk of road accidents. After ADB-funded graveling work, the local government funded the paving of the road, part double lane and part single lane. The rigid pavement was appropriate for tricycles (motorcycles with sidecars). As a result, the majority of the tricycles operated on both sections that were paved with reinforced concrete.

SORSOGON PROJECT SITE. Barangay Palale is approximately 10 km north of Bulan Municipality and has one administrative sitio6 called Patag. The main market centers of this village are either Barangay San Francisco or Bulan town. It has a total land area of 726 ha and a population of 96 households. Palale is highly dependent on copra production and its price. Copra is produced in six cycles spread over the year. The steep decline in copra prices between 1997 and 2000 resulted in widespread impoverishment and difficulties for the locals. The previously existing abaca production had ended due to disease. The government was encouraging a new crop (pili nut) to minimize overdependence on coconut. There was an elementary school in Palale, but the roof leaked severely during rains. Although Palale had a level 2 water supply (tap in the village), about 20–30 households were facing difficulties in accessing water. The village had no market. There were only two small convenience (sari-sari) stores, carrying mainly the basic food requirements of the households in the village. Villagers had all-weather access along the Bulan-Magallanes Road. The barangay road leading to sitio Patag was no longer passable by motorized vehicles. Farmers in the village had to transport produce from Patag either manually or by a buffalo (carabao) to the roadhead. Most tenant farmers were obliged to sell their copra to their landowners, who gave them credit in times of need. Even others who did not have this arrangement still found it hard to sell copra in the “open” market, as the local trade was controlled by a small number of copra dealers.7 The ability, then, of local tenant farmers to take advantage of any potential increase in opportunity for trade was severely restricted by the manner in which they were locked into local relationships, primarily of debt.

5 Municipalities in the Philippines are not necessarily confined to urban areas.
6 A part of a barangay.
7 In addition to the indebtedness, the lack of drying and storage facilities also affected the price that farmers could demand.
SORSOGON CONTROL SITE. Barangay Bical is one of the most inaccessible settlements of Bulan Municipality. Village access is via tracks to the roadhead, about a 40-minute walk. From the roadhead, tricycles can be caught to the main Bulan-Magallanes Road. As a conflict-torn area, Bical had not historically received many government services. However, in December 2001, the village received electricity, and there was an ongoing road-opening project in the area during the field visit. Only 14 households had electric connections, as access was beyond the means of most. Like Palale, the village economy depended heavily on coconut production. The village had a total land area of 455 ha, a population of 96 households, and an elementary school. The water supply was level 1 (open source, spring, or river). There were only a few middle traders at the road junction. But most farmers continued to Bulan or San Francisco to market their goods. The dealer in San Francisco bought a large portion of copra from the area. The village had no public market. There were only two small sari-sari stores carrying basic food requirements of the households.

Fifth Road Improvement Project

DESCRIPTION OF FRIP. The FRIP was approved in 1990. Its objectives were to improve the project roads to an economically maintained condition, reduce transport efficiency and accessibility constraints, and assist the government in improving road maintenance. The FRIP comprised

- civil works for improvement of about 420 km of national roads and 420 km of rural roads in 11 provinces,
- periodic maintenance of both rural roads in the same 11 provinces,
- consulting services, and
- a project benefit monitoring and evaluation study for the Third Road Improvement Project.

The executing agencies were the Department of Public Works and Highways for the national road component and the Department of Interior and Local Government for the rural road component.

FRIP SETTING. From the 11 provinces covered under the FRIP, Negros Occidental was selected for the case study. It is located in the northwest portion of Negros Island within the Western Visayas Region. Negros Occidental has a total land area of 792,607 ha. It has two pronounced seasons, the wet (June–October) and the dry. Sugarcane is the major crop of the province, occupying 49% of the cropland area, followed by paddy at 28%. The minor crops are maize, coconut, banana, cassava, and mango. The province had a population of 2.5 million and was expected to reach 2.8 million in 2002, with 52% living in rural areas. Population density was 284 persons per square kilometer in 1990 and was expected to reach 361 in 2002. The national road junction (NRJ) Moises Padilla-Guinpana-an Road Project in Moises Padilla Municipality was selected as the study road. Its level 3 water system could serve only 7 of its 15 barangays throughout the year, all situated in the town area. Other barangays were mainly dependent on deep and artesian wells for their water supply. The predominant dialects of the area are Hiligaynon, Cebuano, and Caray-a.

Description of the Study Areas in Negros

MOISES PADILLA–GUINPANA-AN ROAD, NEGROS. The Moises Padilla-Guinpana-an Road, the study road, is approximately 80 km south of Bacolod City, situated in Moises Padilla Municipality. It begins at an NRJ, proceeds northeast, passing three barangays, and links to Canla-on City. This road is paved and is about 13.5 km long. Terrain along the road is varied, with flatlands at the junction, becoming rolling hills, and then becoming mountainous near the end. The road project, which was formulated in consultation with the municipality, followed economic and sociopolitical criteria set out in the FRIP guidelines. The Department of Interior and Local Government implemented the project with the assistance of the Project Engineer’s Office. Barangay officials of Magallon Cadre, the study area, were not involved during the formulation of the project, reflecting a top-down planning approach. The quality of the project road was still good 6 years after rehabilitation. The road was underdesigned for the current traffic load and volume. It had a good supply of transport vehicles for the local needs of villagers in Barangay Magallon Cadre, especially tricycles, as it was between two markets. There was high connectivity of barangay roads to the main roads, but these were in poor condition. The rehabilitation equipment included bulldozers, road rollers, dump trucks, and graders. All bituminous works were also carried out by capital-intensive technology.

NEGROS PROJECT SITE. From the three barangays along the NRJ Moises Padilla-Guinpana-an Road, Barangay Magallon Cadre was selected as the study area. It is located 3 km from Moises Padilla and 86 km from Bacolod City. The
village is composed of seven sitios. The Intiguivan River cuts across the village and is being tapped for irrigation purposes. The local economy is highly dependent on the sugar industry: sugarcane plantations (haciendas) dominate the landscape of the village. Magallon Cadre had a total land area of 2,490 ha and a population of 616 households. Of its total land area, about 52% was planted to sugarcane, followed by paddy (27%). Social structures such as school, playground, and houses covered 11%, and cash crops and trees 10%. The concentration of land ownership was particularly acute. Most of the inhabitants in the project site were employed in the haciendas of large landowners, and most of the villagers themselves had no land. Even the lands for settlements along the road belonged to the haciendas. Residents were therefore required to work in the hacienda system for wage labor at peak periods in the agricultural season. Since they had no land and few other productive assets with which to diversify livelihoods, they became locked into a continuing relationship with the hacienda. Since haciendas were the primary source of employment for the villagers, the majority of the workforce were sugarcane workers. A daycare center, two kindergartens, and an elementary school were available to the villagers. A barangay health center provided mainly maternal and child care services. The village had no public market, but there were about 20 small sari-sari stores to cater to the basic requirements of households. Despite ready access, only one third of all the households had electricity connections.

NEGROS CONTROL SITE. Barangay Macagahay was selected as the control area. Access to the village is through Barangay Montilla, another barangay of Moises Padilla Municipality. A 30-m wide river, the Binalbagan, separates the village from Barangay Montilla, forcing the villagers to take a boat or walk along a floating bamboo bridge to cross the river. After taking a boat, it took about a 30–45-minute walk to reach the village proper, while the other route over the floating bridge was another 20–30 minutes additional walk. Barangay Macagahay has seven sitios, a total land area of 2,742 ha, and a population of about 335 households. Settlements in Macagahay were sparsely distributed. About 83% of its total area was considered mountainous. During rains (typhoons), Barangay Macagahay was completely isolated, as it was extremely dangerous to travel because of the difficult terrain. Due to the absence of a road network, sugarcane was not grown in the village, and a considerable number of bamboo trees also matured without being harvested every year. The main production was staple crops: irrigated paddy (15 ha), rainfed paddy (40 ha), and maize (300 ha).

There was no public market in the village, the market center in Montilla being the nearest. Since the health center in the village had inadequate medicine supplies, villagers went to the adjoining village. Also, the two schools in the village had to merge classes due to lack of classrooms and teachers. Extension workers were rarely seen in the village due to considerable difficulty in reaching the area.

Transport Situation

SOROSOGON PROJECT SITE. The Bulan-Magallanes Road is passable throughout the year, with the majority of villagers claiming that the condition of the road was better than 5 years previously. Before the road rehabilitation, people also used to travel from Bulan to Magallanes or vice versa by banca (nonmotorized boat) as an alternative to using the road. People originating from impassable sections used to hike. Their freight was transported by carabao sledge and manual backloading. With the improvement of the quality of road, it was anticipated that motorized traffic would increase in volume. Similarly, the banca traffic would then be diverted to the road. The current volume of average daily traffic (Appendix 1, Table A1.1) shows a low volume. The existing projection on traffic data was not directly comparable with the 2002 data. Other routes that have opened up since then and the failure of abaca production and the poor copra market may have affected the expected traffic growth.

Only jeepneys and tricycles operated along the Bulan-Magallanes Road, with jeepneys servicing only part of the study road. There was no fixed time for jeepneys to operate, because they waited for about 30 passengers to enter. Tricycles waited for at least seven passengers for them to operate. The tricycles could carry up to 20 passengers (children) or the equivalent load of commodities. The frequency of tricycle trips was higher during morning and late afternoon, and very low during the rest of the day. Neither type of vehicle operated if they did not get a minimum number

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9 These data are not directly comparable to the cordon survey data generated in February 2002, as the locations of the previous traffic counts are unknown as well as the period over which they were taken. There is also evidence of significant seasonal fluctuations in the levels of traffic using the roads. During the fieldwork, the traffic counts were done from 8 a.m. to 4 p.m. instead of 6 a.m. to 6 p.m. as in the other study locations for security reasons. There were no market days during the 2-week study period.
of passengers or freight. However, there was unsatisfied demand during peak hours. The area generated a higher volume of trips during August to December, the harvest months. To meet demand, transport operators added more vehicles during the peak season. The tricycle fare from Palale to Bulan was ₱5 before the rehabilitation of the road but increased to ₱10 in 2002, about 6 years after the rehabilitation. Similarly, the jeepney fare of ₱4 increased to ₱8. The tariff rate did not increase in proportion to the price of gasoline and prices of other tricycle spare parts. This could be partly attributed to the level of competition among tricycle and jeepney operators. Before rehabilitation, only two or three tricycles were servicing road segments, afterwards there were about 15. However, the full savings in vehicle operating costs (VOCs) were not transmitted to the passengers immediately.

Apparently, the availability of better road and transport services contributed to the commercialization of farm production in the village. Almost all of the households that farmed in the village sold their crops. Nevertheless, the majority maintained that they were selling a lower proportion of their produce now than 5 years previously. This implies that the presence of better road and transport services was not a sufficient condition for villagers to achieve higher farm productivity. They were selling their farm products at the market or to local merchants. Most claimed that there was no change in the number of agricultural buyers visiting their village compared with 5 years before. The declining pattern may have been because some producers were taking their produce directly to the market and partly because of the declining market for copra. The villagers’ preferred mode of transporting products to market was tricycle.

All travel movements near and within the village were by foot except for visiting a local healer or a health facility, when adult women used a shared taxi. Adult men traveled predominantly locally to visit fields for crop production, to collect water and fuelwood, and to process agricultural products. The adult women’s local travel was for buying provisions for their family’s daily needs, securing medical assistance, and maintaining good relationships with relatives and friends. Almost all of the travel movements of villagers outside the village were done by shared tricycle. Adult men traveled mainly for processing agricultural products, selling their harvest and other products, and securing documents from the state office. Adult women traveled primarily for buying provisions for their family’s needs and securing medical assistance from sources outside the village. Some adult women traveled outside their village for business or employment purposes. Male and female children traveled outside the village by shared taxi mainly for attending school on weekdays.

There appeared to be no difference in purpose of travel within the village among the different socioeconomic groups, but the mode of travel was different. The poor and very poor traveled on foot, whereas the better off used a tricycle sometimes, saving time on routine tasks. Outside the village, the very poor and poor traveled primarily to buy provisions, while the better-off households traveled for processing and marketing agricultural products. Overall, the adult men undertook productive tasks related to income-generating activities, while the adult women did household tasks except for the few who engaged in business/employment. The area had a mobile shopping facility that vendors visited once a week to sell food necessities to the poor. There was also a local government mobile clinic along the Bulan-Magallanes Road to provide emergency medicines and treatment for common illnesses. The villagers benefited from the easy access to this, and from the lower cost of medicine due to savings in transport cost. Better roads and more available transport services increased the mobility of teachers, health workers, and extension workers, allowing them to provide services to the villagers. It also enabled provincial health, education, and agriculture officials to monitor the quality of service delivery in a more time-efficient way. Likewise, better road and transport services greatly contributed to the sociopolitical participation of villagers, with high voter turnout in the 2001 local elections.

If inflation for tricycles and withdrawal of the gas subsidy were factored into prevailing tricycle tariff rate, the fare should have reached more than ₱14 for tricycles; the jeepney fare should have been more than ₱11 in 2002.
There was no organized transport association for operators along this route. Three institutions were directly involved in regulating and licensing the operation of transport services: Issuance of vehicle registration and licenses was the responsibility of the Land Transportation Office. The Land Transportation Franchising and Regulatory Board administered the franchising of routes. For jeepneys, the process involved a court hearing and payment of an application fee of about P3,000. Jeepneys could operate up to 65 km. The license to operate tricycles was administered by the concerned municipality. The Provincial Engineer’s Office maintained the road because it was categorized as a provincial road. It sent a maintenance crew with the required construction equipment. Therefore, there was no employment-generation opportunity. The majority of villagers were not prepared to contribute to the future maintenance of the road, but those who were willing preferred to contribute their labor. National and local authorities felt that the rural road projects should be integrated with other economic activities. Better extension services and a program of skills development could have been initiated to create an entrepreneurial environment.

**SORSOGON CONTROL SITE.** The only village access was via tracks to the roadhead of about a 40-minute walk across two rivers. Bical villagers carried medical patients in an abaca stretcher to the nearest road to be transported to the clinic or hospital. Consequently, home births were common. Despite the absence of better road and transport services, agricultural production in the village was commercialized. All the farming households claimed that they were selling almost the same percentage of their produce as 5 years previously, but most said more agricultural buyers visited their village compared with 5 years before. As most farming households had difficulty in transporting their produce, they sold it at lower prices to agricultural buyers visiting their village. Those selling directly to the market transported their products on foot or by animal.

Within the village household, daily travel activities were all done on foot, similar to Palale. Responsibilities for transport were also similar. The shared tricycle was the most common mode of transport for activities outside the village. In addition, villagers also transported their agricultural products to the market on carts drawn by carabao. Because of the lack of road access, villagers spent much time moving from one place to another to carry out their activities. On average, villagers spent about 2 hours to accomplish a task involving travel outside the village covering a distance of about 20 km. As in Palale, there seemed to be no difference in travel within the village among very poor, poor, and better-off households. The purposes for travel across socioeconomic groups were also similar to Palale, as were gender differences in transport responsibilities. The very poor and poor households traveled on foot due to their lack of access to animals. They spent more time reaching the roadhead compared with the better off. This substantially reduced the time that very poor and poor households could spend on productive activities, adversely affecting their income-earning capacity. In the 2001 local elections, voter turnout was high. A majority of villagers were willing to contribute to the maintenance of a future road through provision of labor.

**NEGROS PROJECT SITE.** Magallon Cadre is strategically located along the NRJ Moises Padilla-Guinpana-an Road, the study road. Travel in and out the village was fast and easy, with all-weather access due to the better road and better transport facilities available to the villagers. But the village roads leading to its different sitios were in a bad condition. Transport availability was not significantly affected by changes in season, as several alternative means were available. It was better than 5 years previously. The average daily traffic passing through the study road substantially increased from about 300 vehicles in 1990 to nearly 1,000 in 2002. All types of vehicles were seen on this road such as buses, minibuses, jeepneys, automobiles, tricycles, trucks, tractors, and motorcycles (Appendix 1, Table A1.1). After the project, the frequency of transport services increased considerably. Motorcycles became the most used mode of transport, followed by tricycles. Trucks were used mainly for transporting sugarcane. The volume of traffic was high in comparison with the Bulan-Magallanes Road in Sorsogon. Most of the motorized vehicles originated from Bacolod City, and the road appeared to be playing the role of a national highway, acting as a better route connecting Bacolod City to San Carlos City and La Castellana to Canla-on City, as the direct route to these cities was in poor condition. Therefore, the vehicle operators preferred to take long detours to avoid poor roads. Only three 60-seater buses used to operate between Bacolod City and Moises Padilla, passing through the study road before its rehabilitation. They left in the morning and returned in the afternoon. At present, Ceres Liner plied the Bacolod to Canla-on City route every half an hour with reasonably large and comfortable buses. Other minibuses operated every half hour from Cabacungan to Bacolod and vice versa. This meant that long-distance transport services were available every
There was a reduction in VOCs after rehabilitation of the study road. However, the nominal tariff rate for passengers did not decrease after rehabilitation of the road, but the real rate did. The bus fare for the Bacolod-Cabacungan section increased from P35 (before rehabilitation) to P40 in 2002 (6 years after rehabilitation). According to government norms, a transport vendor could raise fares up to P0.90 per km for a passenger; this meant the bus operators could collect up to P85 per person for a road length of 94 km from Bacolod to Cabacungan. But they were charging only P40. Therefore, the savings in the transport costs were being passed on to the passengers. It appeared that the availability of better road and transport services contributed to the commercialization of farm production in Magallon Cadre. All farming households sold some of their agricultural production. The majority of farming households were selling a higher percentage of their produce than before, and they had more buyers visiting the village now than 5 years previously. About 82% of respondents using transport services said they were good, and a further 4% reported them as fairly good.

Most villagers bought their household provisions and agricultural inputs from the public market center in the town of Moises Padilla and also sold agricultural products in this market. They normally used the medical facility available in the town. A minor health treatment facility was available in the village itself. There were employment opportunities, though limited, in the town. Since Magallon Cadre had only an elementary and intermediate level educational facility, high school or secondary level students had to travel to the town. Beyond secondary level, the students had to travel to Bacolod City or another large city. Nevertheless, most of the transport demand of the local people was within the municipality, especially for the poor, and was met by an abundant supply of tricycles. Bacolod City served as the regional market center for business people, and the town of Moises Padilla served as the local market center.

The pattern of local household travel within Magallon Cadre showed that most households traveled on foot to perform their daily activities. The patterns of household travel outside the village were also similar in responsibilities and tasks to those of Sorsogon. On average, outside travel of the villagers covered a distance of 5 km, requiring only 12 minutes. Moreover, the transport fares incurred in accomplishing such regular activities were relatively stable at P10 per round trip. Travel patterns by socioeconomic group were also similar to those of Sorsogon. Within the village, all groups had similar travel needs. However, most poor households who traveled outside the village restricted themselves primarily to buying provisions to meet subsistence needs, while the better-off households traveled for processing and marketing agricultural products to generate more income. As most of the poor households were situated far from the road, they had to spend considerable time to access the transport services along the road. As in Palale, better roads and more available transport services increased the mobility of teachers, health workers, and extension workers, allowing them to provide efficient and effective services. There was a high voter turnout in the 2001 local elections.

The Land Transportation Franchising and Regulatory Board has the authority to define the transport routes and the fare rates. The Franchise Office of Negros Occidental had determined the fare rate at P0.90 per km for buses. The Land Transportation Office undertakes the licensing of vehicle drivers and vehicle registration. The local municipal government administers the licensing of tricycles. The registration fee for a tricycle was P300. The issue of traffic accidents fell under the jurisdiction of the traffic police. In addition to the formal regulations, the large transport operators like Ceres Liner had developed their own policies on the number and frequency of services according to the transport demand. The United Negros Drivers and Operators Center also made decisions on the queuing system. Since this was classified as a provincial road, the Project Engineer’s Office undertook routine and periodic maintenance work. The maintenance activities generated limited employment for the local people. Considering the volume of traffic it handled, this road functioned as a national road. Maintenance will be a problem for the continuing operation of the road in the near future, as it was not designed for the heavy traffic and vehicles carrying loads weighing 20 metric tons or more. Surface deformations were already visible in a number of locations along the study road. Understandably, villagers were not willing to participate in the maintenance of a road that was used mainly by outsiders.

NEGROS CONTROL SITE. Although Barangay Macagahay had no road access, it appeared that this was not a major constraint in the commercialization of agricultural production. Farmers were selling a higher percentage of their produce than 5 years previously. They were selling their farm products primarily to visiting buyers in the village, because most of them had difficulty in transporting the products to the markets. Most of the villagers who were selling directly in the market were transporting their products manually; upon reaching the roadhead, they reloaded the products in tricycles or in buses/jeepneys or used an animal for the rest of the journey to the market. The village local government recently acquired a truck of 3.5 tons capacity for villagers to market their agricultural products upon reaching Barangay Montilla and to reach Moises Padilla at subsidized rates. This provided an opportunity to the poor to be hired as porters of agricultural products from the village to Barangay Montilla. They were usually paid P10/sack of 25...
kilograms of charcoal, banana, camote, or cassava, and P10 per bamboo pole.

There was minimal travel movement of households outside the village. No one traveled outside the village to process agricultural products, to transact business, for employment, or to attend classes. Minibus was the preferred mode of transport of most households in the village upon reaching Barangay Montilla after walking for 30 minutes to 1 hour. Adult men traveled outside their village to buy provisions for their family and to sell harvests or other products. Adult men and adult women traveled together to procure and secure medical needs of their family and documents at the municipal office. On average, one had to travel about 25 km and spend 2.3 hours to perform a task in the town. Since traveling outside the village was very costly, involving an average expense of P32 for each return trip, villagers scheduled trips outside their area only once every 2 months. However, a lack of transport services did not constrain the villagers from participating in the 2001 local elections with a high voter turnout. Most villagers were not prepared to contribute to maintenance.

Poverty Situation

Common Characteristics

The poverty situation was severe in all sites. The community classification of socioeconomic groups is shown in Appendix 3 in tabular form. The very poor households were generally in a chronic state of deprivation, mainly landless, and highly dependent on wage labor, with no regular employment. The poor had some livelihood potential, depended on wage labor, but had regularity of employment due to long service to landowners in their village. Within this group of households, there was great variation, from those who were perilously close to chronic poverty to those with a degree of security and the potential for accumulation and development. Better-off households were those that had accumulated significant capital, a high degree of land ownership, and access to income and employment opportunities outside the locale. The majority of households had been resident in the village for more than 5 years. Others were usually among the poor in the village, because they were more vulnerable to shocks, not having established a strong social network within the community.

The average village household size was about six members, with poor households usually having more children, typical of most rural villages. In addition, households with a high number of dependents such as school-age children, the elderly, and handicapped members were usually the poor and very poor as well. About 5% of households had female household heads, families belonging to the very poor or poor groups. They were either single parents or widows with six or more dependents. The average education of household heads and spouses was 5–6 years (except 3 years in the Negros control site). The very poor and poor households were usually those with heads who had a low level of education; they had little understanding of new farming technologies, or they found it difficult to get nonfarming employment. Laborers were subject to the seasonality of production. With no regular income, they had no opportunity to accumulate savings to invest in more profitable activities that better road and transport services might offer.

Most farming households claimed that there were no changes in size of farm area, or in the amounts and types of crops that they had been growing over the previous 5 years. In general among all socioeconomic groups, about half of the household income was spent on food, about 6% on transport, and 6% on education. However, the very poor and poor households spent at least 65% of their income on food, which could go up to 80% in the control areas, where scarcity of opportunities was higher. This prevented them from building up their financial capital to invest in productive endeavors. Most villagers claimed that there had been no change in their income sources over the previous 5 years. They wished to increase their income through raising animals or starting a small business. However, this opportunity was beyond the reach of the very poor and most of the poor households in the village, as the initial capital required was high for animal raising. Without access to credit, they could not find the start-up capital. Most of the very poor households mainly raised chickens instead for an emergency such as school fees or medical treatment. Considering all members of the households, a great number of villagers (over 80%) never worked away from the village despite the improved road and transport services. Those with an opportunity to work outside the village were those with adequate education and skills and were mainly from better-off households. Opportunities that existed were mainly for temporary/seasonal work (over 70%), either in urban areas or in a rural zone in the same district. Opportunities for temporary work outside the village were biased against women.

Most floors of the poor houses in the village were made of packed clay or dirt; the houses had bamboo walls and
thatch roofs. In the Negros control site, even raised floors were made of bamboo, as there was an abundance of bamboo in the village that was not marketed due to problems of transportation. As the poor did not have enough money for food, they had few savings or little money for the improvement of their houses. Most households had invested in hand tools, as they were dependent on agriculture, but the poor usually had fewer such tools. Only the better off had electric connections, while the very poor and poor had mostly kerosene lanterns for lighting their houses. A majority of the households (about 70%) in the project sites got their drinking water from protected sources in the village, while most of the very poor usually got it from unprotected sources, since they were located away from the village center. But in the control sites, there were only a few protected sources. Most of the very poor households had no toilet facilities and used open fields. Many of the very poor and poor households sought medical treatment from the village health post clinic and traditional healers, while the better off went to hospitals. A high percentage (80%) of the households experienced food scarcity ranging from 1 to 2 months, but the very poor faced up to 6 months of food scarcity. During months of scarcity, they got credit from store owners and sought extra work. During these periods, they depended primarily on root crops for subsistence. Over the previous 5 years, most of the villagers claimed that their food scarcity had not reduced. Due to food shortages, very poor and poor households usually resorted to slash-and-burn farming.

Sorsogon Project Site
In Barangay Palale, the villagers classified the socioeconomic groups as very poor (10%), poor (60%), and better off (30%). The primary occupation was agricultural wage laborer (50%) for most households, and others (26%) were coconut farmers. As harvesters and processors of copra, laborers worked for a daily wage rate (₱100 or US$1.95 per day). The 2-month cycle of copra created an income gap for very poor and poor households. A high percentage of average household income of villagers was spent on food (54%); very poor and poor households spent at least 65%. About half the households (57%) had private latrines, but most of the very poor households had no toilet facilities and used open fields.

Most of the farming households were tenants farming over 1 ha of land and growing coconut. Farming households had sufficient family labor and did not need to hire, resulting in even fewer opportunities for the very poor. Banana and some root crops were also grown. There had been no changes in farm size nor in the amount of crops that they had produced over the previous 5 years. This had negative implications on the earnings capacity of the very poor and poor as well. As little capital was flowing into the local economy, the poor were forced to engage in highly labor-intensive businesses to earn a little, e.g., selling bananas or sand from the river. In addition, the very poor collected and sold firewood, a tedious task. Despite the presence of the

Greater Market Access Scheme van along the road in the village (a government-supported program to sell staples at subsidized rates including rice, eggs, and sugar), the poor and very poor were unable to maximize the impact of these services, as they had limited money to buy adequate amounts of food for their needs with cash. By self-assessment, half of the households considered themselves having the same quality of life as their neighbors (49%); 29% considered their quality of life as worse than their neighbors; and 20% felt they were better off.

Sorsogon Control Site
The poverty situation in Barangay Bical was more severe than in Barangay Palale. In Bical, the residents considered 10%, 70%, and 20% as being very poor, poor, and better off, respectively. In Bical, similar to Palale, agricultural wage laboring (66%) was the primary occupation, but in contrast, the primary occupation of the spouses of household heads was not farming but also working as a wage laborer. This was an indication that poverty was more intense in Bical, with more households not having a regular income stream. As their mobility was highly confined in the village, the very poor and poor had difficulty in scouting for job opportunities that might improve their income capacity. The farmers generally cultivated over 1 ha of land under a sharecropping arrangement with the owners. In contrast to Palale, the majority of the households in Bical collected forest products for sale. The primary forest products were traditional plants. The abundance of these forest products helped the very poor and poor households in bridging the gaps in their income due to seasonality of copra production. But high transport costs were constraining them from selling more forest products. There had been no change in access to common land for grazing animals or collecting forest products compared with 5 years before. With 5–6 days of continuous rains, Bical floods. This had a serious impact upon the poor, who lacked the safety nets and security assets to recover quickly. As the very poor and poor were paid on a daily basis, they did not earn during natural calamities. The severity of the situation depended on the duration of the calamity. To attend classes, high school children had to walk across the flooded river, change, and proceed to their school. Much less capital was flowing in Bical than in Palale, resulting in an acute lack of capital for villagers to engage in business. Most (63%) of the poor households considered themselves as having the same quality of life as that of their neighbors, while the rest claimed they were worse off (23%) or better off (15%).

Negros Project Site
In Barangay Magallon Cadre, the poverty incidence was high. Villagers considered a high percentage of households as poor and very poor (60%); the better off were thought to be 35%, and the rich 5%. The poor in the village were those households that had difficulty in meeting even their daily food requirements. They were usually landless and
worked as unskilled labor in the plantations. The better off were skilled workers (drivers, mechanics, carpenters), tenant farmers, those in business, and fixed-income professionals. The rich were big landowners who owned 80% of the agricultural land of the village, 65% of which was planted to sugarcane. As the local economy was dependent on sugarcane plantations, livelihood and employment opportunities in the village were very limited and seasonal. Only during the peak season (October to February) were all workers in haciendas employed. During the off season, the poor had practically no source of income other than the haciendas.

Villagers’ primary occupation was agricultural wage laboring (48%) and farming (22%). There were not many alternative employment opportunities except for a few variety stores. The absence of microenterprises in the area was due mainly to the villagers’ lack of capital, credit history, and collateral. Several informal credit schemes were available (even prior to the road improvement) for villagers to start a microenterprise, but these were not easily available to poor households in times of emergencies. There was more participation in the credit schemes after the road rehabilitation. Most of the target clients were poor paddy farmers, who had high repayment rates as they had the flexibility to pay in cash or in kind. Variety stores provided informal credit to the poor during hard times. Wage rates for hacienda workers in the village were very low (males from P70/day to P100/day [US$1.37–$1.95] and females P60/day [US$1.17]). The poor did not seek jobs outside the hacienda, because their exposure was limited to working in haciendas. Unless they developed other skills, they could not take advantage of the transport services to seek employment elsewhere. They usually had no savings at all to utilize while looking for other opportunities. Because of the labor surplus in the village, poor households made themselves always available for work in the haciendas; otherwise they would be replaced.

Most poor households experienced food scarcities, especially in August. This coincided with the milling season, when there was no demand for labor in the haciendas, and with the heavy rains in the area. Some cut down on food expenses by just having coffee during breakfast, bread and coffee during lunchtime, and rice during dinner. Farming households mostly farmed not more than 1 ha of land, and most of them were tenants. Although sugarcane plantations dominated the landscape of Magallon Cadre, the majority of households ranked paddy as their most important crop. These farming households seldom hired the services of the poor households in the village, as they had enough family labor for their farm requirements. The majority of the households (68%) considered themselves as having the same quality of life as their neighbors; 22% considered themselves worse off, and 10% better off.

Negros Control Site
The impoverishment of Barangay Macagahay was due mostly to the inaccessibility of the area. Although the economy was diverse, its development was highly constrained by low agricultural productivity of staple crops such as maize and paddy due to difficulty in transporting farm inputs such as seeds and fertilizers, and considerable difficulty in marketing agricultural products such as bananas, bamboo poles, and farm animals. Villagers classified households in their area as very poor (20%), poor (70%), or better off (10%). The very poor households were landless, had no regular jobs or were even totally jobless, and had household heads with no formal education. The poor households had access to land, where they planted mostly staple crops, and were mainly self-employed. The better off were professionals who settled in the village due to their work assignment, and those owning agricultural land.

Due to the absence of access roads, villagers had considerable difficulty in traveling during the rainy season, as it is slippery terrain with flash floods. Farm products perish when they are not transported during the rainy season. Farming (46%), followed by agricultural wage laboring (39%), was the primary occupation of most members of the households. Despite inaccessibility, agricultural buyers came to the area, as they could buy livestock and other agricultural products about 10–20% cheaper than in Moises Padilla town. Most households in the village were dependent on farming, rather than on the agricultural wage labor market. They farmed less than 1 ha of land and were either owners or tenants. The majority of the households ranked maize as the most important crop for them, as it was their staple food. Banana was their next important crop, followed by root crops such as camote and cassava. In par-

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12 The socioeconomic classification in Magallon Cadre was slightly different because of the agro-industrialization in the area. There was a large wage-labor base providing services to absentee landowners for sugar production. The main socioeconomic difference identified by villagers was, therefore, between those who labored (and thus fell into the categories of poor and very poor), those who had some alternative source of income (the better off), and the landowning rich. Within the category of the poor were included those who, in other study areas, had been identified as the poor and very poor.
ticular, most of the very poor households survived day to day by just having root crops for breakfast and lunch. Most had a full meal only for dinner: steam-milled maize with dried fish or fish paste, or even just salt.

Unlike Magallon Cadre, a relatively larger number of households (38%) collected forest products—mainly charcoal and bamboo—and sold these in the markets or to neighbors. Usually, only very poor and poor households collected forest products, as it is time consuming. At the village, they sold charcoal at P25–P30 per sack and bamboo poles at P20–P25 per piece. To this price, they just added the porter charges of P10 per sack and per piece for buyers in Montilla. Most households in the village did not wish to sell more animals and forest products, particularly bamboo, as they had considerable difficulty in transporting the products to the market. The majority of the households (70%) considered themselves as having the same quality of life as that of their neighbors, while the rest felt worse off (22%) or better off (8%).

**Transport Impacts and Linkages to Poverty**

Beyond ensuring basic access, transport was a low priority for the very poor. Much of their travel was localized, for productive or subsistence purposes. In particular, they had little capital to set up small businesses or any income-generating activity along the road to take advantage of transport services. Even for long-term residents who might have the potential to slowly graduate from poverty, significant restraints existed. For small tenant farmers of copra, for example, conditions of tenancy included selling the copra to the landowner at a predetermined price. The potential for making use of better transport links to explore wider markets was, therefore, irrelevant. Very poor and poor households used jeepneys rather than tricycles, since they were cheaper. As a consequence, they spent more time in traveling, which prevented them from engaging in other activities from which they could earn income.

After the rehabilitation of the study road, there was some outmigration evident from Barangay Palale to urban centers. There was also outmigration from Bical, but at a lower rate. However, there is no necessary link between graduation from poverty and migration for employment, unless this temporary migration is sufficiently secure and regular to replace the existing income and subsistence function from agriculture. The opportunity to get well-paid and regular work outside the community is often closed to the very poor, who lack the access to information and social networks to be able to take advantage of these opportunities. The road project substantially influenced the setting up of roadside businesses, especially in the Negros project site. Small vending stalls (particularly for fish) and variety stores along the road offered an opportunity as main and supplementary sources of income for the poor and a possibility for them to move from poverty status to being better off.

Based on the overall perception of the villagers in the study areas, the positive impacts of improvements to roads as ranked in order of importance were

- availability of more transport,
- cheaper transport and better road surface, and
- increased opportunities to sell things.

The negative impacts of making improvements to the roads were ranked as

- increased dust and noise pollution, and
- outside interests buying up land and resources.

There was no significant movement away from poverty, although marginally the project sites had less poverty than the control sites in both the study areas, even with the existence of good quality roads and transport services. Household income and consumption levels remained low and in some cases were not sufficient for their basic needs. This was evident in the continuing high incidence of household poverty in the study areas: 70% for Barangay Palale and 60% for Barangay Magallon Cadre. With no direct access to a road, the incidence of household poverty in the control areas was 85% for Bical and 90% for Macagahay. As construction/rehabilitation of the road project relied upon machinery and outside contractors, there was little involvement of the poor in the road projects. There were few opportunities for the villagers, particularly the poor in the study area, to supplement their income by being involved either in the road construction phase or its subsequent maintenance work.

Lack of access to land remained a critical determinant of poverty in both study areas. Households that were unable to access regular income from agricultural production usually belonged to the very poor and poor categories as defined by the villagers themselves. Agriculture did not progress as expected, with the same traditional crops grown and the same cultural practices used despite the removal of major constraints to the flow of technology through the availability of good access roads and better quality transport services in the project areas. There were no innovations in primary production in either the coconut or sugar industries, as they remained vulnerable to market price fluctuations that put the locals at the mercy of external forces. Farming households in project sites had more direct access to markets and more contact with agricultural buyers due to the availability of better roads and transport services. They were no longer solely dependent on buyers coming into their area. On the other hand, there was no influx of other cash crops into the study areas, nor were the villagers practicing intercropping or multiple cropping for diversifying their activities and increasing their food options. It seems that the transfer of agricultural technology was lacking in both study areas. The livestock and poultry sectors were still backyard
operations. As a consequence, villagers in both study areas suffered from food deficits, as the quantity that they produced was less than that required by the households for food consumption.

Graduation from poor to nonpoor through migration might be possible only if outside employment is sufficiently secure and regular to replace the existing income and subsistence function from current livelihood activities. Based on the situation in the study areas, the opportunity to get well-paid and regular work outside the community is often closed to the very poor. Better roads and available transport services enhanced the delivery of various government services to the poor in the project areas. It also gave government officials the opportunity for timely and efficient monitoring of the progress of their programs for the poor. Thus, roads are critical as social arteries for the delivery of government services, penetration of ideas and cultures, and technology dissemination to poor people. The potential for using the roads to facilitate economic activity was evident in the project areas, but the poor were in need of financial assistance to start their own businesses like sari-sari stores along the road, which might enable them to emerge from poverty.