

ASIAN DEVELOPMENT BANK

IES: REG 2002-15

**IMPACT OF RURAL ROADS
ON
POVERTY REDUCTION:
A CASE STUDY-BASED ANALYSIS**

October 2002

ABBREVIATIONS

ADB	–	Asian Development Bank
DFID	–	Department for International Development
FRIP	–	Fifth Road Improvement Project
INO	–	Indonesia
km	–	kilometer
ha	–	hectare
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

NOTE

In this report, "\$" refers to US dollars.

CONTENTS

	Page
EXECUTIVE SUMMARY	ii
I. INTRODUCTION	1
A. Background	1
B. Study Objectives and Scope	2
C. Methodology	2
II. CASE STUDY PROJECTS AND SITES	4
A. Study Projects	4
B. Study Roads	5
C. Study Sites	6
III. UNDERSTANDING POVERTY	8
A. Who Are the Poor?	8
B. Key Poverty Themes Common to All Study Locations	9
IV. CONSIDERATIONS FOR PROJECT DESIGN AND IMPLEMENTATION	11
A. Considerations for Project Design	11
B. Considerations for Project Implementation	14
V. KEY IMPACTS AND RELATED ISSUES	16
A. Changes in Transportation Services	16
B. Changes in Travel Patterns	20
C. Changes in Village Profile	22
D. Changes in Income and Welfare	27
VI. CONCLUSIONS AND RECOMMENDATIONS	33
A. Study Conclusions	33
B. Recommendations for Strengthening Poverty Reduction Impacts	35
APPENDIXES	
1. Methodology Details	38
2. Sample Framework for Documenting Field Research	47
3. Poverty Details	50
4. Study Roads, Project Sites, and Control Sites	59
5. Case Study Details in the Philippines	65
6. Case Study Details in Sri Lanka	80
7. Case Study Details in Indonesia	96
8. Household Case Studies from Along the Project Roads	108

EXECUTIVE SUMMARY

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 (ADB) operations, the study addresses this void. The objective of the study is to improve the design of rural road components to achieve sustainable benefits for the poor. Realizing that pragmatic recommendations need to capture the real-life impediments that often plague project design assumptions, the study focuses narrowly and deeply on selected case study villages within a project area. This enables an understanding of the factors that influence impacts on poverty.

Rather than relying on income poverty line definitions, the study analyzes poverty as a multidimensional concept. It adopts an assets-based approach to understanding poverty, where poverty is defined as a deprivation in assets and entitlements essential to life, and a susceptibility to periodic physical and economic shocks, and seasonal crises. The study compares project sites with control sites and uses a variety of tools to gather relevant qualitative and quantitative data and to validate findings.

Undoubtedly, in all case study projects, the poor and very poor benefited substantially from social impacts of rural roads through access to state services in areas such as health, education, agricultural extension, and provision of information. Improved rural roads create the conditions for better access of people to services, and of services to the village. Roads allow regular contact with the outside world and bring remote areas within the purview of the state and other networks. Such improvements reduce the perception of isolation and remoteness among the poor and very poor. These social impacts could not be quantified rigorously due to the lack of baseline socioeconomic data and periodic monitoring.

Benefit monitoring and evaluation systems were part of the ADB design of most study projects, but were exclusively the responsibility of the executing agencies, which were often expected to meet the cost 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. 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 shows that the context within which economic impacts take place was often determined by conditions such as climate, agricultural potential, spatial position and proximity to networks, and world market commodity prices, as well as 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 a better assessment of 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 socioeconomic 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. Besides, the poor lack both time and energy; and impacts that either reduce or exacerbate these deficiencies have a critical bearing on poverty. The poor rely on the primary network of paths, tracks, culverts, and basic access routes in the immediate village vicinity. Theirs is a village, walking world, and improvements to this primary village network that reduce the burden in undertaking 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 their well-beings than improved availability of motorized transport services, which they do not or cannot afford to use, and which are not linked to their existing livelihood strategies. Therefore, improving transport within a village is as important to the poor and very poor as providing access to markets outside the village.

The rural roads studied have provided an important economic safety net allowing alternative livelihood opportunities. Such an alternative income stream, even if temporary or seasonal, is still important for household food security. A good road surface and the guarantee of all-year accessibility are important prerequisites for the development of any kind of regular enterprise. With increased opportunities for mobility, however, there are also increased risks of exposure to negative influences from nearby urban centers such as drugs and sex trade.

In the study areas, the relationship between rural road investments, spontaneous private sector transport provision, and availability of cheaper transport services relied heavily on the competitiveness of the transport markets. Reductions in the vehicle operating costs were evident, but passing these on to consumers depended on the level of competition and contextual factors. Rural roads, by definition, often serve remote areas where population density is low, and market information imperfect. In the absence of competition, there is no incentive for transport providers to improve their service or pass on their cost savings to consumers.

Competition is determined by potential demand for travel, users' proximity to a commercial center, the government's commitment to regular maintenance, and regulatory barriers. Rural roads, particularly gravel roads, quickly deteriorate if not regularly maintained, and benefits can be quickly lost if they are periodically impassable or the overall condition is bad. Competition then is minimal as transport providers gravitate toward areas with better roads. 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.

Problems of maintenance are compounded when it is unclear where the institutional responsibility for rural roads lies. Regular maintenance is often neglected both because of lack of funds and because there is little political capital in carrying out minor maintenance; major rehabilitations would be authorized once the road has deteriorated very much, making it difficult to maintain a guaranteed level of access. Devolving responsibility for rural road maintenance to local communities supported by the technical expertise of local authorities yields direct employment benefits, builds ownership among local communities, and promotes sustainability.

One very important way in which the poor can feel the direct economic benefits of rural roads is through labor-based road construction and maintenance. Unfortunately, only one project out of the six studied had a labor-based road component. Some authorities in the study countries appear to believe that labor-based construction methods are slow and their quality doubtful. But for low-traffic 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. Experience from Asia and Africa shows that, given a sufficiently long period of employment on the road, the poor can escape chronic debt cycles and thus move away from poverty.

Vehicle operators and traders are often winners with both good and bad rural roads. They can monopolize transport routes and the buyers' markets along poor roads where competition is weak, and thus dictate prices. They also benefit from better roads through lower vehicle operating costs, time savings, as well as easier transportation and higher volumes. Often, indebtedness of the poor allows traders to dictate prices even in the midst of competition.

They are chronically indebted to these traders, and so have little scope for maneuver in deciding whom they sell to and at what price. Better access does not necessarily lead to better prices for poor farmers.

A traditional assumption on the mobility of the poor is that their lack of agricultural assets, particularly land, makes them more likely to seek employment outside the community and that road access helps this substantially. 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, while the poor and very poor access only temporary, seasonal, and unskilled work opportunities, which are usually poorly paid. Lack of education and lack of support networks in more urban areas compound this trend.

Roads are clearly a critical enabling condition for improvement of living conditions in rural areas. However, the distribution of economic benefits is a separate issue, and there are no guarantees or inherent mechanisms to ensure that economic benefits will be distributed equitably between the poor and 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 projects that were 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. In order for the poor to travel for productive purposes, the provision of transport services must be linked to some livelihood and income diversification activity, which 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 roads projects is difficult and the contextual situation differs from place to place. ADB may suggest to borrowers to take on partners in program design and implementation such as other cooperating external assistance agencies, or local or international nongovernment organizations that have a proven track record in mobilizing and working closely with communities.

In addition to the recommendations above, the study provides a range of other recommendations regarding project design (on participatory design and planning, and poverty assessment), as well as implementation (working with partners and project performance monitoring). It also acknowledges that governments have a critical role in this endeavor such as facilitating a regulatory environment for competitive transport services and participatory selection of roads to be improved, and promoting understanding of the priority of poverty reduction among its agencies.

I. INTRODUCTION

A. Background

1. **Need.** Although it is widely assumed that investments in rural roads reduce poverty, there is little systematic analysis or evidence to date either of the ways in which rural roads actually impact on the poor or of what the impact process is. Designs of 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 its adoption of the poverty reduction strategy, ADB is carrying out much research and analysis into the poverty dimensions of its operations. Poverty reduction has become a much more explicit imperative, and this is reflected to some extent in recent proposals for infrastructure investments.¹ It is now increasingly recognized, however, that there are also other indirect impacts from road investments that may have either a positive or negative effect on poverty reduction. To date, it has been difficult empirically to capture evidence of these indirect benefits in a systematic way. This study attempts to address this void through the collection of empirical evidence from a cluster of case studies drawn from past ADB operations. It is primarily intended to address two questions: (i) How do rural roads help reduce poverty? And (ii) How can rural road projects be designed to help reduce poverty more?

2. **Focus.** The study was initiated in response to requests from ADB staff to better understand what the impact of rural road investments was on poverty reduction. It was developed as a retrospective study that assessed the impacts of past road investment.² It did not have the luxury of identifying, monitoring, and comparing impacts before, during, and after the road investment.³ However, it had the advantage of in-depth fieldwork in a variety of case study villages and systematic analysis of both quantitative and qualitative data collected and verified through an array of tools. It focused particularly on poverty and transport linkages that stem from rural road investments, rather than on the overall impacts of these roads on the rural economy and the distribution of impacts across different segments of society. It is expected that lessons learned and discussed here will increase understanding and strengthen the effectiveness of poverty reduction of future ADB operations, especially those concerned with rural roads and transportation.

3. **Structure.** The case studies selected are sufficiently varied and the methodology adopted is effective to give a range of useful lessons. The report is structured to allow future designers and implementers of road development projects to grasp the key issues that are relevant at different stages in the project cycle and to understand the extent to which outcomes/impacts may be affected by contextual factors. Chapter I details the background for the study and summarizes its methodological approach. More details on methodological approach are given in Appendix 1 for the benefit of evaluators and other researchers. Chapter II gives a brief introduction to the projects and case study contextual scenarios. Chapter III presents the study's approach to defining poverty and factors that influence poverty in the case study areas. These two chapters give real-life considerations that may shape the assumptions that have traditionally been made about the impact of rural roads on poverty reduction. Chapter IV, based on study findings, indicates what is important to consider when designing and

¹ Loan 1385-CAM: *Rural Infrastructure Improvement Project*, for \$25.1 million, approved on 28 September 1995, and still under implementation, has been an early attempt to incorporate poverty dimensions in infrastructure projects.

² The study team comprised H. Hettige (Senior Evaluation Specialist and Study Manager), P. Chaudhry (International Social Development Specialist), and three country-specific specialists on poverty and transport, namely G. Bimbao (Philippines), N. Gunetilleke (Sri Lanka), and A. Rohandi (Indonesia), who were supported by groups of enumerators in each of the study areas.

³ Studies of this nature are under way (e.g., Van de Walle. 1999. *Choosing Rural Road Investments to Help Reduce Poverty*. World Bank. Washington, DC that describes the initial stages of the study).

implementing rural road projects. Chapter V is devoted to a discussion of those key impacts that may occur immediately following a road improvement project and those that may take time. Issues that emerge from these impacts then lead to the conclusions and recommendations in chapter VI. Details on each of these chapters, individual household case studies, and selected photographs are presented in the appendixes.

B. Study Objectives and Scope

4. **Objectives and Scope.** The study is limited in its objectives. It focuses only on rural roads and on how they relate to poverty reduction. Urban roads and road networks are taken as a given in the study. The study's overall objective is 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 direction: (i) What are the different kinds of impacts that rural roads have on poverty? (ii) How can we effectively capture the factors that lead to these impacts? And (iii) What types of complementary services and considerations are essential to accelerate the beneficial impacts of rural roads to the poor? The study findings are intended to complement and add value to existing knowledge and work being undertaken.⁴

5. **Case Study Approach.** The study uses past ADB road improvement project components⁵ to understand and capture the impacts of rural roads on poverty reduction. 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, does not attempt to evaluate these ADB project investments. Instead, it consciously adopts 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. In order to better design future projects, the opportunity to understand the underlying factors and thereby 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.

C. Methodology

6. **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 the several methodological assumptions that broadened its sphere of inquiry.⁶ It did not assume an automatic link between rural roads and poverty reduction, but considered the multifaceted impacts that determine how people respond to improved rural roads and shape livelihood constraints and opportunities. It questioned whether rural roads would automatically lead to better rural transport. It accepted that poverty is

⁴ In particular, the ongoing work under TA 5947-REG: *Assessing the Impact of Transport and Energy Infrastructure on Poverty Reduction*, for \$800,000, approved on 25 October 2000, which has a wider scope and covers the impact of infrastructure investments (several types of transport infrastructure and energy) on poverty reduction.

⁵ The projects considered in the study were components of broader transport sector projects or integrated rural development projects.

⁶ Appendix 1 describes in detail the evaluation approach used, methodological assumptions, and project selection criteria.

a multidimensional condition, and that lack of income is only one component. It focused on both physical and nonphysical accessibility constraints that the poor may have, and reviewed both direct impacts that are often felt immediately and indirect impacts that 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 structure that captures not only the outcomes of the project intervention but also the factors that affected the impacts.⁷ The use of different tools ensured effective cross-checking and validation through the triangulation of findings⁸ for study robustness.

7. **Case Study Selection.**⁹ Based on discussion 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 driven 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.¹⁰ 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, 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 during this process, as the study focus was the impact of roads on poverty reduction.¹¹

8. **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 projects under consideration had already experienced the rural road intervention, it was not possible to use an experimental design technique where control groups were 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 technique¹² could be used to attribute the impacts of the intervention (in this case a rural road).

⁷ A sample framework for documenting field research is given in Appendix 2.

⁸ Triangulation of findings 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.

⁹ Details on country, project, and case study area selection are presented in Appendix 1.

¹⁰ Since different countries adopt different definitions for rural roads, the study selected basic roads funded by ADB in predominantly rural areas.

¹¹ 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 the methodology workshop, and it was advised by the workshop participants that since the study focus was to understand how best rural roads projects can 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.

¹² The 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.

9. The two crucial ingredients needed for the double difference technique were 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.¹³ After surveying several road segments, the team selected areas that proved to be suitable control sites with minimum selection bias and that did not compromise the quality of findings. However, collection of baseline data on the preproject situation proved to be difficult and data collected were inadequate. Instead, recall techniques were tried in an attempt to compare before and after conditions in a qualitative sense. Even the recall techniques proved to be quite difficult to use in the 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.¹⁴ 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 the comparisons of "with" and "without project" situations to a certain extent.

II. CASE STUDY PROJECTS AND SITES

A. Study Projects

10. The objectives of the case study projects and the components that were designed to achieve these objectives are set out in Table 1.

Table 1: Project Objective and Components

Project Objectives Approval/Completion^a	Road Components	Other Components
<p>Sorsogon Integrated Area Development Project (SIADP)—Philippines (PHI) To reduce rural poverty in Sorsogon by increasing incomes, generating employment, and improving the standard of living of subsistence farmers and fisherfolk.</p> <p>Approval: 1988 Amount: \$24.1 million Completion: 1997; study road was rehabilitated and graveled in 1995 Study Area: Sorsogon</p>	<ul style="list-style-type: none"> ▪ Improvement and rehabilitation of 156 kilometer of national secondary and rural roads 	<ul style="list-style-type: none"> ▪ Rehabilitation of 15 communal irrigation schemes ▪ Provision of health and water supply facilities to control schistosomiasis ▪ Provision of plant nurseries, an abaca tissue culture laboratory, artificial reefs, and strengthening of extension services ▪ Project management support
<p>Fifth Road Improvement Project (FRIP)—PHI To reduce transport constraints, increase efficiency in transport services, and stimulate economic development.</p> <p>Approval: 1990 Amount: \$150 million Completion: 1997; study road was rehabilitated and asphalted in 1996 Study Area: Negros</p>	<ul style="list-style-type: none"> ▪ Improvement of national roads and rural roads in four islands ▪ Periodic maintenance of national roads and rural roads ▪ Procurement of road maintenance equipment ▪ Consulting services 	

^a Completion indicates the year in which the entire project operations were completed. The study road may have been rehabilitated prior to that.

¹³ Initially, the team had difficulties in identifying suitable control locations due to the high density of rural road networks, but subsequently this problem was solved. 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.

¹⁴ The importance of implementing baseline surveys and collection of socioeconomic monitoring data needs to be realized by all stakeholders if rigorous impact evaluations are to be carried out in the future.

Project Objectives	Road Components	Other Components
<p>North Western Province Water Resources Development Project (NWP-WRDP)—Sri Lanka (SRI) To improve the economic, social, and nutritional well-being of the people living in the rural areas of the province through increased agricultural production and crop diversification and employment opportunities.</p> <p>Approval: 1992 Amount: \$30 million Completion: 1999; study road was rehabilitated and graveled in 1998 Study Area: Kurunegala</p>	<ul style="list-style-type: none"> ▪ Rehabilitation and improvement of rural roads 	<ul style="list-style-type: none"> ▪ Rehabilitation, improvement, and restoration of minor irrigation systems ▪ Credit lines for on-farm irrigation systems and to rural women for establishing income-generating activities ▪ Institutional support through equipment, training, and consulting services
<p>Southern Provincial Roads Improvement Project (SPRIP)—SRI To raise the income and quality of life in the project area through creation of income-generating opportunities and strengthening of the economic and social infrastructure.</p> <p>Approval: 1997 Amount: \$30 million Completion: Still ongoing; study road was rehabilitated and asphalted in 2001 Study Area: Matara</p>	<ul style="list-style-type: none"> ▪ Civil works for road and bridge rehabilitation ▪ Capacity building, training, and provision of mobile road maintenance equipment, etc. ▪ Consulting services for project implementation 	
<p>Tree Crop Smallholder Sector Project (TCSSP)—Indonesia (INO) 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.</p> <p>Approval: 1991 Amount: \$135 million Completion: 2000; study (farm) road was constructed in 1993 and the district road was asphalted in 1996 Study Area: Bengkulu</p>	<ul style="list-style-type: none"> ▪ Construction of plantation roads 	<ul style="list-style-type: none"> ▪ Plantation establishment and maintenance ▪ Support services including project management ▪ Equipment, training, and consulting services
<p>Third Local Roads Project (TLRP)—INO To improve the road network in selected provinces and support periodic maintenance.</p> <p>Approval: 1993 Amount: \$200 million Completion: 1997; study road was asphalted in 1997 Study Area: Yogyakarta</p>	<ul style="list-style-type: none"> ▪ Rehabilitation of paved and unpaved roads ▪ Replacement of bridges ▪ Periodic maintenance ▪ Provision of road maintenance equipment and consulting services 	

Source: Asian Development Bank.

B. Study Roads

11. From each project, a study road was selected as a case study.¹⁵ These roads are broadly similar in that all are basic roads with seasonal and market day fluctuations in traffic volume, primarily serving 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 projects are all gravel surfaced and located in clearly rural areas. They primarily serve a farm-to-market purpose. Two of the roads (in Kurunegala, Sri Lanka and Bengkulu, Indonesia) can be considered basic access roads, as they serve 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

¹⁵ Appendix 4 briefly describes the road segments studied and compares the project sites and control sites.

are higher, and there is some evidence that two of them (in Negros, Philippines and Matara, Sri Lanka) are serving as bypasses for major traffic on the road network. All of the study road segments demonstrate, to different degrees, a mix of “traditional” nonmotorized and pedestrian traffic, and “modern” vehicular traffic. Table 2 summarizes the characteristics of these road segments and their transport conditions.

Table 2: Description of Case Study Roads and Their Impacts

Condition	Integrated Projects			Transport Sector Projects		
	Sorsogon	Kurunegala	Bengkulu ^a	Negros	Matara	Yogyakarta
Country	Philippines	Sri Lanka	Indonesia	Philippines	Sri Lanka	Indonesia
Rehabilitated	1995	1998	1993/1996	1996	2001	1997
Length (km)	21.0	16.5	4.0/16.0	13.5	10.5	10.5
From	Bulan	Ambale	Talang Padang	Moises Padilla	Urubokka	Semanu
To	Magallanes	Inginimitiya	Tanah Abang	Guinpana-an	Katuwana	Giri Panggung
Bypass	No	No	No	Yes	Yes	No
Surface	Gravel	Gravel	Gravel/Asphalt	Asphalt	Asphalt	Asphalt
Condition	Good	Good	Poor/Good	Good	Good	Good
Increase in Transport Volume	Moderate	Moderate	Little/Moderate	Heavy	Heavy	Heavy
Modes of Transport	3-Wheelers Jeepneys ^b Bicycles	Bicycles Bus Trucks	Wheelbarrow/ Trucks Bus	Motorcycles 3-Wheelers Bus/Trucks	Motorcycles Trucks Bus	Minibus 3-Wheelers Trucks
Competition in Transport Services	Not much	Not much	Not much	Competitive	Competitive	Competitive
Transport Price Reduction	Small	None ^c	Small	Moderate	Good	Moderate
Travel Time	Reduced	Reduced	Reduced	Reduced	Reduced	Reduced

km = kilometer.

^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. Their details are shown separately in one column.

^b Jeepneys are locally-made vehicles which are like minibuses.

^c Subsidized bus available before and after the road improvement.

Source: Study team.

C. Study Sites

12. Six project site locations were selected from along the project roads. Primary research activities were focused in these communities. Six control locations (similar to the project sites) were also selected for research; these were close to the study sites, but far from a motorable road. Table 3 describes the similarities in the project site and its corresponding control site and also contrasts their accessibility differences.¹⁶ Therefore, the control sites were well suited to compare the with and without project situations.

¹⁶ Brief descriptions of the project sites and control sites, as well as photographs of accessibility constraints to control sites, are in Appendix 4.

Table 3: Similarities and Differences Between Project Sites and Control Sites

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

FRIP = Fifth Road Improvement Project, INO = Indonesia, NWP-WRDP = North Western Province Water Resources Development Project, PHI = Philippines, SIADP = Sorsogon Integrated Area Development Project, SPRIP = Southern Provincial Roads Improvement Project, SRI = Sri Lanka, TCSSP = Tree Crop Smallholder Sector Project.

Study Area/Project	Project Site	Control Site
Yogyakarta/TLRP (INO) Main Production Land Ownership/Employment Accessibility	Candirejo Village Rice, cassava, groundnuts, banana Smallholders and laborers Study road runs through site	Sumber Wungu-Kelayu Rice, cassava, groundnuts, banana Smallholders and laborers 6 kilometers from asphalt road; walk on rocky paths to reach site
Total Households	385	149
Survey Respondents	40	39

TLRP = Third Local Roads Project.
Source: Study team.

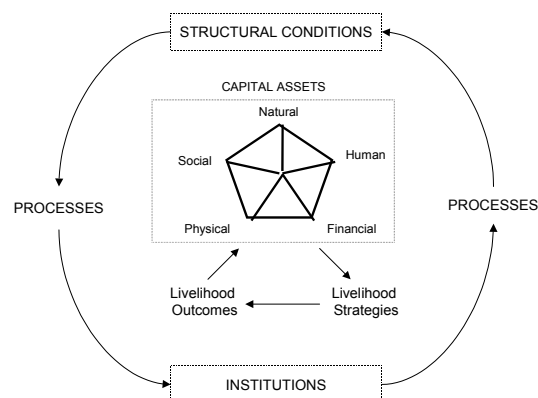
III. UNDERSTANDING POVERTY

13. This chapter briefly describes the concept of poverty used in the study. A detailed description is provided in Appendix 3. Case study findings were used to understand what poverty means across countries, within a country, across communities, and within a community. Despite this relative concept of poverty in the community, there are key poverty themes that were common to all locations and these are presented later in the chapter.

A. Who Are the Poor?

14. **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 seasonal crises. It also describes a state of voicelessness and an inability to influence the structures, institutions, and processes that shape rural livelihoods. Fieldwork revolved around the analysis of livelihoods through using a capital assets-based approach.¹⁷ It was assumed that people had five principal types of capital assets, and the relative strengths and weaknesses of these assets determined vulnerability, susceptibility to shocks, and ability to participate in wider institutions and processes. The relationship of the assets (physical, financial, natural, human, and social) to the institutions, structures, and processes at work is represented in Figure 1.

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



Source: Carney, Diana, ed. 1998. *Sustainable Rural Livelihoods: What Contribution Can We Make?* Department for International Development, United Kingdom.

15. **Poverty Groups.** The study does not rely on income poverty line definitions but analyzes poverty as a multidimensional concept.¹⁸ Poverty was defined by the communities themselves. Even within a country across communities, material designation of poverty can be very different.¹⁹ Therefore, the study sought to understand how communities themselves define and understand relative socioeconomic status. This relational approach was also intended to capture better some of the complexities and dynamisms of the broader aspects of vulnerability present in each community, which are of critical interest to the study in seeing what the necessary conditions are for the poor to make use of rural roads. Using PRA techniques in each location, the study captured how the villagers grouped themselves according to perceived

¹⁷ Carney, Diana, ed. 1998. *Sustainable Rural Livelihoods: What Contribution Can We Make?* Department for International Development, United Kingdom; and Hanmer, Lucia, Elizabeth Lovell, Robert Chapman, and Tom Slaymaker. 2000. *Poverty and Transport: A Toolkit*. Overseas Development Institute.

¹⁸ Therefore, the concept is not directly comparable with the income and headcount definition of poverty.

¹⁹ See examples from the Kurunegala and Matara sites in Appendix 3, para. 6.

poverty status. These classifications were compared with self-perception inquiries in the household survey and a poverty index built using information within the survey. All three sources (PRA classification, self-perception, poverty index) classified the socioeconomic groups into three distinct groups, and their approximate size was validated by all three exercises.

16. The socioeconomic groups were classified into the following three distinct groups (for details, see Table A3.2 in Appendix 3):

- (i) **The “structural” poor or very poor.** The members of this group face structural, long-term factors of lack of access and entitlements to land and resources, which severely restrict their ability to produce beyond subsistence levels. They are most susceptible to crises resulting from natural disasters, as they have a small asset base and few networks on which they can rely for support. Often, families with a high care factor (where members are elderly, sick, or disabled) are heavily represented in this category. In the six project sites and six control sites, the proportion of the very poor ranges from 10% to 40%.
- (ii) **The “transient” poor or poor.** This is a broad categorization covering a range of people who are extremely vulnerable to shocks and fall into “severe”²⁰ poverty at times, but who also have some asset base or entitlements, which gives them, potentially at least, the opportunity to move out of poverty. Many may slip into severe poverty through seasonal vulnerability. Others in the top end of this bracket are progressively securing themselves against poverty by building up their asset base. Depending on the site, the proportion of the poor is between 45% and 70%.
- (iii) **The better off.**²¹ These households have an income and assets beyond their subsistence needs and can 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 case study locations varies between 10% and 40%.

B. Key Poverty Themes Common to All Study Locations

17. Research activities in all study locations revealed a number of key common themes, which condition household susceptibility to poverty. These are summarized in the following sections.

1. Resource Endowments

18. **Land and Labor.** Across all communities, the ability to have rights over natural resources was critical in determining whether or not a household is poor. Without any form of land, it is clearly difficult for households to graduate from poverty, as they have no capital other than their labor nor any skills or education. Without land, most of the productive time is spent in wage labor to meet the subsistence needs of the household, and there are few opportunities to accumulate savings as rates for wage labor are at subsistence levels throughout the study locations. A lack of land also means that the poor and very 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 respondents²² in all case study areas (project and control sites),

²⁰ A state where households are forced to use what little assets they have to borrow in order to meet their immediate consumption needs.

²¹ The better off in the study communities are also not poor in a national sense (Appendix 3, para. 4).

²² The terminology “all survey respondents” is used to reflect all project and control site groups in all three countries.

26% of respondents do not farm any land whatsoever, either as owners or tenants, and most of those who do farm use extremely small plots of land that are barely sufficient to meet their needs.²³

19. **Livestock and Forest Products.** Animals are an important source of livelihood, as well as a source of security during emergencies in all of the project locations. Ownership of a few heads of small livestock is, therefore, a critical poverty indicator. For the very poor, forest products are also key assets because the very poor usually lack land on which to grow cash crops. These are gathered from vacant lands and forests and often require considerable time and effort for collection.

2. Debt Cycles

20. The level of household indebtedness is also a key poverty indicator. Many poorer farmers and wage laborers in the study communities are heavily reliant on credit extended by agricultural intermediaries and moneylenders in the community. During emergencies, tenants

Box 1: Gradual Emergence from Poverty

- Mr. Gripon's case study in Sorsogon illustrates that it takes a long-term secure livelihood opportunity and commercialization of the economy for families to move out of poverty. A rural road is a necessary condition for this process, but not a sufficient one (Appendix 8, Box 12).

and poor farmers borrow money against the next season's crop, which enables the intermediaries to dictate the price at which this debt is relieved. Often, debt cannot be fully paid from one crop. In this way, tenants and poor farmers are locked into relationships of debt. Those

dependent on wage labor also get credit from large landowners to overcome periodic food shortfalls. This ensures a labor obligation at predetermined rates when landlords most need it during peak harvest times. Formal credit sources have numerous requirements usually too onerous for the poor to meet and are often located outside the village, making it difficult for the poor and very poor to access.

3. Family and Community

21. **Household Size and Composition.** In all of the study locations, there appears to be a high correlation between large family size and poverty. Whether having a large number of children is a symptom or cause of poverty is a moot point, but 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.

22. **Social Networks and Length of Residence.** Close relationships of family and kinship groups are features of rural societies throughout Asia, and all of the study locations clearly show how important, complex, and dense these networks can be. 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.²⁴ Length of residence enables family groups to build up relationships of trust and mutuality with neighbors. Length of residence across a number of generations, combined with available family labor, would appear to be a successful remedy in enabling the family to move out of poverty. Using multidimensional poverty, which captures access to social networks, becomes important in this context.

²³ See Appendix 3, para. 13 for charts and a description of farming activities and size of landholdings.

²⁴ In many of the study locations, extended families would live 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.

IV. CONSIDERATIONS FOR PROJECT DESIGN AND IMPLEMENTATION

A. Considerations for Project Design

23. 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 different conditions that are conducive or not conducive to poverty reduction through rural road improvement. A careful consideration of these conditions could yield a checklist that could be used 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 below using site-specific examples. Although the conditions described here are not applicable to all sites, by using these specific examples the study tries to illustrate the key factors that may 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.

1. External Conditions that Cannot be Affected by Road Development

24. **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 below) and the availability of extension services, for example. But a core necessity is a climate and natural resource base that has the potential to support increased and intensified agricultural activity.

25. The Kurunegala project site shows how villagers' ability to make use of a better road is conditioned by wider climatic conditions such as the 3-year drought that has crippled the village's rice production (Appendix 6, para. 7). This has affected both landowners and wage laborers who work in the fields. In another project site in Yogyakarta, 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 would be difficult (Appendix 7, para. 11). Consequently, despite the incentives provided by better roads, these climatic and natural resource conditions limit the ability of some areas to respond.

26. **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), 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), 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.

27. **Macroeconomic Context and Terms of Trade.** Many of the study locations are heavily reliant on a single cash crop. In Sorsogon, it is copra, in Negros sugarcane, in Matara tea, and in Bengkulu rubber. Fluctuations in the world market prices of these commodities have an

enormous impact on the well-being of all socioeconomic groups in the study communities, as all groups are tied into the commodity economy through sale or labor. Where crop prices are good or increasing, significant benefits accrue from road improvement and resulting marketing opportunities (tea in Matara [Appendix 6, para. 38]). But a slump in world market prices creates a significant downturn in a village economy (copra in Sorsogon [Appendix 5, para. 9]). 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 [Appendix 7, para. 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.

28. The world market drives many commodity prices. Persistent difficulties experienced by the study communities producing cash crops in the Philippines and Indonesia appear to support a contention that developing countries are increasingly subject to fluctuating terms of trade in agricultural products. This has led to what has been described as a process of “deagrarianization,” a fundamental change in the nature of rural economies in the face of a slump in the terms of trade, with nonagrarian, nonfarm employment becoming increasingly important in sustaining rural livelihoods.²⁵ Some of these issues are returned to in the following sections with a detailed discussion of the evidence from the case studies of increased outmigration (para. 70) and employment. Mobility, particularly for the young, appears to be increasingly important in this context.

2. Structural Conditions that Cannot be Affected by Road Development

29. **Social Structure and Concentration of Assets.** The prevailing social structure and concentration of productive assets have an enormous bearing on determining how impacts occur in each of the study locations. The concentration and distribution of land is particularly important, and largely outside the area of influence of a road project.²⁶ Nevertheless, 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.

30. In the Sorsogon case study area, land ownership is heavily concentrated among a small number of owners (Appendix 5, para. 9). Many are absentee owners residing outside the village, with longstanding relationships with tenants who farm the land. Often, tenants are required to sell the crop (copra) to the landlord, at a predetermined price. In exchange, they receive credit facilities throughout the year against the next crop. Similarly in Bengkulu, intermediaries

Box 2: The Very Poor Unable to Use the Better Road to Overcome Their Poverty Status

- Mr. Grita’s family in Sorsogon is landless and lives on encroached land on the study road. He works about 4 days a month as a laborer when he can find work. The family experiences acute food deficits. They worry about sickness and damage to their small house. They recognize that more transport services are available but only use them intermittently when they have money to buy essentials (Appendix 8, Box 1).
- Mr. Olarte’s family in Negros lives in a hut on the study road on a land owned by a plantation (hacienda). The family has work during the planting and harvesting seasons and at other times experiences a food scarcity. They depend on remittances from two children who have migrated and store credit during slack times. They usually walk to work and only use the road to buy provisions when they have money (Appendix 8, Box 2).
- Mrs. Nandawatie and her family in Kurunegala are very poor and rely on labor opportunities that her husband can find and the garden that she cultivates. She sells the vegetables in the village and her husband uses the bicycle to search for work. They acknowledge that some goods are cheaper since the road improvement. She uses the road to buy essentials or to go to the hospital (Appendix 8, Box 4).

²⁵ Bryceson, D., C. Kay, and J. Mooij. 2000. *Disappearing Peasantries? Rural Labor in Africa, Asia and Latin America*. IT Publications.

²⁶ The study roads were mainly road improvement and, therefore, no land acquisition or resettlement was involved.

(*tokeh*) and traders effectively control market exchange in paddy and rubber with relationships of debt. It is increasingly difficult to escape from these relationships as indebtedness rises (Appendix 7, para. 17). In Negros, the concentration of land ownership is particularly heavy in the haciendas²⁷ where a majority of project site inhabitants live. Most villagers have no land at all, and the residents are required to work in the hacienda when seasonal labor is needed (Appendix 5, para. 39). The situation in Matara is slightly different because the level of land ownership is less concentrated, but landholdings are small and the poor particularly are required to work in the tea plantations throughout the year, limiting their opportunities for exploring more lucrative livelihood alternatives (Appendix 6, para. 32). Many are, therefore, locked into these long-term working relationships, which result from the prevailing norms in social relations, economic exchange, and ownership of productive assets.

31. 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 the road may bring.

3. Conditions that Can be Affected by Road Development

32. 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

Box 3: The Very Poor Using the Road to Improve Their Livelihood

- Mrs. Tumilah in Yogyakarta is a very poor widow with children. She works 2–3 days a week as a laborer when she can find work. She sometimes collects firewood that she can find from vacant lands to sell. She has benefited somewhat from the road as she does not find it difficult to sell the firewood because more intermediaries come along the road to buy it. During road rehabilitation, she was refused work. She uses the road to do her weekly marketing (Appendix 8, Box 3).

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, 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.

33. Access to health facilities 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. 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 access transport needs may be different for different socioeconomic groups. The poor lack time and energy. Impacts, which either reduce or exacerbate this time and energy deficiency, have a critical bearing on poverty. Better-off groups who have time, energy, and capital may have a better opportunity to expand their livelihood opportunities and welfare. Women and men may have different transport needs, and an analysis of intra-household 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 nonphysical barriers to using some types of transport (i.e., bicycle) or to travel alone outside the household or community.

²⁷ Large estates or plantations.

34. During the project design, these different socioeconomic groups and possible outcomes, as well as gender aspects, need to be recognized, with a particular focus on how they will impact on 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 that 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 V under Key Impacts and Issues and, therefore, the outcomes are only listed here:

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

B. Considerations for Project Implementation

35. 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.

1. Labor-Based Techniques and Poverty Reduction Option

36. One aspect of rural road development, which 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 that were explicitly selected for the works. 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 under the survey, 97% were not employed on the road in any way and 2% were engaged for 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 cited 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, a majority were casual laborers during rehabilitation work. Because of the short nature of the work opportunity, the wages were primarily used to meet household food deficits (70% of responses). Others paid off debts or bought household items.

37. 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 their paid employment in carrying out physical works.²⁸ 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 underemployment 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

²⁸ Loan 1385-CAM: *Rural Infrastructure Improvement Project* (footnote 1) is successfully using a labor-based construction method.

the study countries, when questioned on this point, indicated that labor-based construction methods are slow and that the quality of works 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 works can be at least as good as that of contractors using machinery.²⁹ A strategy using paid labor for most tasks, and machinery for compacting, might be a suitable compromise for gravel road reconstruction in rural locations.

2. Governance Issues Surrounding Rural Roads

38. **Roads as Political Capital.** Roads play 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 are heavily influenced by the prevailing political context. This is 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 road rehabilitation schemes. The ability to do this successfully appears to depend heavily on the level of political influence communities can exert. As a result, decisions about road rehabilitation, maintenance, and the prioritization of work are 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.

39. **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,³⁰ 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 authorize 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 prevails 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.

40. **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) over 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 were rehabilitating 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

²⁹ It may be useful to increase the awareness of success of labor-based road construction and maintenance through workshops or study tours.

³⁰ See Operations Evaluation Department. ADB. 1998. *Special Evaluation Study on the Operation and Maintenance of Road Facilities and their Impact on Project Sustainability*. Manila.

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.

3. Community Participation as a Key to Long-Term Sustainability

41. 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 time 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, which they hardly use, or are unable to make use of. Community involvement should, therefore, mean more than labor contributions for the poor. They should be involved in the assessment of needs³¹ and decisions regarding maintenance and management.³² 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, which serve their needs.

42. Villagers throughout the control areas in the study recognize the importance of roads in bringing benefits to their communities. In the Yogyakarta control site, the villagers have maintained and managed resources for their own intra-village roads for the past 30 years (Appendix 7, para. 14). In the Bengkulu project site, the project road was originally constructed through the active involvement of community members, and the farmers' association maintained it for a few years and later neglected it, as the villagers felt that they were receiving no benefit from it (Appendix 4, para. 9). The road has consequently reverted to a footpath/track that still appears to meet their needs. Similarly, in Sorsogon, the level of access on a road (nonproject road) was more than required. The villagers felt that they were neglecting other livelihood activities by maintaining the road regularly and stopped maintenance (Appendix 5, para. 9). 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 be prepared to contribute. 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.

V. KEY IMPACTS AND RELATED ISSUES

A. Changes in Transportation Services

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

³¹ The needs of the poor need not be confined to roads and can include tracks, culverts, crossings, and improvements to intermediary modes of transport.

³² Decisions regarding engineering specifications will have to be sought from technical experts in any case.

1. Transport Modes, Volume, Cost, and Competition³³

44. A widespread traditional assumption governing the development of rural roads is that investment in roads will spontaneously lead to private sector transport service provision and this, in turn, will lead fairly quickly to provision of cheaper and better transport services to everybody through competition. The case studies suggest that in all project sites, a variety of transport modes have emerged and travel time has substantially fallen. However, Table 2 shows that increases in transport volume and decreases in fares have occurred only when there is competition among transport providers. Competition is clearly the critical precondition for the development of better transport services. But the relationship between rural road investments, transport service development, and competition is not straightforward and an automatic link cannot be assumed. There are intervening factors and contextual barriers to this. Rural roads, by definition, often serve remote areas, where 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 pass on their cost savings to consumers.

2. Preconditions Necessary for the Emergence of Competition

45. All of the case studies witnessed an upturn 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 has been 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 now spend less money on maintenance of their vehicles, and are losing fewer days a month when their vehicles are being repaired. Whether these benefits are passed on to service users depends heavily on the level of competition that develops along the roads. For competition to emerge, certain preconditions must be present. This section discusses these preconditions.

46. **Demand.** Potential demand must be there from areas served by the rural road, both for commercial and personal travel. Potential demand is closely linked to population density and the agricultural potential of the area. Little competition among transport providers has emerged in the Kurunegala project site due to lack of demand caused by low production which, in turn, stems from a severe drought that has lasted 3 years. In contrast, in the other project site, Matara, competition is emerging rapidly, fueled by the better demand for green-leaf tea (Appendix 6).

47. **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 has reduced the VOCs for vehicle providers, more providers have been attracted to the route, and more competition and a variety of available transport services have resulted. Transport operators have had to reduce fares and no longer run full vehicles, but spend much less on vehicle maintenance, and are able to make more trips a day because of the better surface, thus earn a higher income. In contrast, the longer distances to markets and networks have kept competition weak from Bengkulu. Although the availability and frequency of transport services have increased in both the Bengkulu and Yogyakarta project sites, the transport prices have not fallen for the district asphalt road in Bengkulu.

48. **Maintenance.** Evidence from the control area in Yogyakarta also suggests the importance of road maintenance. It shows that high demand for services driven by the

³³ More information on these aspects is provided in Appendixes 5–7 on case study details in each country.

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 has agricultural marketing potential, but the road surface is very bad and, therefore, lacks 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.

49. **Regulatory Barriers.** The Kurunegala road shows another important factor. The existing regulatory environment for transport services in Sri Lanka makes it more difficult to operate a pick-up truck or van as a person carrier along the road. There is also a long tradition of provision of subsidized bus services by the state, 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 be other types of barriers. In the Sorsogon study area, there is no automatic direct link between improved roads, more transport services, and lower fares. The number of 3-wheelers plying the route from the study community to the nearby markets has increased somewhat since road rehabilitation. Many villagers now prefer 3-wheelers to jeepneys³⁴ which take longer to fill up. But the fare for 3-wheelers has not decreased markedly since road rehabilitation. The demand has, therefore, not been sufficient to force down transport prices or overcome price-fixing arrangements between operators.

50. Competition, and thus benefits for consumers (poor and nonpoor), appears to occur only once a threshold has been reached.³⁵ 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 will quickly revert to their previous condition and transport entrepreneurs will 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 “mafia” 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.

3. Who Provides Transport Services?

51. Having established the conditions for competition to emerge, the transport service providers and their socioeconomic status are discussed in this section, considering the relationship between 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 have fallen sufficiently to make the services affordable to them. Do the current 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?

³⁴ Jeepneys are locally-made vehicles which are like minibuses (Appendix 5).

³⁵ See summary traffic data in Appendix 1, Table A1.1.

52. Transport Providers. Vehicle operators are often winners with both good and bad rural roads: (i) they can monopolize transport routes along poor roads where competition is weak and dictate prices and the level of service; (ii) they also benefit from better roads through lower VOCs and reduced maintenance; and (iii) 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. In most sites, there are a few large vehicle operators on improved roads, but they are based in larger towns at either end of the road. Operators of smaller motorized vehicles, however, particularly 3-wheelers, are often based in the study communities. Owning and operating a 3-wheeler is a significant income-generating activity for better-off members who have the initial capital and sense of security to invest in a vehicle.

Box 4: Owner/Operators—Transport Providers

- Mr. Supardi has been a vehicle operator on the district study road in Bengkulu since 1993. Since road rehabilitation, he has saved considerably on vehicle operating costs and time spent on the job. His income has increased by 300% (Appendix 8, Box 14).
- Mr. Gnanatilake has been the sole truck operator on the Matara study road since 1994. Once, he spent his savings to repair sections of the road. Since the 2001 study road rehabilitation, he has invested in a minibus and has improved his income (Appendix 8, Box 15).
- Mr. Lalith is from a better-off family in the Kurunegala project site. Faced with a water crisis, he gave up paddy farming to provide transport services and used his savings to buy two vehicles that ply the study road. His income improved (Appendix 8, Box 16).

53. 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 were usually based in nearby town centers. They are also often transporters in their own

Box 5: Traders and Intermediaries

- Mr. Anwar is an intermediary in Bengkulu who depends on large outside traders for capital. With the road rehabilitation, he increased the volume of trading and his income increased, but he still finds it difficult to get capital at reasonable rates (Appendix 8, Box 18).
- Mr. Niran had left the study village in Bengkulu in 1993 but came back in 1996 after road rehabilitation. He rented a truck and became a trader and has now bought two vehicles and a rice miller for his growing business (Appendix 8, Box 19).

right, owning and operating a vehicle to conduct their business. Like transport providers, traders benefit both from poor and better rural roads. When the road is bad, they can often establish a monopoly position in buying primary products at the prices they 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. 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 (para. 20 and Appendix 7).

54. 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 intra-village travel over external travel, and nonmotorized over motorized transport means. In Bengkulu prior to the project, poor households were engaged in portage to bring in farm produce. The headloading was extremely hard. The work was exhausting and did not allow porters to carry out other

Box 6: A Very Poor Family of Porters

- Mrs. Kustina and her family live in the Bengkulu project site. They are very poor and landless, and work as porters. With the plantation road improvements, their portering has become easier, more income generating, and allows them more time for other activities. They do not prefer the road to be improved further as that would take away their main source of livelihood (Appendix 8, Box 5).

livelihood activities. Since the establishment of farm roads, however, the work has become easier with the ability to use handcarts. Very poor porters have increased their income and also engage in other activities such as basket weaving. The volume of produce moved has increased mainly because of the road. However, the poor in the village are ambivalent about improving the road further as it would enable vehicles to use it, thereby competing with their portering. These thoughts are echoed in control areas throughout the study countries where portering of produce is 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 7).

B. Changes in Travel Patterns

1. Modes of Transport of the Poor

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

56. Access to means of transport among those who are in the better-off category of survey respondents is, unsurprisingly, far better than among those who are poor or very poor. About 65% of the better off have a bicycle, against 35% of the poor and very poor. Twenty-five percent of better-off households own one or more scooters/motorcycles, against 4% of the very poor and 9% of the poor. Comparisons between the very poor, poor, and better off indicate that for crop processing, the percentages of each group traveling are 9%, 17%, and 24%, respectively. To sell crops, the percentages traveling are 20%, 16%, and 32%, respectively. In traveling for business or employment, the better off travel 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.

57. The responses to the question of whether the condition of the road had changed after rehabilitation were generally very positive (Table 4). Among all project respondents, 59% said that it was better than 5 years ago, although 24% disagreed. However, consciousness of the road and its importance seems to be much higher among the better off than the very poor and poor. Table 4 also shows that the better off are less likely to give a “don’t know” response, and more likely to give a positive response.

Table 4: Change in the Condition of the Road Over 5 Years (%)

Response	Socioeconomic Group			Total
	Better Off	Very Poor	Poor	
Don't know	3	9	9	8
Better now	71	53	58	59
Worse now	21	23	26	24
No change	5	15	7	9
	100	100	100	100

Source: Household survey data.

58. In looking at access to modes of transport, it is useful to consider the buying of provisions, which is a common task. Figure 2 shows the proportionate modes of transport for each group in the project site. The very poor are much more reliant on walking than the better off. The latter are more likely to have access to private motorized means (motorcycle or 3-wheeler) or to a car or van. Interestingly, the poor are more likely to use a bicycle, while bicycle usage among the very poor is 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.

Figure 2: Means of Transport Used for Buying Provisions (project sites)



2. The Importance of Roads to the Poor

59. Through the improvement of road surface and provision of all-year access, the six projects studied have allowed better modes of transportation, reduced travel time, and at times, even the travel costs, thereby bringing benefits to those who travel outside the community and its vicinity. PRAs indicate that the poor and very poor inhabit a localized village, walking world, and as such make little use of medium- or long-distance transportation links. Of more importance to them are 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 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 the 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 generate small savings to explore opportunities outside the village.

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

61. Inside the community, the survey shows that women are 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 are 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 are more likely to travel for crop processing (53% to women's 14%, with 17% shared) and social travel within the village is largely shared. In travel outside the community, these patterns are broadly replicated. Outside the village as well, women are more responsible for buying provisions and traveling for health reasons, while men travel outside for employment, crop processing, and selling their produce. Survey returns also show that, for various tasks, men are broadly more likely to have access to private means of transport like a bicycle, 3-wheeler, or motorcycle. Women are more likely to travel on foot to fulfill tasks, or use a public form of transport, like a bus or truck. The opportunities for men to travel outside the village and to take up outside opportunities are reinforced and perpetuated by traditional gender roles in the study sites, with women responsible for household tasks and men for productive or economic tasks.

C. Changes in Village Profile

1. Community Well-Being and Development

62. The study looked both at project and control sites to understand what the impact has been of road rehabilitation 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) are highly evident when project villages are compared to control villages.³⁶ Average travel time taken is often half or less for project households than 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 have 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 are and how often they travel outside their village, respondents in project sites and control sites had different priorities (Table 5). Control households travel more frequently for crop processing and for selling their produce than project households. This suggests that (i) primary agricultural activities are more important in the control areas, which may lack alternative livelihood opportunities; and (ii) due to better access, many of the services that come directly to the project site are 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 are important. Project sites have a wider variety of services (e.g., crop processing) available within the village, and are also accessed more regularly by buyers, meaning that primary producers are less likely to have to travel outside the community to sell their produce.

³⁶ The selected project and control areas are similar in their socioeconomic characteristics except for the road and, in broad terms, the level of development in the study and control communities prior to the project was similar (Appendix 1).

Table 5: Travel Patterns and Time Outside the Village for Project and Control Sites

Activity	Project Site		Control Site	
	Number of Trips per Month	Average Travel Time (minutes)	Number of Trips per Month	Average Travel Time (minutes)
Buying Provisions	2	20	1	30
Selling Crops/Products	1	20	2	60
Going to School	2	30	1	50
Processing Agriculture Products	2	30	2	60
Visiting Family and Friends	1	90	1	180
Accessing Medical Care	1	30	1	90
Going for Employment or Business	1	60	1	240
Obtaining Official Documentation	1	30	0.3	110
Other	1	90	0.6	360

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

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

64. Evidence from the survey also shows that control community households are much more likely to travel on foot for all tasks. Project households are much more likely to use either a bicycle, motorcycle, or 3-wheeler. In general then, project households have the opportunity to travel more for all tasks, have greater access to and make greater use of transport services, use private modes of transport like bicycles and motorcycles more, and have greater choice in deciding whether or not to travel for tasks like crop processing and selling as they have a greater variety of services available in the community. Project communities also appear to have better access to safe sources of drinking water and to have better sanitary and toilet conditions (Table 6). This may be a function of the general 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 (NGOs) to communities; roadside communities are more likely to have services provided under these schemes. Overall, 19% of all respondents have functioning electricity. The proportion in project locations is far higher (28%) than in control areas (11%). This too is a direct consequence of the better location and accessibility of project areas being beside the road. The level of general education of project households is better than that of control households. Average years of schooling for the head of household and spouse were 6.4 years in project sites compared to 5.2 in control sites. Roads are 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.

Table 6: Access to Water, Sanitation, and Electricity

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

Source: Household survey data.

2. Community Commercialization and the Flow of Goods and Services

65. Chapter III shows that there are gradations of the poor from the completely landless, to farmers on small plots producing for subsistence and others producing sufficient surplus to sell at certain times of the year. The majority of those classified as very poor or poor are engaged both in smallholder farming and wage labor. They too are, therefore, heavily reliant on the commercialization of agriculture that the 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 diversifications (*pili* in Sorsogon) and intensification (rubber in Bengkulu). A majority of all the respondents (61%) who farm land say that they produce the same type of crops as 5 years ago. However, there is some difference between project sites (55% no change) and control sites (67% no change).

66. Figures for the sale of agricultural produce are 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 sell more quantity now than 5 years ago, 67% answered that they do not. Among those who do sell more, about 8% attribute 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 are selling more and who attribute this to better outside marketing opportunities is higher, at 12%. Comparing socioeconomic groups, 71% of the very poor and 70% of the poor say they do not sell more quantity now than before road rehabilitation; only 48% of the better off make the same response. This suggests again that the opportunities for commercialization are much greater for the better off than for the poor and very poor.

67. Improved roads clearly improve general opportunities and the environment for buying and selling, particularly to visiting buyers. In the project sites, 54% of households say that more buyers visit the community now than 5 years ago compared to 36% in the control households. With respect to transporting produce for sale, the poor and very poor are still much more likely to lack access to transport services than the better off. Among all respondents, 71% of the very poor say that their primary transport means for crop sale is on foot, against 63% of the poor and

46% of the better off. The importance of better roads to crop commercialization generally can be seen from Table 7. For control communities, the primary condition necessary for the better marketing of crops is seen to be better roads as well as better transport services. Project households feel that better prices and more buyers in the community are important, but otherwise would appear to feel that the conditions for selling their crops are broadly present.

Table 7: Conditions Necessary for Better Selling of Agricultural Produce (%)

Condition	Project Site	Control Site	Total
Not Selling	39	27	33
More Buyers in the Community	15	11	13
Better Prices for Goods	15	9	13
Better Roads to Travel to Market	10	28	19
Better Transport Services to Market Centers	5	8	6
More Frequent and Reliable Transport	2	3	2
Cheaper Transport	2	0	1
Other	12	14	13
	100	100	100

Source: Household survey data.

68. Where there is no state or project support for creating the infrastructure and enabling environment for diversification of production to take place, 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 again the importance of the prevailing context and traditions in determining peoples' response to the potential opportunities that better roads may bring. In the Sorsogon survey, respondents said that there were no discernible differences in the pattern of sale and commercialization of the crop compared to before road rehabilitation and no cash crop alternatives have developed. This is probably a result of the structure of land ownership in the area, with most farmers operating as smallholder tenants, 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 has developed in the Indonesia and Philippines case study areas. The Yogyakarta and Matara study areas have witnessed an increase in seasonal transit markets along the road for the sale of crops. These transit markets act as collection points for visiting intermediaries to buy produce at peak agricultural times and suggest increased agricultural intermediary activity in the study area following road rehabilitation. However, many poorer farmers in the area are chronically indebted to these same intermediaries, and so have little scope for maneuver in deciding whom they sell to and at what price. Better access does not necessarily lead to better prices for poor farmers.

69. **Small Business Development.** Road investments have had significant indirect impacts on the general level of economic development in each of the study locations. This is clear from

Box 7: Small Business Development

- Mr. Piyadasa's family in Kurunegala has given up farming (despite owning land) to start a confectionary business which has benefited substantially from the road improvement (Appendix 8, Box 7).
- Mrs. Sukarta in Yogyakarta does a small part-time business dressing brides because she now saves travel time in her regular teaching job (Appendix 8, Box 9).
- Mr. Nimal in Matara has moved his tea plant nursery near the road and has managed to establish a thriving small business (Appendix 8, Box 13).

the development of small businesses in the project communities. 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 buy village produce or make their own and sell it in the nearby market centers. They also save people time in their previous occupations, allowing those who have the skills and/or savings to

invest in other small businesses. Among project case 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 rehabilitation of the road, 55% felt that the project had a positive effect on these enterprises. Of the 17% of project respondents who had started a business since road rehabilitation, 69% said that the road was a factor in their deciding to start the business. Of these businesses, the majority in all locations were small provision stores supplying the local community. There is little difference between those in project and control locations who are planning a small business (about 51% for each); but among social groups, the better off are much more likely to have such a plan (63%), against 52% of the poor, and 43% of the very poor.

3. Migration and Remittances

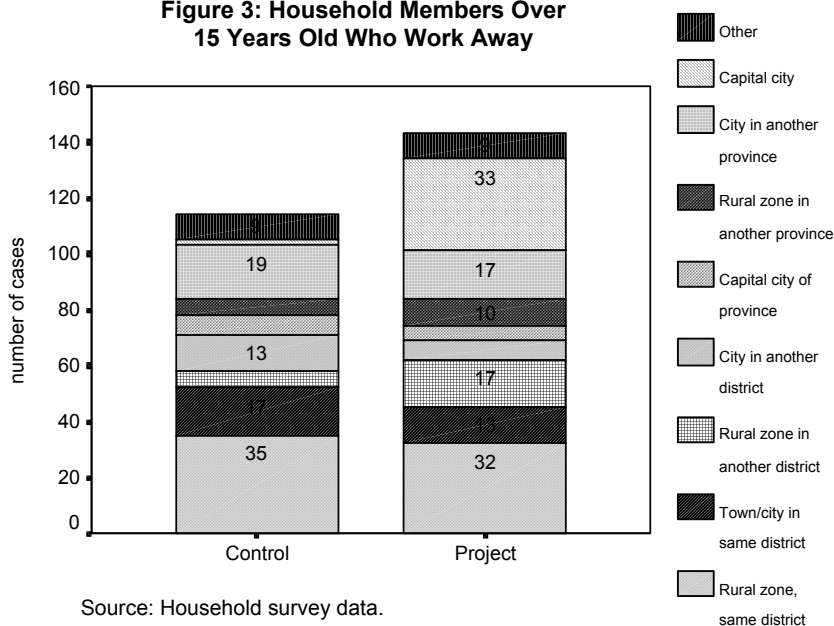
70. Better roads offer an expanded scope of opportunity outside the village. But there appears to be no significant link in the study areas between migration for employment and poverty status—if employment is short term or seasonal and badly paid, then it is unlikely to be secure and regular enough to 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 on 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 7). Lack of education and lack of support networks in more urban areas compound this trend.

71. 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 be the Sri Lanka case studies. Here, there appears 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 stems largely from the search for seasonal wage-labor opportunities that are close to existing locations and usually for a short period (up to 3 months) only. Among all survey households that provided valid responses, 68% do not work away from the community at any time of the year. Analysis of the results from the remaining 32% shows that there are clearly two kinds of migration taking place: (i) seasonal, relatively short-term migration to other rural areas, usually in the same district, in search of agricultural wage-labor opportunities; and (ii) relatively longer-term migration to urban areas, in search of nonagricultural employment.

72. In looking at the activities in which the migrant laborers are engaged when working away, it is clear that project households have access to better opportunities for employment outside agriculture. More are employed either in regular jobs or in other activities such as urban, relatively longer-term, employment. Among all survey responses, temporary and seasonal work accounts for 62% of all outside employment and activities. In terms of the time spent away from home, 25% of all outside activity is weekly, i.e., for regular employment that may require staying in town during the week and returning to the village at the weekend. A further 20% is 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, is 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.

73. The differences between the project areas and the control communities are shown in Figure 3. The comparison shows that more members of the project site work away than in the control sites. They are more likely to work in a rural zone in another district, in the provincial capital, and in the national capital city. In gender terms, more men than women are likely to work away, but of the women who do work away, a larger proportion are employed in the capital city or other cities, and less in rural zones, implying that they are more likely to move for skilled or semiskilled nonagricultural labor than for seasonal agricultural work in the immediate locality.

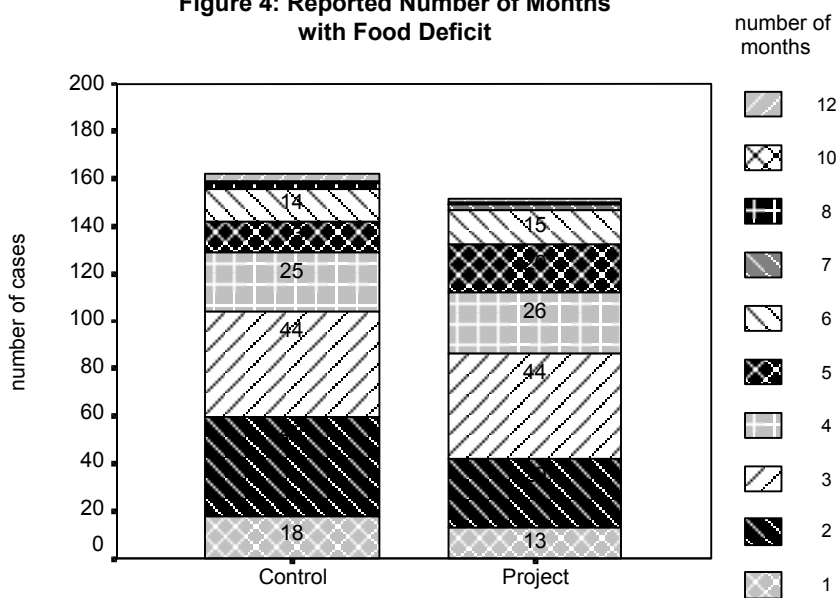
Figure 3: Household Members Over 15 Years Old Who Work Away



D. Changes in Income and Welfare

74. 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 the vulnerability to external shocks.³⁷ Improvements in rural roads are expected to generate new opportunities to earn income and

Figure 4: Reported Number of Months with Food Deficit



Source: Household survey data.

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.

1. Food Security

75. Food security is a critical indicator of poverty common to all of the study locations. A large part of each community is affected by lack of food at critical points of the year.³⁸ Overall, 74% of all survey respondents reported

³⁷ The study assumes that the poor and very poor being risk averse will not diversify to other sources of income unless it reduces their poverty status.

³⁸ 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 through the normal productive activities of household members.

facing some food shortages during the year. This broadly corresponds to the poverty classifications shown earlier. It is only those who are considered better off or rich who are completely free from any food difficulties. Of those who reported food difficulties, marginally fewer live in the project sites than in the control sites (Figure 4). There is also little difference in the reported number of months of food insecurity between the sites, suggesting that food insecurity affects 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 be 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 be a result of several other factors that influence poverty.

2. Household Income

76. **Better-Off Groups.**³⁹ All groups in the study villages have benefited potentially from the improved opportunity that better roads bring. There has been a better availability and mix of transport services, and an 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

Box 8: The Better Off Get Better

- Mr. Labarga from the Negros project site belongs to the better-off group. He has invested savings from his fish vending business to improve his business as a result of the better road (Appendix 8, Box 11).

income is, therefore, important to reduce poverty. In practice, of course, it is those who are most secure and with 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 increase in relation to the degree to which households are nonpoor. The better off have surplus funds to invest in trading (even at very modest levels), have an agricultural surplus to sell, or have the network of connections and relationships outside the community enabling them to take advantage of trading or working opportunities. They have 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 rely on a regular and rapid link and so benefit substantially from the efficiency and cost savings in commuting. They are heavily represented among the households considered better off in the study sites.

77. Improvements in income were a key area of inquiry for the household survey. Table 8 below 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, 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, more from other sources, against 14% of control site respondents. Of the different socioeconomic groups across all study communities, the better off have both diversified and increased their income more than the poor and very poor. About 22% of better-off households report increasing both agriculture and other sources of income, whereas more than 50% of both poor and very poor groups report no change at all in sources of income.

³⁹ The better off in the study communities are not poor in a national sense (Appendix 3, para. 4).

Table 8: Change in the Source of Income Over the Past 5 Years (%)

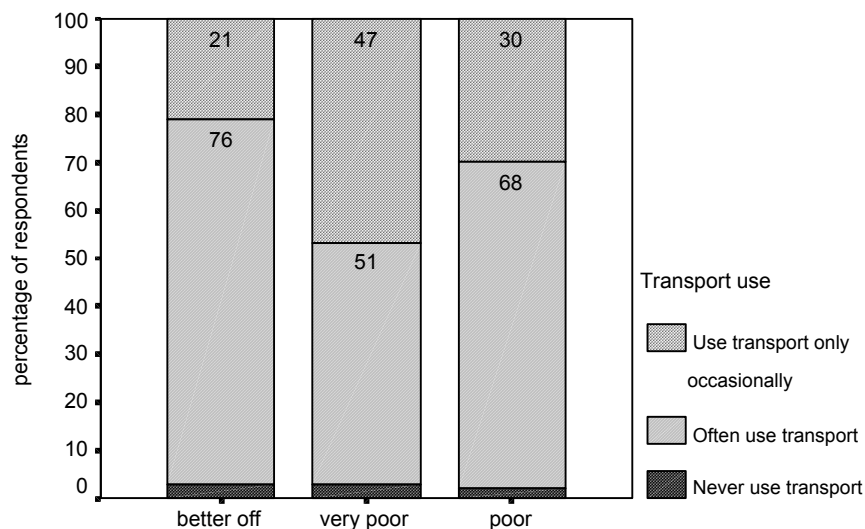
Change	Type of Site			Socioeconomic Group			
	Project	Control	Total	Better Off	Very Poor	Poor	Total
No Change	47	58	53	36	54	55	52
Less Income from Agriculture, More from Other Sources	23	14	19	24	15	20	19
More Income from Agriculture, Less from Other Sources	8	7	7	9	7	8	8
More Income from Both Agriculture and Other Sources	8	5	7	22	3	5	7
More Money Sent from Outside	2	2	2	2	2	2	2
Other	12	14	13	8	19	10	12
	100	100	100	100	100	100	100

Source: Household survey data.

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

79. **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 are for subsistence and household tasks, rather than for activities that are directly productive in

Figure 5: Frequency of Use of Transport Services
(project sites)



Source: Household survey data.

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 differs (Figure 5). Among the very poor, 47% say that they use transport only occasionally

because they have little need for traveling outside the community more regularly, compared to only 21% of the better off and 30% of the poor.

80. There is little evidence from the case studies of an increase in personal mobility among the very poor following road rehabilitation in search of job opportunities outside the community or for any other reason. But where the economic conditions are right, better basic road access can impact on 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 6). In the study areas, a few households graduated from the poor to nonpoor status because of the opportunities that the road provided.

Box 9: The Poor Able to Graduate if Conditions Permit

- Mr. Bon and his family belonged to the poor group in Sorsogon. Using his carpentry skills, he was sometimes able to save money, which his enterprising wife used for occasional banana supply business. The improved road greatly helped their business and increased their income (Appendix 8, Box 6).
- Mr. Valenzuela and his family belonged to the poor group in Negros project site. He used his carpentry skills and a network of contractors (made possible by the improved road) to find other opportunities outside. He is also using the travel time savings for productive purposes (Appendix 8, Box 8).
- Mrs. Peti in Bengkulu who used to be poor started a small business as a vendor at the market before the road rehabilitation and used her savings to expand the business to a kiosk. She has now been able to buy a truck to further her opportunities (Appendix 8, Box 17).

3. Welfare Indicators

81. 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.⁴⁰

82. **Safety Net for a Crisis.** In circumstances where conditions for agriculture are difficult, the road has proved to be an important safety net of sorts in generating alternative livelihood opportunities.

Box 10: Complementary Activities Connected to the Road—Helping the Poor Cope with Crisis

- The Weeragama Milk Cooperative's collection center allows even the poor to sell milk regularly as an alternative livelihood. This operation relies heavily on all-weather road access (Appendix 8, Box 10).
- All-weather access has also allowed small fish traders on bicycles and motorcycles to operate in the surrounding villages (Appendix 6).
- The villagers collect cow dung as a collection truck began operating after road rehabilitation (Appendix 6).

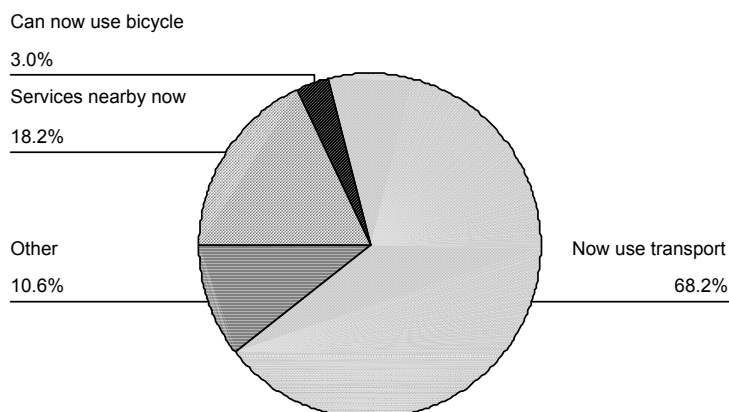
The severe drought over the past 3 years in Kurunegala has heavily impacted on the landless who are employed on the fields of the landowners in a variety of tasks throughout the year. All have been forced to try and find alternative ways of generating income and securing their basic needs, and the road has been crucial in the development of these alternative livelihood strategies such as raising livestock. This alternative

income stream, though temporary or seasonal, is 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 has proved to be an important enabling factor in offering villagers such security in difficult times (Appendix 6).

⁴⁰ Improvement of social activities to attend social and religious events and strengthen family social networks is an important advantage of rural roads, though not elaborated below.

83. **Social Safety Net.** One of the major benefits to the poor of improved rural roads is their ability to better access state, in particular health, services. 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 to the poor. Isolation and remoteness contribute to the perception of poverty among rural people. This

Figure 6: How Transport to Health Services Has Changed in the Last 5 Years



Source: Household survey data from project sites.

perception is reduced with the assurance that it is possible in an emergency to easily access 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 are twice as likely to use a traditional healer. Project households clearly make better use of medical facilities through the road. Of control households, 14% stay at home in response to poor health or a health emergency against 7% of project households. For basic needs, 53% of control households access a hospital or dispensary against 76% of project households. All socioeconomic groups appear to access health services broadly in equal measure. In traveling for treatment, over 50% of control households walk in comparison to 32% of project households, and the latter are much more likely to use either a bicycle, 3-wheeler, or van than control households. Among the very poor, 50% overall still walk 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 has changed over the past 5 years in the project sites since the improvement of the road are shown in Figure 6. Previously, they would either walk or have no easy access to such services.

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

Box 11: Teacher/Nurse/Extension Officer

- Mr. Sidik, a teacher in Yogyakarta, saves time traveling for his regular job and uses spare time to work on his farm (Appendix 8, Box 20).
- Mrs. Suryatini, a nurse in Yogyakarta, can do her job much more effectively, visit her clients year round, and improve preventive care (Appendix 8, Box 21).
- Mr. Sumianto, an extension worker in Yogyakarta, has been able to improve his achievement rate to 90% of target compared to 40% before road rehabilitation (Appendix 8, Box 22).

85. **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 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.

86. **Broadening Opportunities.** A major benefit shared across socioeconomic groups is the greater availability of time, resulting from better access and improved transportation. Obviously, those in the community who travel most frequently benefit most from this. But for the very poor too, improved access even locally can mean significant time savings, and thus time to engage in other productive activities (Appendix 8, Box 5). 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 on 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 include 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, like bicycle repair stalls. The road, together with other enabling conditions, offers better opportunities for broadening and diversifying livelihoods.

87. **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 risks of exposure to the sex trade in nearby urban centers and trafficking, particularly for young, poor rural women. Provincial health officials in the Philippines identified the risks of sexual exploitation and drugs as key negative risks 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.

88. **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 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 is little evidence of such a shift in access to land or of a steep increase in land prices. Neither is a high turnover in land ownership following road rehabilitation apparent. The structure of land ownership and the market for land have 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%).

VI. CONCLUSIONS AND RECOMMENDATIONS

A. Study Conclusions

89. Improved roads guarantee rural 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 can make use of a wider variety of transport services, which are more frequent, take less time to travel 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.⁴¹

90. The poor and very poor assign a 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 village, walking world, and improvements to this primary village network of tracks, etc., that reduce the burden in undertaking 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.

91. 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 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 the road depends on their asset base and the entitlements to resources and opportunities that they can command, as well as 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 primarily benefit 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.

92. 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

⁴¹ Those along the roads are also subject to road safety issues, though this was not prominent on case study roads.

agricultural production. 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.

93. The second group covers the 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 is a fundamental determinant, but is a political issue that ADB can hope to influence only in broad terms over a period of time and at a macro level, 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, which broaden opportunities for the poor and, at the same time, challenge some of the ingrained structural perceptions that restrict opportunities otherwise. 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.

94. 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, which could broaden livelihood opportunities for the poor. In practice, however, this was not always the case.⁴² 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 those in the Philippines in improving livelihoods for the poor, as the roads covered in these 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 landholding 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.⁴³ 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.

95. It is recognized that 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 livelihood capital with which to make use of improved rural roads. For this, linkages with complementary activities and services, which support the broadening of livelihood

⁴² Some anticipated impacts were diminished by shocks such as droughts and adverse world market prices.

⁴³ These criteria were introduced by the executing agencies to ensure the viability of newly-established plantations and to ensure high aggregate rubber yields.

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.

B. Recommendations for Strengthening Poverty Reduction Impacts

1. Measures Directly Related to Transport

96. **Broadening Access.** All of the case study locations demonstrated, to a greater or lesser degree, a high level of road density.⁴⁴ 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. It could mean designing interventions that concentrate on removing the access and mobility constraints of the poor in their existing livelihoods, and thus 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.

97. **Periodic Maintenance.** Long-term social and economic benefits from roads are often threatened by a neglect of periodic maintenance. Rural roads, particularly gravel roads, quickly deteriorate if not regularly maintained, and benefits can be quickly lost if they 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 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.

98. **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 (para. 50), 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 (para. 101), the poor may be able to diversify income through selling craftwork, 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.

99. **Criteria for Road Location and Type.** Often, the decisions about what roads are selected are not transparent. Participation is a key element in the selection of roads to be rehabilitated or reconstructed under rural road programs, not only to decide which roads need improvement but also to understand the type of road and ancillary investments that are needed.⁴⁵ 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.

⁴⁴ This was confirmed by the difficulties in identifying suitable control areas (Appendix 1, para. 27).

⁴⁵ However, the study acknowledges that detailed design of a particular road needs to be carried out by engineers with appropriate competencies in the most cost-effective manner.

100. **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.⁴⁶

2. Measures Not Directly Related to Transport

101. **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 projects that were sector road investments, and integrated investments where the road was one part of a larger program of support. In practice, these integrated projects were either not truly integrated, or were focused largely on benefiting better-off farmers' groups. The poor require genuinely integrated programs of support right through the cycles of production, transportation, and sale.⁴⁷ Diversification into alternative livelihood opportunities will also cushion them against the impact of adverse movements in commodity prices.

102. **Promoting Understanding.** Another key role that governments have to play is in 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 ADB, and shared objectives should be agreed toward the common end of poverty reduction and addressing related structural barriers.

103. **Participatory Design and Planning.** The preparation in the context of 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.

104. **Poverty Assessment.** If poverty reduction is an objective, a proper analysis at project design stage is necessary of who are the poor and on what factors do 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 if effective, structured baseline research is done at inception.

⁴⁶ An example of the effective and sustainable use of labor-based methods for poverty reduction is the Nepal Rural Access Program design, where poverty groups are targeted for employment (including poor female household heads, and women employed traditionally as long-distance porters whose livelihood will suffer from road construction) during agricultural off-peak times without compromising other livelihood activities. Workers should contribute to parallel credit and savings schemes that allow them to move to livelihood alternatives once road construction is finished.

⁴⁷ 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 be able to undertake credit and marketing and also be able to access affordable transportation.

105. **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.⁴⁸ Benefit monitoring and evaluation systems⁴⁹ 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 cost 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 complemented by impact indicators for identifying exactly what the outcome of works had been, particularly on the poor.

106. **Partners.** How best to implement rural roads with integrated livelihood support components is a difficult question. ADB 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 NGOs who have a proven track record in mobilizing and working closely with communities. It should be recognized that complex, integrated programs may require a number of partners, and ADB can play a key role in helping executing agencies manage and coordinate this process effectively.

⁴⁸ Often, impacts on the villagers and particularly the poor and very poor take long time to materialize and need to be monitored periodically to evaluate progress.

⁴⁹ Benefit monitoring and evaluation has now been superseded by ADB's project performance monitoring system.

METHODOLOGY DETAILS

A. Study Direction Determined at Methodology Workshop

1. 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 (Main Report, paras. 6–9). This appendix gives further details that steered the study methodology including the criteria for selecting the projects, study areas, and effectiveness of various study tools used. Following the literature review and the review of documents, the study team developed a preliminary methodology approach, which included a list of suggested instruments, definitions to be used, and possible key indicators. During the methodology workshop, the participants clarified the direction the study should take. The following indicate the key points determined:

- (i) 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.
- (ii) 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.
- (iii) The study tried to maximize the learning experience by understanding the factors that drive the impacts rather than measuring the magnitude of the impacts, relying rigidly on the double difference technique.¹
- (iv) The study consciously focused on poor areas to ensure that impacts on the poor's livelihoods could be better captured.
- (v) Based on the limited information available in a retrospective study, a variety of tools were used sequentially with each intending to inform the next and all geared to support and validate the findings.

B. Methodological Assumptions

2. **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 the road and that shape livelihood constraints and opportunities. This meant that primarily relying on classical road assessment tools such as traffic movements, vehicle operating costs (VOCs), and freight and passenger prices to assess impacts was not sufficient. They were also not readily applicable to rural roads² 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. This may include the ability to make periodic social visits, a broadening of choice about where and whether to sell surplus agricultural produce, migration for seasonal work, access to health services, and a greater readiness of professionals to work in remote areas (as doctors, teachers, etc.). Negative impacts could include a 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.

¹ The 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.

² Rural roads were defined as roads through rural areas. Different countries have varying classifications for roads depending on technical specifications, sources of funding, and the importance of the points they connect.

3. **Multidimensional Poverty.** The study assumed that poverty is a multidimensional condition, and that lack of income was 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 builds 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 (i) lack of income and consumption; (ii) lack of private and social assets (human, social, natural, physical, financial); (iii) voicelessness, lack of dignity, and inability to participate; (iv) insecurity and vulnerability to risk and to shocks; and (v) lack of ability to influence institutions and processes at the macro and micro levels.⁵

4. **Direct and Indirect Impacts.** The study considered the 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 the direct impacts. They too can be positive (reduction in agricultural input prices) or negative (spread of diseases).

5. **Road Infrastructure and Transport Services.** The study assumed that rural roads are a necessary but not sufficient condition for provision of rural transport services. Rather, 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.

6. **Access and Mobility.** The study adopts a broad focus on “access.” Both physical and nonphysical barriers to access are assumed. Improving transport for the poor requires both the provision of infrastructure and services and the consideration of the key socioeconomic parameters, which 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 (Main Report, para. 80).

7. **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 commercial sex trade.

³ ADB. 1999. *Fighting Poverty in Asia and the Pacific: The Poverty Reduction Strategy*. Manila, p. 5.

⁴ Hanmer, Lucia, Elizabeth Lovell, Robert Chapman, and Tom Slaymaker. 2000. *Poverty and Transport: A Toolkit*. Overseas Development Institute.

⁵ Drawn from various sources including Carney, Diana, ed. 1998. *Sustainable Rural Livelihoods. What Contribution Can We Make?* Department for International Development (DFID). United Kingdom; and Ashley, Caroline, and Diana Carney. 1999. *Sustainable Livelihoods: Lessons from Early Experience*. DFID.

⁶ Coedited by Priyanthi Fernando and Gina Porter. 2002. *Balancing the Load. Women, Gender and Transport*. International Forum for Rural Transport and Development. Zed Books.

C. Study Tools Used

8. All research activities were intended to be mutually reinforcing components to 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 to inform the use of the next.

9. **Key Impact Indicators and Baseline Data.** Local consultants recruited in each country worked according to an agreed methodology. An important early task in each country was the collection of key data indicators for socioeconomic development and agricultural production in the study areas across the lifetime of the project (usually the past 10 years). They 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.

10. 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.

11. 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 level authorities. Consequently, this component of the methodology was only partly completed.

12. **Key Informant Interviews.** Semistructured interviews with key informants at national, provincial, and local levels provided background information 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 semistructure the interview. Often, these interviews enabled the study team to disaggregate groups in the study area, particularly in identifying subgroups of the poor. They also helped develop an outline for stakeholder analysis, which could be further adapted by subsequent participatory research activities.

13. 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 the site selection and provided historical information on the selected sites, i.e., in terms of the conditions prior to road improvement. The

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 the village activities prior to the construction of the road.

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 site and identifying poor groups within them. Types of persons interviewed were:⁹

- (i) project management offices at national level;
- (ii) project management offices at provincial level;
- (iii) other provincial level key informants in agriculture, transport, health, social services, and infrastructure;
- (iv) project management units at district level relevant to case study areas;
- (v) extension services staff;
- (vi) village level key informants
 - (a) village leaders
 - (b) community-based organization and self-help group representatives
 - (c) schoolteachers
 - (d) shopkeepers
 - (e) transport operators
 - (f) traders within and outside the village
- (vii) those who had graduated from poverty since project intervention (interviewed all possible households available); and
- (viii) those who remained poor despite project intervention (interviewed a sample of households).

14. **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 process. 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 were used in the different locations based on the suitability for the particular location, group of individuals, and priority issues under discussion. The methods used included:

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

15. 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

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

analysis.¹⁰ The familiarity gained through these exercises also helped the enumerators to subsequently penetrate the village for 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 for a length of time facilitated this understanding among the villagers to a great extent.

16. **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” and “market” day in study locations. 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 of the volume and mix of traffic in each location. The study team carried out the following surveys:

- (i) 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;
- (ii) passenger and freight survey (on moving vehicles) to gauge purpose of travel, time expended, value of goods transported, and transport prices; and
- (iii) interviews with vehicle operators to understand impacts on VOCs, frequencies, and travel time.

Table A1.1: Average Daily Traffic by Project Site^a

Mode	Sorsogon ^b	Negros	Kurunegala	Matara	Bengkulu	Yogyakarta
Bicycle		53	254	123	10	13
Cart					7	
Motorcycle	28	257	155	153	252	1,301
Tricycle	55	276				
3-Wheeler			1	45	1	
Tractor			8	16		
Truck	4	162	20	45	8	154
Car/Van	7	99	10	43	62	202
Jeepney	22	53				
Minibus		40	5	16	34	217
Van/Truck				28		
Bus		32	4			24
Total	116	972	457	469	374	1,911

^a These counts reflect the average of a market and nonmarket day in the project site between 6 am and 6 pm of the traffic in both directions.

^b Due to security concerns, the traffic surveys were carried out only from 8 am to 4 pm in Sorsogon, and the 2-week fieldwork period did not include a market day. Since this was the first field site, only motorized traffic was counted and bicycles were not counted. However, there was some bicycle usage in the area, especially among poor children going to high school as this did not involve a daily transport cost.

Source: Household survey data.

¹⁰ See a sample framework in Appendix 2.

17. **Household Surveys.** The household survey was used in common (as far as this was possible) across all three countries to enable cross-country comparison and identification of key trends and impacts. It was also collected in both project and control communities. In terms of time and effort, this occupied a major part of the fieldwork. Data were collected from about 80 households in each study area (40 in the project site and 40 in the control site).¹¹ The questionnaires were pilot tested in Sorsogon, Philippines and subsequently slightly changed to adapt to differences in the context of each study area. The enumerators all spoke the local dialect and generally interviewed the respondents in their homes, enabling sufficient time to capture information on structured questions, as well as on open-ended ones. The total number of households surveyed and the gender distribution of the household head is 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.

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

Location	Sex of Household Head		Total
	Male	Female	
PHI-Sorsogon Project Site	29	2	31
PHI-Sorsogon Control Site	38	2	40
PHI-Negros Project Site	38	1	39
PHI-Negros Control Site	38	1	39
SRI-Kurunegala Project Site	35	5	40
SRI-Kurunegala Control Site	28	1	29
SRI-Matara Project Site	35	4	39
SRI-Matara Control Site	35	6	41
INO-Bengkulu Project Site	38	2	40
INO-Bengkulu Control Site	38	2	40
INO-Yogyakarta Project Site	34	6	40
INO-Yogyakarta Control Site	38	1	39
Total	424	33	457
Percentage	93	7	100

INO = Indonesia, PHI = Philippines, SRI = Sri Lanka.
Source: Household survey data.

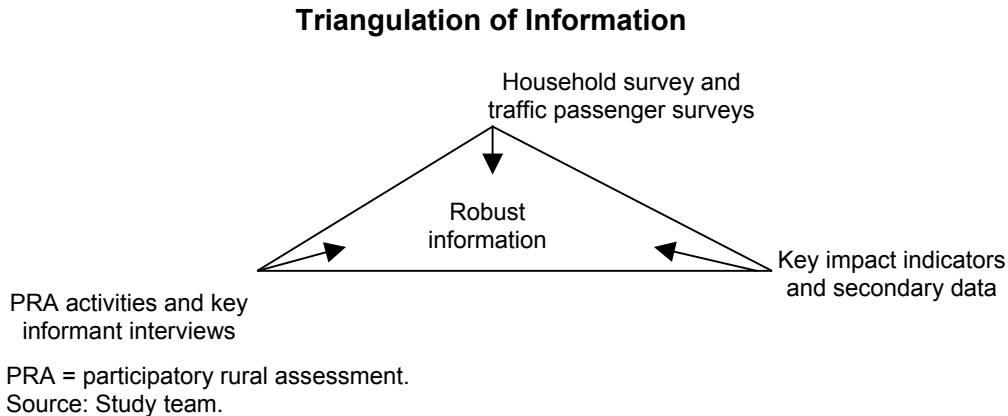
18. **Workshops.** Country feedback and discussions were held in one location in each country following the completion of the draft country report. The preliminary findings were discussed with implementing authorities, local officials, and community representatives, allowing the team to validate findings.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

19. **Framework and Triangulation of Information.** As discussed above, a variety of different methodological tools were 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

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 2.

community assets, the framework also analyzes the institutions and processes that determine 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 the figure below.



20. **Attribution of Impacts.** Given the absence of useful baseline information, it was difficult to use 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 these 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 (Main Report, para. 8). 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.

D. Project Selection Criteria

21. It is important that in the case studies selected, sufficient time has 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 opening of a rural community. If too much time has elapsed, it would be more difficult to discern the impact of other major interventions from those of the rural road. Therefore, a careful balance is needed in terms of the time frame for selecting case study projects. As such, case study projects selected had to have been physically completed a year or more before the fieldwork. Therefore, projects approved mostly in the 1990s, which satisfy 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 to be identified. The three selected were Philippines, Sri Lanka, and Indonesia. This was influenced by the decision not to duplicate other

ongoing efforts but to complement them.¹³ In each country, a rural road component under a transport sector project and an integrated rural development project (under agriculture sector projects) with a rural road component were selected with the intention of comparing the impacts of road investments on their own, or as part of a wider program.

E. Study Area Selection Criteria

22. Given the limited time available for the study and the extensive geographic scope of ADB operations in Asia, it was clearly important the selected fieldwork sites were 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, or as part of a wider program, could also be compared.

23. 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 a uniformly representative site selection difficult. Besides, each country, region, and specific area has characteristics particular only to that location, and the case studies were to capture these contextual scenarios which flavor the findings.

24. Prior to the start of fieldwork, the local consultants visited possible project locations to establish preliminary contacts and collect baseline data as well as key impact indicators. They also visited a few road segments selected for inspection based on the road selection criteria. The road area selected had to be (i) representative of the prevailing poverty conditions faced by rural people in the project area; (ii) broadly representative of the access conditions and restraints faced by rural people; (iii) a reasonably long project road segment (about 10 kilometers) to have an impact on the level of economic activity; and (iv) have another community in the vicinity that could act as a control area.

25. 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 and experience of the area, its poorer areas, and were best placed to identify a road section suitable for the study purpose. 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 assumed to be high. A focus community (project site) was selected from along the road link where research activities were concentrated. The same

¹³ The People's Republic of China, India, and Thailand were selected under the ongoing TA 5947-REG: *Assessing the Impact of Transport and Energy Infrastructure on Poverty Reduction*, for \$800,000, approved on 25 October 2000, 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 (2002). Fieldwork in Pakistan was not possible at the time due to security concerns, and work in the Pacific islands was deemed too expensive. The projects in the Mekong region were ongoing and too recent for discerning the impacts. Nepal, due to its difficult geographic terrain, was considered to be not very representative of the rest of the Asian landscape.

criteria for selection of both roads and study communities were used in all countries to ensure cross-country comparisons.

F. Practical Difficulties Encountered During the Study

26. **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 the impact 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 and monitored by provincial or district level authorities. Consequently, this component of the methodology was only partly completed.

27. **Control Sites.** Finding good control areas against which to compare project and nonproject cases proved difficult to different degrees. In practice, there were very few locations that could be described as lacking completely 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 a sufficient population, so the study team adopted a full census of the control area or used more than one control site. A lot of 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.

28. **Locational Difficulties.** In most locations, the participation of local officials was excellent and this was a key factor in the successful implementation of the study. However, in some instances, there was variation in the interest of these officials driven by 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 in the sites. This prevented the enumerators from freely observing the household conditions of the respondents in one location. In other sites, there were various logistical problems (power failures, lack of accommodation, etc.). Despite this, the quality of the data collected was very good due to the dedication of the study team who spent long hours in trying conditions in the field during the day and many hours discussing, validating, and recording findings in the evenings.

SAMPLE FRAMEWORK FOR DOCUMENTING FIELD RESEARCH¹

Condition	Field Observation	Impact Indicator	+ or - Link to Transport
A. Structural Conditions			
Geography	<ul style="list-style-type: none"> ▪ Type of geographic conditions and terrain observed 	<ul style="list-style-type: none"> ▪ Physical difficulties associated with movement of people and goods ▪ Levels of air and noise pollution ▪ Degree of soil erosion and slope instability 	<ul style="list-style-type: none"> ▪ Sets the conditions for the type of transport which prevails or is possible ▪ Influences the cost of improving transport infrastructure ▪ Road construction and road itself may bring environmental degradation through air and noise pollution, slope instability, and soil erosion
Location	<ul style="list-style-type: none"> ▪ Proximity to marketing centers and centers of administration/information ▪ Proximity to coast and to natural resources (mineral deposits, forests, etc.) 	<ul style="list-style-type: none"> ▪ Connectivity of location to outside locations ▪ Household travel patterns 	<ul style="list-style-type: none"> ▪ Distance of households from marketing center, community facilities, capital, coast, roads, and other infrastructure
Seasonality	<ul style="list-style-type: none"> ▪ Degree to which vulnerability increases at different times during the year 	<ul style="list-style-type: none"> ▪ Food security through the year ▪ Household income through the year ▪ Impact of changing climatic conditions through the year 	<ul style="list-style-type: none"> ▪ Lack of all-season access to community and all-season roads ▪ Seasonal demand for transport services
Population Density	<ul style="list-style-type: none"> ▪ Reduced availability of land—high incidence of landlessness ▪ Subsistence agricultural production with no generation of surplus—high incidence of food insecurity 	<ul style="list-style-type: none"> ▪ Per capita land distribution ▪ Rate of population increase 	<ul style="list-style-type: none"> ▪ Level of effective demand for transport services and potential for demand growth in the future ▪ Population pressure as a restraint to agricultural accumulation through lack of land
Shocks	<ul style="list-style-type: none"> ▪ Population impoverished or infrastructure recently damaged by natural disasters 	<ul style="list-style-type: none"> ▪ Frequency of natural disasters ▪ Recent incidences of disasters 	<ul style="list-style-type: none"> ▪ Susceptibility to natural and human shocks and disasters (floods, famine, drought, and tsunami)
B. Capital Assets			
Natural	<ul style="list-style-type: none"> ▪ Size of landholding of cultivable land ▪ Security of land tenure ▪ Distance to nearest available water source ▪ Distance to energy source and nontimber forest products ▪ Quality of available land and natural resources 	<ul style="list-style-type: none"> ▪ Concentration of land ownership and incidence of landlessness ▪ Common property resources ▪ Availability of water and fuelwood 	<ul style="list-style-type: none"> ▪ Changes in land use through greater exploitation of local resources (minerals, forestry), and increased competition for land and resources (alienating the poor) ▪ Distance and time to household's productive assets may change
Social	<ul style="list-style-type: none"> ▪ Levels of access to the means and opportunity for different kinds of travel (household chores, productive, and social) between and within households ▪ Social and cultural restraints for women to travel ▪ Division of household labor and the availability of time 	<ul style="list-style-type: none"> ▪ Frequency of trips to marketing and social centers ▪ Frequency of travel within and outside the immediate area ▪ Number of trips made for different tasks ▪ Travel patterns for different household members ▪ Attendance at public 	<ul style="list-style-type: none"> ▪ Increased contact with other social groups, strengthening social capital through better opportunities for travel ▪ More opportunity for social travel at lower cost ▪ Access to information technology, new services, and opportunities ▪ Exposure to social ills, like drugs

¹ Hanmer, Lucia, Elizabeth Lovell, Robert Chapman, and Tom Slaymaker. 2000. *Poverty and Transport: A Toolkit*. Overseas Development Institute.

Condition	Field Observation	Impact Indicator	+ or - Link to Transport
	<ul style="list-style-type: none"> ▪ Community-based groups and organizations that are active ▪ Participation in decision making ▪ Scale of seasonal and permanent outmigration ▪ Frequency of travel to visit friends and relatives ▪ Impact of improved communications and opportunities upon local social structure 	<ul style="list-style-type: none"> meetings and levels of voting ▪ Levels of different kinds of migration 	<ul style="list-style-type: none"> and prostitution ▪ Improved access strengthening the hand of exclusionary groups (local mafias)
Physical	<ul style="list-style-type: none"> ▪ Location of markets and efficiency and accessibility of marketing system ▪ Road maintenance regime, whether or not local communities are involved ▪ Provision of other infrastructure services to the location (electricity, water, and communications) 	<ul style="list-style-type: none"> ▪ Levels of bicycle ownership ▪ Levels of motorized and nonmotorized vehicles on the road ▪ Frequency and affordability of transport services ▪ Road condition ▪ Degree to which road is regularly maintained ▪ Infrastructure provision (number of telephones, electricity connections, etc.) 	<ul style="list-style-type: none"> ▪ Improved ability to travel for water and energy needs ▪ Formal and informal employment generation in construction, maintenance, and related service delivery ▪ Better communications service delivery (post, telephone, etc.) ▪ Improved access to seeds, fertilizers, and agricultural inputs ▪ Quality of road versus level of investment and perceived benefit. Is it good value? ▪ Availability and affordability of transport services on the road
Financial	<ul style="list-style-type: none"> ▪ Availability of employment (seasonal or regular) ▪ Prices for agricultural inputs ▪ State of banking and formal credit facilities and credit/lending environment for the poor ▪ Household dependency upon remittances ▪ Affordability and availability of local transport services 	<ul style="list-style-type: none"> ▪ Existence of local industries and other labor opportunities ▪ Local craft production for sale ▪ Level of remittances sent/received ▪ Commercial environment for transport operators 	<ul style="list-style-type: none"> ▪ Opportunities for outside employment ▪ Reduced transport costs (operation and maintenance) for operators, and passed on (or not) to users ▪ Reduced travel times and increased levels of service ▪ Improved transport, increased labor productivity ▪ Decreased farm input costs and produce prices ▪ Improved income, improved access to markets, credit and savings facilities ▪ Location of credit facilities
Human	<ul style="list-style-type: none"> ▪ Availability of teachers and educational materials ▪ Availability of qualified health professional staff, medicines ▪ Frequency of health and education staff's attendance in the location ▪ Incidences of disease and state of health of population ▪ Level of education and skills training ▪ Availability of time 	<ul style="list-style-type: none"> ▪ Days teacher/doctor in residence ▪ School and health center attendance ▪ Visits by extension staff ▪ Effort expended on travel (gender disaggregated) ▪ Comparison of women's and men's labor tasks, and transport needs ▪ Number and frequency of road accidents 	<ul style="list-style-type: none"> ▪ Improved access to health care and to education and extension services ▪ Poor road and services limits ability to reach education/health services ▪ Lack of education/health infrastructure facilities and the means of transport to reach them ▪ Susceptibility to spread of HIV/AIDS ▪ Increased risk of road accidents ▪ Increased time available for the poor
C. Institutions and Processes			
National Government (including I	<ul style="list-style-type: none"> ▪ Competitiveness of local agricultural produce in the market place 	<ul style="list-style-type: none"> ▪ National laws, regulations, and guiding documents for rural transport sector 	<ul style="list-style-type: none"> ▪ Transport sector tariffs and regulatory framework for trade ▪ Environment for transport

Condition	Field Observation	Impact Indicator	+ or - Link to Transport
laws and regulations)	<ul style="list-style-type: none"> ▪ Supply of specialized agricultural produce from the location ▪ Impact of government support programs for the poor 	<ul style="list-style-type: none"> ▪ Import tariffs on bicycles ▪ Regulatory framework for transport operators ▪ National programs for microcredit and support to the poor ▪ Road safety laws 	<ul style="list-style-type: none"> operators ▪ Linkage of area to national markets ▪ Contractual arrangements for infrastructure tendering and maintenance regimes ▪ Spending priorities on pro-poor transport
Regional and Local Government (including laws and regulations)	<ul style="list-style-type: none"> ▪ Participation of local people in decision making ▪ Participation of local people in infrastructure and services planning, provision, and maintenance ▪ Availability of extension workers and effectiveness of dissemination activities ▪ Effectiveness of local government development activities ▪ Tax and regulation ▪ Existence of local government pro-poor programs 	<ul style="list-style-type: none"> ▪ Frequency of representative's visits to the area, knowledge of local people on who their representatives are ▪ Frequency of extension service delivery ▪ Participation in meetings, voting ▪ Effectiveness of interaction between local government agencies and NGOs/CBOs ▪ Local government pro-poor programs 	<ul style="list-style-type: none"> ▪ Effectiveness of local level infrastructure delivery and maintenance ▪ Provision of local "social" transport services (i.e., farm to market) ▪ Linkage of local people into the market ▪ Linkage of communities into decision-making bodies and processes ▪ Provision of government bodies support in agricultural and other services
Private Sector	<ul style="list-style-type: none"> ▪ Affordability and regularity of transport services ▪ Local participation in enterprises supplying transport-related services and infrastructure maintenance 	<ul style="list-style-type: none"> ▪ Number of enterprises supplying transport-related services ▪ Sales of transport goods and inputs—bicycles, tires, etc. ▪ Provision of affordable and regular transport services (taxi, bus) 	<ul style="list-style-type: none"> ▪ Provision of transport services ▪ Local contractors in partnership with government, responsible for infrastructure delivery and maintenance
NGOs and CBOs	<ul style="list-style-type: none"> ▪ Ability of NGOs to visit and operate in the area ▪ Mobilization of CBOs and their connectivity to other groups in the area 	<ul style="list-style-type: none"> ▪ NGOs and CBOs active in the community and their activities 	<ul style="list-style-type: none"> ▪ Interventions to improve transport at local level through appropriate technologies ▪ Mobilization of community groups for lobbying and community-based initiatives for locally-defined needs
Traditional Authorities	<ul style="list-style-type: none"> ▪ Influence of traditional leaders and village structures on behavior and access to resources 	<ul style="list-style-type: none"> ▪ Decision-making processes within the community and the dissemination of information ▪ Relationship of local leaders with the state and with surrounding communities 	<ul style="list-style-type: none"> ▪ Determine the distribution of opportunities and benefits, set norms for cultural practice ▪ Relationship of locality to the state
Cultural Norms and Practices	<ul style="list-style-type: none"> ▪ Perception of the community and different groups within the community of the outside world 	<ul style="list-style-type: none"> ▪ Shared practices and beliefs in the community particular to the homogenous group or area 	<ul style="list-style-type: none"> ▪ Excluding certain ethnic or religious groups from transport businesses ▪ Determine whether women can travel for trade
Gender Relations	<ul style="list-style-type: none"> ▪ Women's engagement in income generating and social activities within, and outside, the household ▪ Women's willingness and motivation to diversify their livelihoods 	<ul style="list-style-type: none"> ▪ Women's access to household resources (money and modes of travel) ▪ Women's household responsibilities and time to engage in trading and social activities 	<ul style="list-style-type: none"> ▪ Women excluded from taking public transport, using bicycles, or trading outside the community ▪ Women lack time to diversify their livelihoods—are time and energy deficient as have a heavy burden of household work

CBO = community-based organization, NGO = nongovernment organization.

POVERTY DETAILS

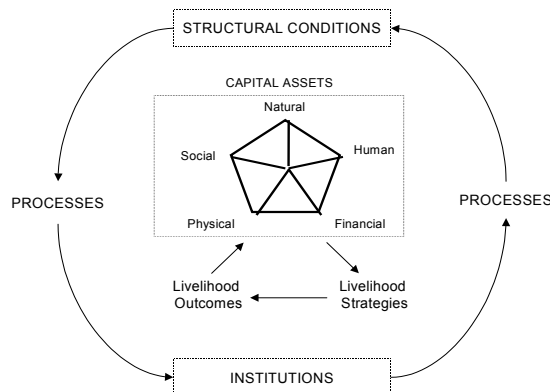
1. Chapter III describes the essential characteristics to understand the poverty situation in the case study areas and the factors that influence the extent to which rural roads can contribute to poverty reduction. This appendix shows how the study dealt with the issue of poverty in capturing its multidimensional aspects, as well as its relativeness across communities and countries. The community definitions of poverty in each location, as well as key poverty themes common to all locations, are also presented in this appendix.

2. 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 a 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 households into downward poverty spirals 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.”¹ Just as poverty is complex and multidimensional, the study has been 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 has sought to understand what role roads play in a successful strategy for escaping from complex poverty situations.

A. Who Are the Poor?

3. **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 seasonal crises. It also describes a state of voicelessness and an inability to influence the structures, institutions, and processes, which shape rural livelihoods. Fieldwork revolved around the analysis of livelihoods through using a capital assets-based approach.² It was assumed that people had five principal types of capital assets, and the relative strength and weakness of these assets determines vulnerability, susceptibility to shocks, and ability to participate in wider institutions and processes. The relationship of the assets (physical, financial, natural, human, and social) to the institutions, structures, and processes at work is represented in Figure A3.1.

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



Source: Carney, Diana, ed. 1998. *Sustainable Rural Livelihoods: What Contribution Can We Make?* Department for International Development, United Kingdom.

4. **Poverty in the Country Context.** As mentioned, the study does not rely on income poverty line definitions but uses poverty as a multidimensional concept. Therefore, the concept is not directly comparable with the income and headcount definition of poverty. This multidimensional definition for the poverty study 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 and showed

¹ Narayan, D. quoted in Lucia Hanmer, Elizabeth Lovell, Robert Chapman, and Tom Slaymaker. 2000. *Poverty and Transport: A Toolkit*. Overseas Development Institute.

² Carney, Diana, ed. 1998. *Sustainable Rural Livelihoods: What Contribution Can We Make?* Department for International Development, United Kingdom. See also footnote 1.

three robust groups that were used in the analysis (Main Report, para. 16). However, the areas selected for the study were those with a high incidence of poverty because of the poverty focus of the study. As such, these areas are not representative of the country 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 very small, about a third of the community. The nonpoor percentage above the poverty line in each of the three countries (top 65% in the Philippines,³ 60% in Sri Lanka, and 77% in Indonesia) averages about two thirds. Therefore, even in these high poverty incidence areas, those who belonged to the better-off group could likely be classified as nonpoor in a national sense.

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

Table A3.1: Percentage of Better Off in the Selected Communities and the Nonpoor Proportion in the Country

Location	Better-Off Proportion According to Community Definitions (%)	Nonpoor Proportion According to National Poverty Line (%)
PHI-Sorsogon Project Site	30	65
PHI-Sorsogon Control Site	20	65
PHI-Negros Project Site	40	65
PHI-Negros Control Site	10	65
SRI-Kurunegala Project Site	20	60
SRI-Kurunegala Control Site	20	60
SRI-Matara Project Site	15	60
SRI-Matara Control Site	10	60
INO-Bengkulu Project Site	25	77
INO-Bengkulu Control Site	15	77
INO-Yogyakarta Project Site	20	77
INO-Yogyakarta Control Site	30	77

INO = Indonesia, PHI = Philippines, SRI = Sri Lanka.

Sources: Study data and secondary data from National Statistics Office (PHI); based on data from Central Bank of Sri Lanka/Department of Census and Statistics (SRI); and *Statistical Yearbook of Indonesia* (1999).

6. **Relative Poverty Across Communities.** Material designation of poverty can be different in different locations of the same country. For example, in the study communities of Matara and Kurunegala in Sri Lanka, the material designation of poverty was very different. In Matara, for example, the community has a higher level of integration into the cash economy and the relative level of material goods owned, even for poorer members of the community, is higher than in Kurunegala, a more remote and isolated area lacking this integration into a cash economy. Poorer groups in Matara, however, are susceptible to other poverty dynamics that may result from this greater degree of integration and closer proximity to markets, which are 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

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

wider networks themselves bring different poverty dimensions into play. The situation in the two study areas of Indonesia is similar (Appendix 7) with differences in poverty in a relative sense.

7. **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 are 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 have different coping strategies to deal with deficits and challenges they face.

8. The poverty groups can be broken down into the following three distinct groups:⁴

- (i) **The “structural” poor or very poor.**⁵ The members of this group face structural, long-term factors of lack of access and entitlements to land and resources, which severely restrict their ability to produce beyond subsistence levels. They are most susceptible to crises resulting from natural disasters, as they have a small asset base and few networks on which they can rely for support. Often, families with a high care factor (where members are elderly, sick, or disabled) are heavily represented in this category.
- (ii) **The “transient” poor or poor.**⁶ This is a broad categorization covering a range of people who are extremely vulnerable to shocks and fall into “severe”⁷ poverty at times, but who also have some asset base or entitlements, which gives them, potentially at least, the opportunity to move out of poverty. Many may slip into severe poverty through seasonal vulnerability. Others in the top end of this bracket are progressively securing themselves against poverty by building up their asset base.
- (iii) **The better off.**⁸ These households have an income and assets beyond their subsistence needs and can be categorized as having diverse livelihood options, wide networks often extending beyond the immediate community, and a strong and diverse asset base.

9. 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 in the household survey in two ways. First, all respondents were asked the question “How would you rate your quality of life compared to 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,

⁴ The self-perception of “quality of life” classification has been used in the report when analyzing the survey data. This proved to be a straightforward measure and as effective index in evaluating poverty. The three “quality of life” strata conform very closely to combinations of other variables that have been used to verify this classification of groups.

⁵ Ranged 10–40% of households according to community definition.

⁶ Ranged 45–70% of households according to community definition.

⁷ A state where households are forced to use what little assets they have to borrow in order to meet their immediate consumption needs.

⁸ Ranged 10–40% of households according to community definition.

consumption, health, and feelings of well-being.⁹ Respondents' classifications were better than neighbors (15%), worse than neighbors (34%), and about the same (51%).

10. The information within the survey was then analyzed using a number of combinations of factors to try and build a representative "poverty index" which 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.¹⁰ Through three different sources, then, the classification of poverty groups and their approximate size were validated.

⁹ 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 this state assistance in Indonesia and Sri Lanka was often determined by political allegiance and party membership, as much as any assessment based upon need.

¹⁰ 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 and size of landholding, months of food insecurity, and materials used in construction of house.

Table A3.2: Characteristics of Socioeconomic Groups in Each Case Study Area

Very Poor	Poor	Better Off	Rich ^a
<p>Sorsogon Project Site 10%: The absolutely, chronically poor, with no land and solely reliant upon the income from daily wage labor.</p>	<p>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.</p>	<p>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.</p>	
<p>Sorsogon Control Site 10%: Similar to the situation in the project area, with this group landless and overwhelmingly reliant upon wage labor.</p>	<p>70%: As with the project area above 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.</p>	<p>20%: As above, 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 because of the area's remoteness.</p>	
<p>Negros Project Site</p>	<p>60%:^b Those who have difficulty in meeting even their daily food requirements throughout the year. Usually landless and work as a laborer in the sugarcane haciendas and as general but unskilled laborers elsewhere.</p>	<p>35%: Tenant farmers, those in business, and fixed income professionals. Skilled workers such as drivers, mechanics, and carpenters.</p>	<p>5%: Large landowners who own 80% of the agricultural land of the village, 65% of which is planted with sugarcane.</p>
<p>Negros Control Site 20%: Landless and largely jobless, with only temporary or seasonal laboring opportunities. Low level of education of household heads and large family size.</p>	<p>70%: Access to some land, upon which they plant staples for subsistence, such as corn and rice. Some self-employment in other livelihood activities.</p>	<p>10%: Those owning lands or who are professionals, such as teachers living in the area as part of their work assignment.</p>	
<p>Kurunegala Project Site 30%: Those who are landless and totally dependent upon wage labor for subsistence.</p>	<p>50%: The broadly poor who are midway between being acutely poor and comfortable.</p>	<p>10%: Comfortable through having a fixed source of income or salaried employment.</p>	<p>10%: Having a good standard of living, primarily owning a lot of land in the village.</p>
<p>Kurunegala Control Site Control area is made up of two locations due to low population in each: Walahinikalla and Wembuwa.^c</p>			

^a Some communities defined a fourth group (rich) although a few or none in their community belonged to this group.

^b Classification of the poor in 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.

^c 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% as very poor, 50% poor, and a small group (10%) as being better off.

Very Poor	Poor	Better Off	Rich
<p>Matara Project Site 40%: Solely dependent upon wage labor and with a low bargaining position, so often having to wait for full payment.</p>	<p>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.</p>	<p>15%: State sector employees, those with some form of enterprise or owning more than 2 acres of land.</p>	
<p>Matara Control Site 30%: The very poor who are solely dependent upon wage labor and, therefore, prone to income insecurity.</p>	<p>60%: The broad swathe of villages whose condition is described as average, i.e., not comfortable or secure, but not totally insecure.</p>	<p>10%: Classified as economically stable, primarily through owning tea lands of more than 2–3 acres.</p>	
<p>Bengkulu Project Site 15%: Have no land and no permanent job. They work casually as daily laborers. Have a very poor or temporary house. They do not have anything.</p>	<p>60%: Do not have permanent income sources. If they have land, the landholding is limited. Monthly income is insufficient to cover living expenses for a month. Have inadequate housing.</p>	<p>25%: They have a permanent job, they have enough to eat, and they have no debt.</p>	<p>0%:^d Their income is more than they need. They have a good house and property. They have no debt, and they have savings. They have authority in the community and people listen to them.</p>
<p>Bengkulu Control Site 25%: Household members suffering from a physical handicap. An acute lack of funds and a lack of clothing.</p>	<p>60%: Insufficient money for the family's daily consumption needs and lack of food. Bad house with bamboo floors and wall.</p>	<p>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.</p>	<p>0%: Have a motorcycle or car and a good house. Have a lot of land and savings in the bank. Have gold for wives and daughters and money to educate children at university.</p>
<p>Yogyakarta Project Site 20%: No land for farming and no cattle. House has bamboo walls and an earth floor. No material possessions like a radio, and very rarely make a trip outside the village.</p>	<p>60%: Have less than 0.5 ha of farmland, and most of the land they have is hilly. No cow or bicycle. Main occupation is farm laboring.</p>	<p>15%: Have approximately 1 ha of farmland, either paddy or plantation land. Have a well-constructed house, a cow, and maybe some goats. Also have a motorcycle and television.</p>	<p>5%: Have more than 2.5 ha of farmland, more than two cows, and often more than one good house. Have motorcycle, car, and a colored television. Have jewelry and a plantation.</p>
<p>Yogyakarta Control Site 25%: Have a very basic house, no land, and no cattle. No bicycle or radio, and no petromax lantern.</p>	<p>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.</p>	<p>20%: Have farmland of approximately 0.75 ha. Have a cow, chickens and goats, a well-constructed, permanent house, and a radio and bicycle.</p>	<p>10%: Have more than 1 ha of farmland. Many animals, a good house, radio, television, and a motorcycle.</p>

ha = hectare.

^d No villagers in the study area were deemed to fall into this category, but community was clear about what distinguishes this group. Source: From participatory rural assessment poverty ranking and definitions activities and village social mapping.

B. Key Poverty Themes Common to All Study Locations

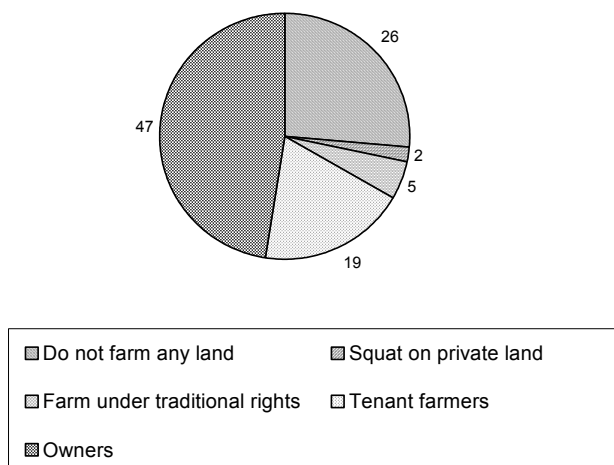
11. Research activities in all study locations revealed a number of key common themes, which condition household susceptibility to poverty. These are summarized in the following sections.

1. Resource Endowments

12. **Land and Labor.** The ability to command access over natural resources is critical in determining whether or not a household is poor. This is the case across all the study communities. Without any form of land, it is clearly difficult for households to “graduate” from poverty, as they have no capital other than their labor. Without land, most of the productive time is spent in wage labor to meet the subsistence needs of the household, and there are few opportunities to accumulate savings as rates for wage labor are at subsistence levels throughout the study locations. The situation is compounded where the educational level of household adults is low, as the potential then for engaging in more lucrative, skilled employment is 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.

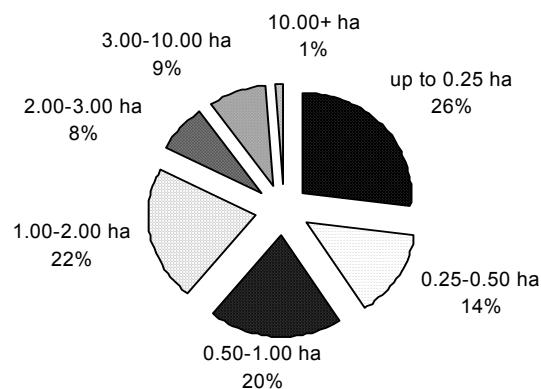
13. Among all survey respondents¹¹ in all case study areas (project and control sites), 26% of respondents do not farm any land whatsoever. Figure A3.2 shows the percentage distribution of farming activities among survey respondents. Although 74% of household farm, either their own land or land belonging to others through tenancy, a large majority (78%) also work as agricultural laborers at some time during the agricultural cycle. This is because the farmers are working extremely small plots of land that are barely sufficient to meet their needs. The size distribution of landholdings among all survey respondents can be seen in Figure A3.3. It shows that 40% farm up to 0.5 hectare (ha) and 60% up to 1 ha. Among the very poor (50%) farm, less than 0.5 ha and 75% farm less than 1 ha.

Figure A3.2: Distribution of Farming Activities



Source: Household survey data.

Figure A3.3: Size of Landholdings



Source: Household survey data.

¹¹ The terminology “all survey respondents” is used to reflect all project and control site groups in all three countries.

14. **Livestock.** Animals, are an important source of livelihood security in all of the project locations, and are also a principle source of income in some areas. Ownership of livestock is, therefore, a critical socioeconomic indicator. For the poor and very poor, small animals act as both savings and investments and are usually sold to meet a short-term need for capital to overcome some difficulty or crisis, such as the costs for medical treatment of a sick family member.

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

2. Debt Cycles

16. The level of household indebtedness is a key poverty indicator. Many poorer farmers and wage laborers in the study communities are heavily reliant upon credit extended by agricultural middlemen and moneylenders in the community. Tenants and poor farmers borrow money against the next season's crop, at times of the year when they are most vulnerable. Middlemen consequently dictate the price, at which this debt is relieved, and often the households cannot pay off the debt from one crop. Hence, a debt cycle develops. For middlemen, this system ensures their supply and enables them to dictate the price at which they buy. Indebtedness also compels the poor to sell any surplus they have immediately upon harvesting, at a time when the price is likely to be at its lowest point. Those dependent upon wage labor also get credit from large landowners for whom they work regularly as a means of overcoming periodic crisis and food shortfalls during the off-peak agricultural season. Credit from landowners to laborers ensures a labor obligation in the future when they will most need it, during peak harvest times, when labor might otherwise be difficult to get. 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, middlemen 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 further markets, where prices for crops may be better, because they are "locked" into relationships of debt from which they cannot easily escape.

3. Family and Community

17. **Household Size and Composition.** In all of the study locations, there appears to be a high correlation between large family size and poverty. Whether having a large number of children is a symptom or cause of poverty is a moot point, but 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.

18. **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 show 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.¹² 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. When longevity of residence across a number of generations is combined with available family labor, this would appear to be a successful remedy in enabling the family group to move from poverty (Appendix 8, Box 9).

¹² In many of the study locations, extended families would live 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.

STUDY ROADS, PROJECT SITES, AND CONTROL SITES

A. Sorsogon Integrated Area Development Project (SIADP)—PHI

1. **Sorsogon-Philippines, Bulan-Magallanes Road.** This road segment is 21 kilometers (km) long, connecting 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 has been a moderate increase in the volume of 3-wheelers and they have replaced jeepneys, the previously dominant transport mode. Though the cost of using a 3-wheeler is higher, they are more popular due to short waiting times. Competition has kept transport prices below the rate of inflation in gasoline prices in recent years.¹ However, the increase in traffic volume has not been as large as anticipated at project design stage, but villagers in Palale have benefited from more regular transport and reduced traveling and waiting times.



Sorsogon Study Road—PHI



Sorsogon Control Site Access—PHI

2. **Sorsogon Study Areas.** The Sorsogon project site (Barangay² Palale) and the control site (Barangay Bical) had similar socioeconomic profiles. The main production in both is coconut, with little else existing as a cash crop. The traditional abaca production had failed in late 1990s due to bunchy-top disease, a problem throughout the Sorsogon area. There is a noticeable lack of intercropping in both areas, though there is some banana production. Both communities are consequently heavily dependent upon the price of copra. Much of the copra is sold to a dealer in the nearby center of San Francisco, midway between Palale and Bulan. There is a high concentration of land ownership in both the project and control locations, with the majority of local inhabitants being either tenant farmers of large landowners or agricultural wage laborers. Households are closely associated through kinship. As in many other areas in the Philippines, both project and control sites have their own elementary school within the barangay although facilities are inadequate. In terms of accessibility, the sites are different. While Palale is on the study road 10 km from Bulan town, Bical is 30–40 minutes walk from the nearest road, which is a further 3–4 km from the study road. Access between Bical and the roadhead is by track, with agricultural goods and other larger items transported by buffalos. Access to Bical is over two rivers without crossings and during the rainy season, these rivers

¹ See the Philippine country report for a fuller discussion of this issue in regard to the Bulan-Magallanes Road. ADB. 2002. *Philippine Country Report: Impact Evaluation Study of Rural Roads on Poverty Reduction*. Manila.

² A barangay is the smallest administrative unit locality in the Philippines. It is headed by a barangay captain who is elected by the community for 2–3 years.

flood and the barangay center becomes inaccessible. Palale has a protected tap water source, but water quality is an acute problem in Bical, particularly during the rainy season, because open wells and rivers are the main sources of water. Unlike high schoolers in Palale who have year-round access to the high school on the project road, Bical high schoolers have difficulty of access during the rainy season.

B. Fifth Road Improvement Project (FRIP)—PHI

3. **Negros-Philippines, Moises Padilla-Guinpana'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 links the national highway with Canla-on City after rehabilitation. It is now used as a bypass 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 means that villagers have benefited from reduced transportation costs, both for local travel (motorcycles and 3-wheelers) and for longer distance travel (buses) from nearby centers. Villagers overwhelmingly classified the available transport services as “good” in the study passenger survey.



Negros Study Road—PHI



Negros Control Site Access—PHI

4. **Negros Study Areas.** The Negros project site (Barangay Magallon Cadre) and control site (Barangay Macagahay) are similar in their sociocultural backgrounds and asset holdings. However, accessibility constraints resulted in their agricultural production being different. Project site production is overwhelmingly sugarcane. A large proportion of the study community works in the haciendas, providing seasonal labor to large absentee landowners of these estates during the peak season (October to February); at other times, employment is scarce. The dominant form of production in the control site (Macagahay) is corn for subsistence food needs. Opportunities are sparse due to the poor terrain and long distance to the road and other settlements. Sugarcane is not grown due to the absence of a road network. There are schools in both areas and a health center in the project site. In terms of accessibility, the sites were quite different. Magallon Cadre is located 3 km from the national road junction along the project road, and the community enjoys ready access to the nearby town center where there is a market. The control site is separated from the road by a large river. It is accessible over a footbridge or by boat. The center of the barangay is a further 45-minute walk through steep terrain. During the rainy season, the control site is isolated and travel becomes dangerous. Its nearest market

center is on the other side of the river where the control site villagers buy and sell commodities during market days and access the health center.

C. North Western Province Water Resources Development Project (NWP-WRDP)—SRI

5. **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 has been particularly important in guaranteeing all-weather access along the link. The road section is in good condition, perhaps due to the severe lack of rain over the past 3 years. Due to frequent overspilling from irrigation tanks, accessibility was difficult before rehabilitation. Bicycles are the main means of transport along the road with a few 3-wheelers, which come only on request. The main public form of transport is the state bus service and by hand tractors when needed. The road rehabilitation has improved the regularity with which the bus comes, as it is no longer hampered by seasonal access difficulties. Motorcycle and bicycle traders collect fish and milk from the villages and transport them to nearby areas.



Kurunegala Study Road—SRI



Kurunegala Control Site Access—SRI

6. **Kurunegala Study Areas.** The project site (Nugannoruwa) and control sites (Walihinikalla and Wembuwa)³ are similar in socioeconomic profiles. Rice production is dominant. Other crops are grown in traditional drylands and the communities increasingly rely upon cattle as a source of livelihood due to a water shortage that has prevailed over the last 2–3 years. In both sites, most of the paddy fields are dry, with just one area fed by a tank with sufficient water for one crop per year. Production potential is somewhat better in this control site than in the project site because of greater water availability in the control site, which is why people continue to live there despite accessibility constraints. The people in the other control site Wembuwa moved to the area 15 years ago. There are strong social ties of marriage and kinship within each village. The school used by all the sites is in an adjacent village, and the health facilities are at the nearby town of Nikaweratiya. Access to the project site and control sites is quite different. The project site village is adjacent to the study road halfway between the provincial road and the irrigation tank. Both control communities are, however, more than

³ Due to low density of population in the control sites, two sites were selected to allow a sufficient number of households to participate in the survey (Appendix 6).

45 minutes from a bus route on the study road. Despite this, control site villagers have to access the same community hall, schooling, and health facilities when needed, but must first access the road via the project site. Wembuwa, the other control site, lies at the end of a motorable track, which then branches off into a series of footpaths. The main access to the study road is across the fields and along a nearby tank bund.

D. Southern Provincial Roads Improvement Project (SPRIP)—SRI

7. **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 SPRIP in 2001, and is currently in good condition. There is evidence of a substantial increase in traffic volume along the road, and of roadside development (green-leaf tea collection centers, small stores). The much heavier volume of traffic here (than on Kurunegala project road) is partly because the road now serves as a bypass between the two parallel road networks, with larger trucks and goods vehicles taking advantage of the better surface. The villagers prefer motorcycles to bicycles because of the steep gradient. The high integration of this area into the cash economy means that some households have motorcycles. A bus and a minibus offer public transportation services. A new state bus service is also planned. Modified trucks transport tea estate workers to the estates. Since the rehabilitation, the transportation price on 3-wheelers has fallen by half due to a better road surface and increased competition.



Matara Study Road—SRI



Matara Control Site Access—SRI

8. **Matara Study Areas.** Both project site and control sites are very similar in their socioeconomic profile with tea as the main product in both project (Heegoda) and control sites (Makiliyathanne). There is some spice production. Conditions are good for lowland green-tea leaf production, and there is a high level of commercialization and integration into the cash economy. Villagers are either smallholders of land or work in the commercial tea-growing plantations. The poor in both areas work in the tea plantations. There is a fluidity in the concept of the village here in both sites, with few villagers sure of which village they actually belong to. There are no community organizations in either site though there are strong social and family networks in operation. The nearest school to both areas is on the main road through Heegoda. Accessibility though is very different in these locations. While the project site is adjacent to the road, the control community lives on the upper slopes on either side of the study road and is accessible by long winding stone paths, which cut across the slopes. The villagers in Makiliyathanne are very conscious of the difficulties they face without road access; they use the

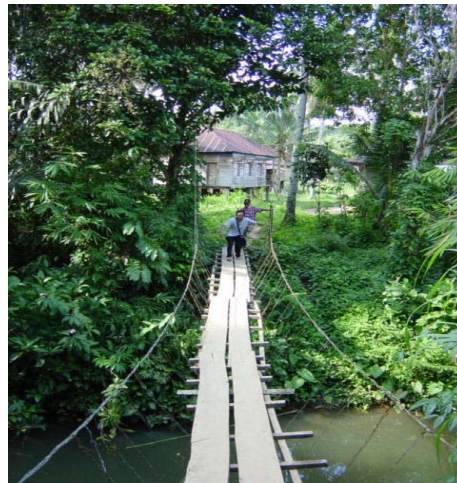
same services and institutions as the project site villagers, but feel the benefits of the road beneath are passing them by. Due to the steep track access, everything has to be headloaded, because even tractors get stuck on their access path.

E. Tree Crop Smallholder Sector Project (TCSSP)—INO

9. **Bengkulu-Indonesia, Talang Padang-Tanah Abang Road.** The TCSSP 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 was established in 1993, and was built by a farmers' group, and initially at least, maintained by them. However, this group stopped maintaining the road after a few years, as the members felt that the benefits received from these types of plantation roads were not commensurate with their efforts in maintaining them. Their decision also coincided with the decline in intercropping as the rubber trees matured. The plantation roads have now reverted to basic access tracks. To be comparable with other communities studied, the community adjacent to a plantation road and the asphalt road (16 km) linking the plantation road to the main road was considered as the project site. This link road has a close connection to the TCSSP plantation roads. It was asphalted by the provincial government in 1996 in response to farmers' requests for a better road to complement the TCSSP project activities. The area is remote and much of the travel local. Since the asphaltting, a regular bus and minibus services run to Bengkulu, the provincial capital. The speed of travel and thus time saved have also increased markedly since rehabilitation.



Bengkulu Study Road—INO



Bengkulu Control Site Access—INO

10. **Bengkulu Study Areas.** Villagers in both the project site (Talaatan) and the control site (Talang Padang) are smallholders of land and the poorer families also work as agricultural laborers, fisherfolk, take up basket weaving, or collect forest products. Crops in both sites include paddy, corn, cassava, sweet potatoes, groundnut, and soybean. Tree crops include rubber, coffee, coconut, jackfruit, and durian. Accessibility is very different in the two locations. Talaatan is next to the district road, and the villagers there use public transport to go to the weekly market or to the provincial capital. The control site is completely inaccessible by road as it lies on an island surrounded on all sides by a river. Access is either across the river or via a small suspension bridge. During the wet season, the river can swell and wading across is not possible. The village extends to the banks on the other side, and access from there to the

nearest road is along a track and then on through farmland to the road. Although the road is motorable by 4-wheel drive during the dry season only, the conditions are very difficult and there are no transport operators servicing the village.

F. Third Local Roads Project (TLRP)—INO

11. **Yogyakarta-Indonesia, Semanu-Giri Panggung Road.** The TLRP 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 at approximately 4 km along the road. There is a higher level of motorized transport on this route compared to the other study areas, minibuses being the predominant mode. Bicycle use is very low, perhaps due to the terrain. Since the rehabilitation of the road, a high frequency of transport services has developed, with a consequent decrease in waiting times. Decreased traveling times are also evident.



Yogyakarta Study Road—INO



Yogyakarta Control Site Access—INO

12. **Yogyakarta Study Areas.** The study areas are similar in terms of physical aspects, geography, topography, agricultural 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 sloped. The condition of the soil is very poor with a major portion of the land classified as unfertile. The majority of cultivation in the area is dryland rice and cassava, which is intercropped with groundnuts and some banana. The rocky land topography in some places makes agricultural production difficult, and water is a real problem throughout the region. The main occupations among villagers are a mix of smallholder farmers and farm laborers. Most of the villagers have “noncertificate” status of land ownership. The accessibility is 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 have to walk along a rocky road and pathways to reach the central village.

CASE STUDY DETAILS IN THE PHILIPPINES

A. Introduction

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

1. Sorsogon Integrated Area Development Project

2. **Description of SIADP.** SIADP is located in Sorsogon Province, Bicol Region, which is one of the least developed regions in the Philippines with a 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 included five components: (i) improvement and rehabilitation of 215 kilometers (km) of provincial and 94 km of farm-to-market roads; (ii) rehabilitation of 15 communal irrigation systems and construction of flood-control facilities; (iii) health services through schistosomiasis control and provision for water supply systems; (iv) support services for agriculture and fisheries, including abaca rehabilitation, plant nurseries, and artificial reefs; and (v) project management and training.

3. 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 humans. 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: (i) access to high-density population centers, (ii) access to areas where project production program were being implemented, (iii) transportation of products to markets, and (iv) access to agricultural and fisheries production areas.

4. The executing agencies and the subcomponents for which they were responsible are as follows: (i) Department of Public Works and Highways for road improvement and rehabilitation and flood control; (ii) National Irrigation Administration for the rehabilitation of communal irrigation systems; (iii) Department of Health through its district office in Irosin for schistosomiasis control; (iv) Department of Agriculture for abaca rehabilitation extension support and artificial reefs; (v) Sorsogon Provincial Governor for domestic water supply; and (vi) Office of the Provincial Agriculturist for plant nursery establishment. SIADP was completed in December 1997.

5. **SIADP Setting.** Sorsogon Province is at the southernmost tip of Luzon Island. A main road artery, the Maharlika Highway, connects the province to the other provinces and to the southeastern tip of the province, where ferry boats operate. It occupies an area of 214,145 hectares (ha), largely of volcanic cores interspersed with broad and level farmlands. 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 shows that about 151,000 ha are planted with coconut, rice, bananas, root crops, corn, etc. However, despite a large cropped area, output for key crops fall short of the consumption levels in the area. About 75% of its total population (0.6 million) are in rural areas.¹ The average annual per capita income of Sorsogon in 1997 stood at ₱18,032, with a huge variance between the lowest average level (₱3,546) against the highest average level (₱101,755). The poverty threshold in Sorsogon for the same year was ₱7,760.²

¹ National Statistics Office. May 2000.

² This compares with ₱8,319 for the entire Bicol Region in which Sorsogon Province is located.

The percentage of the population below the poverty threshold in Bicol Region increased from 55.0% in 1997 and 62.2% in 2000 and Sorsogon experienced similar pattern. The unemployment rate for Sorsogon in 2000–2001 was 18.2%.

6. School participation rates in Sorsogon are high at 97.7% and 70.7%, respectively, for elementary and secondary levels. Generally, the health situation in Sorsogon improved in 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 the 3% in 1990. The better health status of the people in the area is attributed to improved health facilities. Inadequate transport facilities such as roads and bridges to connect production centers to markets remain one of the major constraints in the overall development of Sorsogon Province. The current state of roads varies considerably from very good to very bad condition, with most in bad condition. The province has approximately 1,429 km of roads. The number of vehicles registered in the province increased from 7,470 units in 1997 to 10,707 units in 1999. The selected Bulan-Magallanes Road connects two urban centers and the municipalities of Bulan and Magallanes.³

2. Description of the Study Areas in Sorsogon

7. Among the 15 road projects under SIADP in Sorsogon, the Bulan-Magallanes Road was selected for the study. Selection of these project sites 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 project and control areas.

8. **Bulan-Magallanes Road, Sorsogon.** The Asian Development Bank (ADB) supported the rehabilitation of 21.12 km of road out of 26.77 km of total road length from Magallanes to Bulan as the remaining stretch between Bulan to 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. Currently, the Bulan-Magallanes Road has a 10 km concrete section from Bulan to Barangay Palale and carries largely local traffic. It has 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 follows the ridge alignment. Therefore, the numbers of cross drainage structures are only few and there are almost no retaining walls. There are six bridges with a span of 15–25 meters (m). The side slopes of the road are fully covered up by vegetation, therefore, no soil erosion was noticed. The quality of the study road is 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 current level of traffic. With the shoulders of the road not filled, there is 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 is appropriate for tricycles (motorcycle-drawn sidecars). As a result, the majority of the tricycles operate on both sections that are paved with reinforced concrete.

³ Municipalities in the Philippines are not necessarily confined to urban areas.

9. **Sorsogon Project Site.** Barangay Palale is approximately 10 km north of Bulan Municipality and has one administrative *sitio*⁴ 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 volume 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



Transporting forest products from Patag to the roadhead

ended due to disease. Currently, the Government is encouraging a new crop (*pili* nut) to minimize overdependence on coconut. There is an elementary school in Palale, but the roof leaks severely during rains. Although Palale has a level 2 water supply (tap in the village), about 20–30 households are facing difficulties in accessing water. The village has no market. There are only two small convenient (*sari-sari*) stores mainly carrying the basic food requirements of the households in the village. Villagers have all-weather access along the Bulan-Magallanes Road. The barangay road leading to sitio Patag is no longer passable by motorized vehicles. Farmers in the village either have to transport produce from Patag manually or use a buffalo (carabao) to the roadhead. Most tenant farmers are obliged to sell the copra to their landowners who give them credit in

times of need. Even others who do not have this arrangement still find it hard to sell copra in an “open” market, as the local trade is controlled by a small number of copra dealers.⁵ The ability, then, of local tenant farmers to take advantage of any potential increase in opportunity for trade is severely restricted by the manner in which they are locked into local relationships, primarily of debt.

10. **Sorsogon Control Site.** Barangay Bical is one of the most inaccessible settlements of Bulan Municipality. Village access is via tracks to the roadhead of about 40 minutes walk. From the roadhead, tricycles can be caught to the main Bulan-Magallanes Road. As a conflict-torn area, Bical has 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 may be beyond the means of most households. Like Palale, the village economy depends heavily on coconut production. The village has a total land area of 455 ha and a population of 96 households and an elementary school. The water supply is level 1 (open source, spring, or river). There are only few middle traders at the road junction. But most farmers continue to Bulan or San Francisco to market their goods. The dealer in San Francisco buys a large portion of copra from the area. The village has no public market. There are only two small *sari-sari* stores carrying basic food requirements of the households.

3. Fifth Road Improvement Project

11. **Description of FRIP.** 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. FRIP comprised (i) civil works for improvement of about 420 km of national roads and 420 km of rural roads in 11 provinces; (ii) periodic maintenance of both rural roads in the same 11 provinces; (iii) consulting services; and (iv) a project benefit monitoring and evaluation study for the Third Road Improvement Project. The

⁴ A part of a barangay.

⁵ In addition to the indebtedness, the lack of drying and storage facilities also affects the price that farmers can demand.

EAs 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.

12. **FRIP Setting.** Among the 11 provinces covered under FRIP, Negros Occidental (West) Province was selected for the case study. It is located in the northwest portion of Negros Island within the Western Visayas or Region VI. 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 rice at 28%. The minor crops are corn, coconut, banana, cassava, and mango. The province had a population of 2.5 million (National Statistics Office, May 2000) and is expected to reach 2.8 million in 2002, with 52% living in rural areas. Population density was 284 in 1990 and is expected to reach 361 persons per square kilometer in 2002. In Negros, 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 can serve only 7 out of its 15 barangays throughout the year, which are all situated in the town area. Other barangays are mainly dependent on deep and artesian wells for their water supply. The predominant dialects of the area are Hiligaynon, Cebuano, and Caray-a.

4. Description of the Study Areas in Negros

13. **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 and 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 starting at the junction and becoming rolling hills, and then 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. Nonetheless, 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 is still good 6 years after rehabilitation. The road is underdesigned for the current traffic load and volume. There is a good supply of transport vehicles for local needs of villagers in Barangay Magallon Cadre, especially tricycles, as it is between two markets. There is high connectivity of barangay roads to the main



Tricycle on study road in Negros

roads, but these are 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.

14. **Negros Project Site.** Among 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 away from Moises Padilla and 86 km away 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) dominates the landscape of the village. Magallon Cadre has a total land area of 2,490 ha and a population of 616 households. Out of its total land area, about 52% is planted with sugarcane followed by rice (27%); social structures such as school, playground, and houses (11%); and cash crops and trees (10%). The concentration of land ownership is particularly acute. Most of the inhabitants in the project site are employed in the haciendas of large landowners, and most of the villagers themselves have no land. Even the lands for

settlements along the road belong to the hacienda. Residents are, therefore, required to work in the hacienda system for wage labor at peak periods in the agricultural season. Since they have no land and few other productive assets with which to diversify livelihoods, they become locked into a continuing relationship with the hacienda. Since haciendas are the primary source of employment for the villagers, the majority of its workforce are sugarcane workers. A daycare center, two kindergartens, and an elementary school are available to the villagers. There is a barangay health center, which mainly provides maternal and child care services. The village has no public market, but there are about 20 small sari-sari stores to cater to the basic requirements of the households in the area. Despite ready access, only one third of all the households have electricity connections.

15. **Negros Control Site.** Barangay Macagahay was selected as a control area. Access to the village is through Barangay Montilla, another barangay of Moises Padilla Municipality. A big 30 m wide river, Binalbagan River, 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 takes about a 30–45-minute walk for the villagers to reach the village proper, while the other route over the floating bridge is another 20–30 minutes of extra walk to reach the village center. Barangay Macagahay has seven sitios. It has a total land area of 2,742 ha and a population of about 335 households. Settlements in Macagahay are sparsely distributed. About 83% of its total area is considered mountainous. During rains (typhoons), Barangay Macagahay is completely isolated as it is extremely dangerous for villagers to travel due to difficult terrain. Due to the absence of a road network, sugarcane is not grown in the village and a considerable number of bamboo trees also mature without being harvested every year. The main production is staple crops: irrigated rice (15 ha), rainfed rice (40 ha), and corn (300 ha).

16. There is no public market in the village and the market center in Montilla is the nearest. Since the health center in the village has inadequate medicine supplies, villagers go to the adjoining village. Also, the two schools in the village have to merge classes due to lack of classrooms and teachers. Extension workers are rarely visible in the village due to considerable difficulty in reaching the area.



Transporting goods across the river in the Negros control site

B. Transport Situation

17. **Sorsogon Project Site.** The Bulan-Magallanes Road is passable throughout the year with the majority of villagers claiming that the condition of the road is better now than 5 years ago. 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 the use of motorized traffic would increase in volume. Similarly, the *banca* traffic would then be diverted to the road. The present volume of average daily traffic (Appendix 1, Table A1.1) shows a low volume. The existing projection on traffic data is not directly comparable with the 2002 data.⁶ Other routes that have opened up since then and

⁶ This 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 am to 4 pm instead of 6 am to 6 pm as in the other study locations for security reasons. There were no market days during the 2-week study period.



A jeepney carrying passengers and freight on Bulan-Magallanes Road

the failure of abaca production and the poor copra market may have affected the expected traffic growth.

18. Only jeepneys and tricycles operate along the Bulan-Magallanes Road with jeepneys servicing only part of the study road. There is no fixed time for jeepneys to operate because they wait for about 30 passengers to get in. Tricycles wait for at least seven passengers for them to operate. The tricycles can carry up to 20 passengers (children) or the equivalent load of commodities. The frequency of tricycle trips is higher during morning and late afternoon, and very low during the rest of the day. Both types of vehicles do not operate if they do not get a minimum number of passengers or freight. However, there is unsatisfied demand during peak hours. The area generates a higher volume of trips during August to December harvesting months. To meet demand, transport operators add 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 ₱8.⁷ 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 to three tricycles were servicing road segments, but now there are 15. However, the full savings in the vehicle operating costs are not

transmitted to the passengers immediately.

19. Apparently, availability of better road and transport services contributes to the commercialization of farm production in the village. Almost all of the households that farm in the village sell their crops. Nevertheless, the majority maintain that they are selling a lower percentage of their produce now than 5 years ago. This implies that the presence of better road and transport services are not sufficient conditions for villagers to achieve higher farm productivity. They are selling their farm products at the market or to local merchants. Most claim that there is no change in the number of agricultural buyers visiting their village now compared to 5 years ago. The declining pattern may be because some producers are taking their produce directly to the market and partly because of a declining market for copra. The villagers' preferred mode of transporting products to market is tricycle.

20. All travel movements near and within the village are by foot except for visiting a local healer or a health facility when adult women use a shared taxi. Adult men predominantly travel locally to visit fields for crop production, collect water and fuelwood, and process agricultural products. The adult women's local travel is 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 are done by shared tricycle. Adult men travel mainly for processing agricultural products, selling their harvests and other products, and securing documents from the state office. Adult women travel primarily for buying provisions for their family's needs and securing medical assistance from sources outside the village. Some adult women travel outside their village for business or employment purposes. Male and female children travel outside the village by shared taxi mainly for attending school on weekdays.

⁷ If inflation for tricycles and withdrawal of the gas subsidy are factored in the present tricycle tariff rate, the fare should have reached more than ₱14 for tricycles; the jeepney fare should have been more than ₱11 in 2002.

21. There appears to be no difference in purpose of travel within the village between the different socioeconomic groups but the mode of travel is different. The poor and very poor travel on foot whereas the better off use a tricycle sometimes, saving time on routine tasks. Outside the village, the very poor and poor travel primarily to buy provisions, while the better-off households travel for processing and marketing agricultural products. Overall, the adult men undertake productive tasks related to income-generating activities, while the adult women do household tasks except for few who are engaged in business/employment. The area has a mobile shopping facility that vendors visit once a week and sell daily food necessities to the poor. There is also a local government mobile clinic along the Bulan-Magallanes Road to provide emergency medicines and treatment for common illnesses. The villagers benefit from the easy access from this, and the lower cost of medicine due to savings in transport cost. Better roads and more available transport services have increased the mobility of teachers, health workers, and extension workers, allowing them to provide services to the villagers. It also enables 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 have greatly contributed to the sociopolitical participation of villagers. In the 2001 local elections, a high voter turnout of 95% of the voting population is an indication that villagers are aware of their roles in community management.

22. There is no organized transport association for operators along this route. There are three institutions directly involved in regulating and licensing the operation of transport services. Issuance of vehicle registration and licenses is the responsibility of the Land Transportation Office. The Land Transportation Franchising and Regulatory Board administers the franchising of routes. For jeepneys, the process involves a court hearing and payment of an application fee of about ₱3,000. Jeepneys can operate up to 65 km. The license to operate tricycles is administered by the concerned municipality. At present, the Provincial Engineer's Office maintains the road because it is categorized as a provincial road. It sends a maintenance crew with the required construction equipment. Therefore, there is no employment generation opportunity. A majority of villagers are not prepared to contribute to the future maintenance of the road, but those who are willing would prefer to contribute their labor. National and local authorities feel 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.

23. **Sorsogon Control Site.** The only village access is via tracks to the roadhead of about 40-minutes' walk across two rivers. Bical villagers currently carry medical patients in an abaca stretcher to the nearest road to be transported to the clinic or hospital. Consequently, home births are common in Bical. Despite the absence of better road and transport services, agricultural production in the village is commercialized. All the farming households claim that they are selling almost the same percentage of their produce now as 5 years ago, but most say more agricultural buyers visit their village now compared to 5 years ago. As most farming households have difficulty in transporting their produce, they sell it at lower prices to agricultural buyers visiting their village. Those selling directly to the market transport their products on foot or with an animal, and then transport further by tricycle or with an animal.



Tricycle taxis waiting for hire at Magallanes

24. Within the village household, daily travel activities are all done on foot similar to Palale. Responsibilities for transport are also similar. The shared tricycle is the most common mode of transport for activities done outside the village. In addition, villagers also transport their agricultural

products to the market to seek medical assistance on carts drawn by buffalos. Because of the lack of road access, villagers spend too much time moving from one place to another to carry out their activities. On average, villagers spend about 2 hours to accomplish a task involving travel outside the village covering a distance of about 20 km. As in Palale, there seems to be no difference in travel within the village between the very poor, poor, and better-off households. Purpose of travel patterns across socioeconomic groups are also similar to Palale as are the gender differences in transport responsibilities. The very poor and poor households travel on foot due to their lack of access to animals. They spend more time reaching the roadhead compared to the better off. This reduces substantially the time that the very poor and poor households may spend on productive activities, adversely affecting their income-earning capacity. In the 2001 local elections, voter turnout was 91%. A majority of villagers are willing to contribute to the maintenance of a future road through provision of labor.

25. **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 is fast, 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 are in a bad condition. Transport availability is not significantly affected by changes in season, as several alternative means are available. It is better now than 5 years ago. The average daily traffic passing through the study road substantially increased from about 300 in 1990 to nearly 1,000 in 2002. All types of vehicles are 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 are the most used mode of transport followed by tricycles. Trucks are used mainly for transporting sugarcane. The volume of traffic is high in comparison to the Bulan-Magallanes Road in Sorsogon. Most of the motorized vehicles originate from Bacolod City and the road appears 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. The direct route to these cities is in poor condition. Therefore, the vehicle operators prefer 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" with reasonably large and comfortable buses plies the Bacolod to Canla-on City route every half an hour. Other minibuses operate every half hour from Cabacungan to Bacolod and vice versa. This means that long-distance transport services are available every 15 minutes along the study road. On the other hand, tricycles are available as and when necessary. Out of 300 tricycles in Moises Padilla Municipality, one third are owned by the drivers themselves, and two thirds by nondriver owners.

26. There was a reduction in the vehicle operating costs 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 ₱35 (before rehabilitation) to ₱40 in 2002 (6 years after rehabilitation).⁸ According to government norms, a transport vendor can raise fares up to ₱0.90 per km for a passenger. It means the bus operators can collect up to ₱85 per person for a road length of 94 km from Bacolod to Cabacungan. Nonetheless, they are charging only ₱40. Therefore, the savings in the transport costs are passed on to the passengers. It appears that availability of better road and transport services contributes to the commercialization of farm production in Magallon Cadre. All farming households sell some of their agricultural production. The majority of farming households are selling a higher percentage of their produce than before, and they have more buyers visiting the village now than 5 years ago. About 82% of respondents using transport services say they are good and a further 4% report them as fairly good.

⁸ If the nominal tariff rate had increased in parity with the gasoline price, it should have been ₱99.

27. Most villagers buy their household provisions and agricultural inputs from the public market center in the town of Moises Padilla and sell agricultural products in this market. They normally use the medical facility available in the town. A minor health treatment facility is available in the village itself. There are employment opportunities, though limited, in the town. Since Magallon Cadre has only an elementary and intermediate level educational facility, high school or secondary level students must travel to the town. Beyond secondary level, the students have to travel to Bacolod City or other larger cities. Nevertheless, most of the transport demand of the local people is within the municipality, especially for the poor, and is met by an abundant supply of tricycles. Bacolod City serves as the regional market center for business people, and the town of Moises Padilla serves as the local market center.

28. The pattern of local household travel within Magallon Cadre shows that most households travel on foot as they perform their daily activities. The patterns of household travel outside the village are also similar in responsibility and task to Sorsogon. On average, outside travel of the villagers covers a distance of 5 km requiring only 12 minutes. Moreover, the transport fares incurred in accomplishing the regular activities are relatively stable at ₱10 per return trip. Travel patterns by socioeconomic group are also similar to Sorsogon. Within the village, all groups have similar travel needs. However, most poor households who travel outside the village restrict themselves primarily to buying provisions to meet subsistence needs, while the better-off households travel for processing and marketing agricultural products to generate more income. As most of the poor households are situated far from the road, they have to spend considerable time to access the transport services along the road. As in Palale, better roads and more available transport services increase the mobility of teachers, health workers, and extension workers, allowing them to provide efficient and effective services. There was a 94% voter turnout in the 2001 local elections.

29. 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 has determined the fare rate at ₱0.90 per km for buses. The Land Transportation Office undertakes the licensing of the vehicle driver and vehicle registration. The local municipal government administers the licensing of the tricycles. The registration fee for a tricycle is ₱300. The issue of traffic accidents falls under the jurisdiction of the traffic police. In addition to the formal regulations, the large transport operators like Ceres Liner have developed their own policies on the number and frequency of services according to the transport demand. The United Negros Drivers and Operators Center also makes decisions on the queuing system. Since this is classified as a provincial road, the Project Engineer's Office undertakes routine and periodic maintenance work. The maintenance activities generate limited employment for the local people. Considering the volume of traffic it handles, this road functions 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 are already visible in a number of locations along the study road. Understandably, villagers are not willing to participate in the maintenance of a road that is used mainly by outsiders.

30. **Negros Control Site.** Although Barangay Macagahay has no road access, it appears that this is not a major constraint in the commercialization of agricultural production. They are selling a higher percentage of their produce now than 5 years ago. They are selling primarily their farm products to visiting buyers in the village because most of them have difficulty in transporting their agricultural products to the markets. Most of the villagers who are



Waiting to transport goods that were manually brought from Negros control site

selling directly at the market are transporting their products manually and upon reaching the roadhead, they reload their products in tricycles or in buses/jeepteys or use 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 provides an opportunity to the poor to be hired as porters of agricultural products from the village to Barangay Montilla. They are usually paid ₱10/sack of 25 kilograms of charcoal, banana, camote, and cassava and ₱10 per pole of bamboo.

31. There is minimal travel movement of households outside the village. No one travels outside the village to undertake processing agricultural products, to transact business or for employment, or to attend classes. Minibus is 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 travel outside their village to buy provisions for their family and to sell harvests or other products. Adult men and adult women travel together to procure and secure medical needs of their family and documents at the municipal office. On average, one has to travel about 25 km and spend 2.3 hours to perform a task in the town. Since traveling outside the village is very costly involving an average expense of ₱32 for each return trip, villagers schedule trips outside their area once every 2 months. However, a lack of transport services has not constrained the villagers from participating in the 2001 local elections as shown by the 93% voter turnout. Most villagers are not prepared to contribute to maintenance.

C. Poverty Situation

1. Common Characteristics

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

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

34. Most farming households claim that there are no changes in size of farm area, or in the amounts and types of crops that they have been growing over the last 5 years. In general among all socioeconomic groups, about half of the household income is spent on food and about 6% on transport and 6% on education. However, the very poor and poor households spend at least 65% of

their income on food and this can go up to 80% in the control areas where scarcity of opportunities is higher. This prevents them from building up their financial capital to invest in productive endeavors. Most villagers claim that there has been no change in their income sources over the past 5 years. They would like to increase their income through raising animals or starting a small business. However, this opportunity is beyond the reach of the very poor and most of the poor households in the village, as the initial capital required is high for animal raising. Without access to credit, they cannot find the start-up capital. Most of the very poor households mainly raise 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 are those with adequate education and skills and are mainly from better-off households. Opportunities that exist are 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 are biased against women.

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

2. Sorsogon Project Site

36. In Barangay Palale, the villagers classify the socioeconomic groups as very poor (10%), poor (60%), and better off (30%). The primary occupation is agricultural wage laborer (50%) for most households and others (26%) are coconut farmers. As harvesters and processors of copra, laborers work for a daily wage rate (₱100/day). The 2-month cycle of copra creates an income gap in between months for the very poor and poor households. A high percentage of average household income of villagers is spent mainly on food (54%); the very poor and poor households spend at least 65%. About half the households (57%) have private toilet latrines, but most of the very poor households have no toilet facilities and use open fields.

37. Most of the farming households are tenants farming over 1 ha of land and growing coconut. Farming households have sufficient family labor and do not need to hire, resulting in even fewer opportunities for the very poor. Banana and some root crops are also grown. There have been no changes in size of farm area and the amount of crops that they have produced over the last 5 years. This development has negative implications on the earnings capacity of the very poor and poor as well. As little capital is flowing into the local economy, the poor are 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 collect and sell 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 are unable to maximize the impact of these services as they have limited money to buy adequate amounts of food for their needs as they need to pay in cash. By self-assessment, most of the households consider themselves having the same quality of life as their neighbors (49%), 29% consider their quality of life as worse than their neighbors’, while 20% feel they are better off.

3. Sorsogon Control Site

38. The poverty situation in Barangay Bical is more severe than in Barangay Palale. They consider 10%, 70%, and 20% as being very poor, poor, and better off, respectively. In Bical, similar to Palale, agricultural wage laboring (66%) is the primary occupation but in contrast, the primary occupation of the spouses of household heads is not farming but also working as a wage laborer. This is an indication that poverty is more intense in Bical with more households not having a regular income stream. As their mobility is highly confined in the village, the very poor and poor have difficulty in scouting for job opportunities that may improve their income capacity. The farmers generally cultivate over 1 ha of land under a sharecropping arrangement with owners. In contrast to Palale, the majority of the households in Bical are collecting forest products for sale. The primary forest products are traditional plants. The abundance of these forest products helps the very poor and poor households in bridging the gaps in their income due to seasonality of copra production. But high transport costs are constraining them from selling more forest products. There has been no change in access to common land for grazing animals or collecting forest products now compared to 5 years ago. With 5–6 days of continuous rains, Bical gets flooded. This has a serious impact upon the poor who lack the safety nets and security assets to recover quickly. As the very poor and poor are paid on a daily work basis, they do not earn during natural calamities. The severity of the situation depends on the duration of the natural calamities. To attend classes, high school children have to walk across the flooded river, change, and proceed to their school. Much less capital is 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 consider themselves as having the same quality of life as that of their neighbors, while the rest claim they are worse off (very poor, 23%) and better off (15%).

4. Negros Project Site

39. In Barangay Magallon Cadre, the poverty incidence is high. Villagers consider a high percentage of households as poor and very poor (60%), better off (35%), and rich (5%). The poor in the village are those households that have difficulty in meeting even their daily household food requirements. They are usually landless and work as unskilled labor in the plantation. The better off are skilled workers (drivers, mechanics, carpenters), tenant farmers, those in business, and fixed-income professionals. The rich are big landowners who own 80% of the agricultural land of the village, 65% of which is planted with sugarcane.⁹ As the local economy is dependent on sugarcane plantations, livelihood and employment opportunities in the village are very limited and seasonal. It is only in the peak season (October to February) that all workers in haciendas are employed. During the off-season, the poor have practically no other source of income than the haciendas.

40. Villagers’ primary occupation is agricultural wage laboring (48%) and farming (22%). There is not much alternative employment opportunities except for a few variety stores. The absence of microenterprises in the area is mainly due to villagers’ lack of capital and credit history, and collateral.

⁹ The socioeconomic classification in Magallon Cadre is slightly different because of the agro-industrialization in the area. There is a large wage labor-base providing services to absentee landowners in sugar production. The main socioeconomic difference identified by villagers is, therefore, between those who labor (and thus fall into the category of the poor and very poor); those who have some alternative source of income (the better off); and the landowning rich. Within the category of the poor are included those who, in other study areas, have been identified as the poor and very poor.

Several informal credit schemes are available (even prior to the road improvement) for villagers to start a microenterprise, but these are not easily available to the poor households in times of emergencies. There has been more participation in the credit schemes after the road rehabilitation. Most of the target clients are the poor rice farmers who have high repayment rates as they have the flexibility to pay in cash or in kind. Variety stores provide informal credit to the poor during hard times. Wage rates for hacienda workers in the village are very low (males from ₱70/day to ₱100/day and females ₱60/day). The poor do not seek jobs outside the hacienda because their exposure is only limited to work in haciendas. Unless they develop other skills, they cannot take advantage of the transport services to seek employment elsewhere. They usually have no savings at all to draw money to look for other opportunities. Because of a labor surplus in the village, poor households make themselves always available for work in the hacienda, otherwise they will be replaced.

41. Most poor households experience food scarcity, especially in August. This coincides with the milling season when there is 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 farm not more than 1 ha of land and most of them are tenants. Although sugarcane plantation dominates the landscape of Magallon Cadre, the majority of households rank paddy as their most important crop. These farming households seldom hire the services of the poor households in the village as they have enough family labor for their farm requirements. The majority of the households (68%) consider themselves as having the same quality of life as their neighbors; worse off 22%; and better off 10%.

5. Negros Control Site

42. The impoverishment of Barangay Macagahay is mostly due to inaccessibility to the area. Although the economy is diverse, its development is highly constrained by low agricultural productivity of staple crops such as corn and rice due to difficulty in transporting farm inputs such as seeds and fertilizers, and considerable difficulty in marketing agricultural products such as banana, bamboo poles, and farm animals. Villagers classify households in their area as very poor (20%), poor (70%), and better off (10%). The very poor households are landless, have no regular job or are even totally jobless, household heads with no formal education. The poor households have access to land where they plant mostly staple crops and are mainly self-employed. The better off are professionals who settled in the village due to their work assignment and those owning agricultural land.



Children carry water in Negros control site

43. Due to absence of access roads, villagers have considerable difficulty in traveling during the rainy season as it is slippery terrain with flash floods. Farm products perish when these are not transported during the rainy season. Farming (46%), followed by agricultural wage laboring (39%), is the primary occupation of most members of the households. Despite inaccessibility, agricultural buyers come to the area as they can buy livestock and other agricultural products at about 10–20% cheaper than in Moises Padilla town. Most households in the village are dependent on farming, rather than on the agricultural wage labor market. They farm less than 1 ha of land and are either owners or tenants. The majority of the households rank corn as the most important crop for them as it is their staple food. Banana is their next important crop followed by root crops such as camote and cassava. In particular, most of the very poor households survive day-to-day by just having root crops for breakfast and lunch. Most only have a full meal for dinner; steam-milled corn with dry fish or fish paste, or even salt.

44. Unlike Magallon Cadre, a relatively larger number of households (38%) collect forest products—mainly charcoal and bamboo—and sell these at the markets or to neighbors. Usually, the very poor and poor households collect forest products as it is time consuming. At the village, they sell charcoal at ₱25–₱30 per sack and bamboo poles at ₱20–₱25 per piece. To this price, they just add the porter charges of ₱10 per sack and per piece for buyers in Montilla. Most households in the village do not wish to sell more animals and forest products, particularly bamboo, as they have considerable difficulty in transporting the products to the market. The majority of the households (70%) consider themselves as having the same quality of life as that of their neighbors, while the rest feel worse off (22%) and better off (8%).

D. Transport Impacts and Linkages to Poverty

45. Beyond ensuring basic access, transport is a low priority for the very poor. Much of their travel is localized, for productive or subsistence purposes. In particular, they have 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 may have the potential to slowly graduate out of poverty, significant restraints exist. For small tenant farmers of copra, for example, conditions of tenancy include selling copra to the landowner at a predetermined price. The potential for making use of better transport links to explore wider markets is, therefore, irrelevant. The very poor and poor households use jeepneys rather than tricycles since they are cheaper. As a consequence, they spend more time in traveling and this prevents them from engaging in other activities where they could earn income.

46. After the rehabilitation of the study road, there is some outmigration evident from Barangay Palale to urban centers. There is also outmigration in 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 has substantially influenced the setting up of roadside businesses especially in Negros project site. Small vending stalls (particularly for fish) and variety stores along the road offer an opportunity as main and supplementary sources of income for the poor and a possibility for them to move from a poverty status to being better off.

47. Based on the overall perception of the villagers in the study areas, the positive impact of improvements to roads as ranked in order of importance are (i) availability of more transport, (ii) cheaper transport and better road surface, and (iii) increased opportunities to sell things. The negative impact to making improvements to the roads are ranked as (i) increased dust and noise pollution, and (ii) outside interests buying up land and resources. There was no significant movement away from poverty, although marginally, the project sites have less poverty than control sites in both the study areas even with the existence of good quality roads and transport services. Household income and consumption levels remain low and in some cases are not sufficient for their basic needs. This is 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 is 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 either by being involved in the road construction phase or its subsequent maintenance work.

48. Lack of access to land remains a critical determinant of poverty in both study areas. Households that are unable to access regular income from agricultural production usually belong 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 cultural practices adopted 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 are no innovations in primary production both in the coconut and sugar industries, as they remain vulnerable to market price fluctuations that put the locals at the mercy of external forces. Farming households in project sites have more direct access to markets and contact with agricultural buyers due to availability of better roads and transport services. They are no longer solely dependent on buyers coming into their area. On the other hand, there is no influx of other cash crops into the study areas nor are villagers practicing intercropping or multiple cropping for diversifying their activities and increasing their food options. It seems that the transfer of agricultural technology is lacking in both study areas. Livestock and poultry sectors are still backyard growers. As a consequence, villagers in both study areas suffer food deficits as the quantity that they produce is less than the quantity required by the households for food consumption.

49. The graduation from poor to nonpoor through migration may 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 enhance the delivery of various government services to the poor in the project areas. It also gives 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 in the project areas. The potential for using the roads to facilitate economic activity is evident in the project areas, but the poor are in need of financial assistance to start their own businesses like sari-sari stores along the road, which might enable them to get out from poverty.

CASE STUDY DETAILS IN SRI LANKA

A. Introduction

1. 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 North Western Province Water Resources Development Project (NWP-WRDP) and the Southern Provincial Roads Improvement Project (SPRIP).

1. North Western Province Water Resources Development Project

2. **Description of NWP-WRDP.** The main objective of the Project is 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 the employment opportunities for the unemployed and women. In order to meet these objectives, the Project is made up of the following components:

- (i) rehabilitation, improvement, and restoration of rural infrastructure including major, medium, and minor irrigation systems and rural roads;
- (ii) credit lines to promote development of farmer-owned irrigation systems (wells and lift pumps) and to rural women for establishing income-generating activities; and
- (iii) 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. Four hundred fifteen kilometers (km) of D and E class 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 link them to provincial highways. The work primarily entailed broadening carriageways, graveling the surface, and improving culverts and bridges.

3. **NWP-WRDP Setting.** The North Western Province (NWP) of Sri Lanka comprising districts of Kurunegala and Puttlam has a diverse ecology spanning three major zones: wet, intermediate, and dry. The primary crops vary from being 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 the 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 the Kotewehera Divisional Secretary's (DS) Division of the Kurunegala District. The road connecting the provincial capital of Kurunegala to Puttlam runs by the side of the Kotewehera DS Division. The study area is in the interior of the division.

2. Description of the Study Areas in Kurunegala

4. **Ambala-Inginimitiya Road, Kurunegala.** The road segment selected is a D class road, from Ambala Junction in Kotewehera to the Inginimitiya tank dam, a length of 16.5 km. It falls under the purview of the Wariyapola Divisional Engineering Office of North Western provincial council. The road was developed in three phases: the first 4 km was metalled and tarred in 1995,

¹ Asian Development Bank. 2002. *Impact Evaluation Study of Rural Roads on Poverty Reduction: Sri Lanka Country Report*. Manila.

4–8 km graveled in 1996, and 8–16.5 km going through the case study village was graveled in 1998.

5. The first 4 km are in a good condition. The presence of potholes was moderate along the gravel road over the 4–8 km stretch. But the condition deteriorated with many potholes thereafter, but overall, the road was in a usable condition. The culverts along the road and the bridge at 16 km are also in a good condition. The drains on either side are not continuous and are partly filled with loose gravel. This may cause the road to become inundated during heavy rains. The road is maintained by the North Western Provincial Engineering Department, which gets Rs12,000 per km per year for the maintenance of a gravel road.² The current method of maintenance is by direct labor. Maintenance of gravel roads are mainly in terms of motorgrading especially after heavy rains. This was done at the end of 2000.



Schoolchildren taking trip to town on a hand tractor on the Kurunegala study road

6. **Kurunegala Project Site.** The case study village of Nugannoruwa is a traditional village. The houses are clustered together, bordered by the Nugannoruwa tank and (wet) paddy fields on one side and the dry farmlands 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 four are female headed, are linked with very strong kinship ties perpetuated by the high level of intermarriage. Lower income households rely to a great degree on the support of relatively more economically stable households.

7. This area borders Sri Lanka's dry zone and had suffered from a severe drought for the past 3 years. The irrigation tanks surrounding the village are dry, and farmers who are unable to depend on paddy cultivation as a livelihood are relying now upon traditional forms of dryland agriculture, akin to shifting cultivation. Problem ranking with different groups of villagers showed that this crisis afflicts all members of the community, and not just the landowners, as poorer villagers too are tied into the paddy economy through daily waged labor. While richer landowning villagers have assets and savings upon which they can rely on in a crisis, the poor seldom have this support, and so fall quickly into a cycle of impoverishment from which it becomes increasingly difficult to escape.

8. Due to the prevailing water crisis, more and more food items have to be purchased and the debts to village shops increase. The shopkeepers generally give credit for small items till the end of the week, but full payment is made only rarely. The shopkeepers buy stocks on credit from vendors in the town with whom they have good relations. The high degree of social cohesion has also resulted in very active community organizations. The funeral aid society³ of Nugannoruwa has expanded to include activities such as managing the village preschool in the community hall built by it. It is also the controlling body for fishing in the Nugannoruwa tank.⁴

² A section of the road of length 5.6 km that goes through Ingimitiya dam is maintained by the Irrigation Department.

³ 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.

⁴ Fisherfolk are charged a 50% levy on their catch and the funds are used for tank maintenance.

9. **Kurunegala Control Site.**⁵ The control area studied was made up of two villages, Walahinikalla and Wembuwa, which are at least 45 minutes' walk from the bus route. Both are populated by families that have 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 social activities and the community organizations of Nugannoruwa. Villagers in Nugannoruwa own paddy lands in the Walahinikalla fields. These are the only fields that have been cultivated during the drought. It is the availability of water that has lured families to move to this more remote area. Of 11 households, two are occupied during the daytime by elderly widows who go back to Nugannoruwa to sleep, as access to health care in an emergency is difficult from Walahinikalla. Similar to the project site, the primary livelihood source is paddy farming supplemented by livestock rearing, which has increased substantially over the last few years (Appendix 6, para. 40). The land in the high ground enables pasturing, home gardening, and the cultivation of coconuts. The main preoccupation of the community is the lack of a road, an issue that came up frequently in communication with the study team.

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

3. Southern Provincial Roads Improvement Project

11. **Description of SPRIP.** The rationale of the Project is to improve rural accessibility and reduce road transport costs, as these are prerequisites to achieve economic growth and poverty reduction. The primary benefits of the Project are perceived in terms of reduced road transport costs as a result of improved accessibility and reduced maintenance costs. The main beneficiaries are expected to be the rural population and other low-income groups in Southern Province. It is currently ongoing, with implementation commencing in April 1998 and scheduled for completion by December 2003. The implementation is through the Southern Provincial Road Development Authority, which reports through the Southern Provincial Council to the Ministry of Provincial Councils and Local Government of the central Government.

12. The project objectives are to (i) rehabilitate about 550 km of the 1,800 km secondary road network in the 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 the above objectives, the Project includes three components: civil works for road and bridge rehabilitation, SPRDA capacity building, and consulting services for project implementation.

⁵ The identification of a sufficiently populated control site was a problem. Due to high road density, the accessibility criteria 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 to carry out a census rather than a sample survey. Even then, the number of usable household surveys completed in the control area was 29.

13. The SPRIP developed a system of prioritizing roads for selection.⁶ Each road under consideration is ranked based on key indicators of present road condition, economic development potential, and social needs. The economic development potential focuses on the number of villages and the land use patterns, commercial activities such as shops, industrial activities such as factories, and the availability of public transport and traffic levels. The 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.

14. **SPRIP Setting.** The Southern Province is made up of the three districts of Galle, Matara, and Hambantota. It displays a great diversity in ecology and correspondingly in the economy. Approximately 45% of the population is employed in the agricultural 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 the Southern Province does not compare well with national averages, particularly in terms of rural roads. The case study area was located in the Pasgoda DS Division in the Matara District. Here, of the existing roads, only about 50% can be used by all types of vehicles while over 15% cannot be used by any vehicles.⁷ This area's economy is based on smallholder tea, coconut, and cinnamon.

4. Description of the Study Areas in Matara

15. **Urubokka-Katuwana Road, Matara.** The selected road section considered for study in the Southern Province is a C class road from Urubokka to Katuwana, 10.5 km in length. The SPRDA of the Southern Provincial Council manages it. Makandura divisional engineer (under Matara district engineer) is allocated Rs10 million annually to maintain 171 km of paved roads and 40 km of gravel roads. Normally, roads are patched three times per year while those that are extremely poorly motorable gets patched as much as 12 times per year. The current method of maintenance is by direct labor, and this is expected to change to tendered contracts in the future. The study road is presently in good condition since construction was completed in 2001. The road surface is single bitumen surface treatment with 14 millimeter metal chips and is expected to be strengthened in the future 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 is concreted to avoid erosion. There are two span bridges at the 2 km and 5 km points.⁸ In 1988, the road was widened, graveled, and it was tarred in 1994. It deteriorated to a poor condition due to its narrowness and the lack of maintenance of the surface and was almost unusable for vehicles prior to the SPRIP rehabilitation.

⁶ Information based on communication with General Manager, SPRDA, and Southern Provincial Roads Improvement Project; Phase 1 Final Report.

⁷ Wijekoon Banda, T.M. 2001. *The Study of Rural Road Network in Southern Province*. Unpublished draft report. Intermediate Technology Development Group.

⁸ The bridge at 5 km is about 3 m and at an intersection with a sharp bend. It was observed that the 2-door bus heading from Katuwana had to back up four times to cross the bridge.

16. **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



Rocky path to Makiliyatenna is difficult and dangerous

Division is made up of seven loosely structured villages populated by 490 households, 6% of which are female headed.⁹ Villagers were not always clear as to which village they belonged to within the division. This fluidity in the concept of the village was in stark contrast to that of the project site in Kurunegala. The terrain over which the 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 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 society that operates at some level and has a village-wide membership is the clientele of the

temple. Community level organizations that are sponsored by the State do exist, but come into operation only when the state bureaucracy necessitates it. However, friendship and kinship ties are quite strong and are frequently relied upon in livelihood forms. Currently, the community is benefiting from a strong price for low altitude tea. Prices for farmers' produce are good, and laboring opportunities in the plantations are available.

17. **Matara Control Site.** The control area households were on the upper slopes of Makiliyatenna GN Division. While 310 households make up the eight villages of Makiliyatenna GN division, about half of them live on the upper slopes of the hills on either side of the Katuwana Road.¹⁰ 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 exists. In common with the project area, the control area also had no public institutions or common space 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 is very similar to that of the project area. The differences stemmed almost exclusively from the location in terms of 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 was articulated frequently at focus group meetings.¹¹ There is a strong feeling that the benefits of the improved Katuwana Road are passing them by. The track that leads up to the upper slopes is in very bad condition. Even if a group may hire a tractor to bring up some fertilizer, it gets stuck quarter mile up the track requiring the operators to push it. In such an instance, headloading is the other alternative. The villagers of the control site have to access the same institutions and services as those in the project site, and this has increased their sense of being marginalized.

B. Transport Situation

18. **Kurunegala Project Site.** The primary transport asset of the villagers of Nugannoruwa is the bicycle. All households have access to a bicycle: either their own or a neighbor's. This mode is

⁹ Data from Heegoda GN office.

¹⁰ Data from the Makiliyatenna GN office.

¹¹ During the rainy season, they carry fresh clothes to change into before getting into the bus because they have to slide on foot to get to the road.

used extensively by both men and women within the village and for short distances out of the village. Mobile traders on bicycles trade fish, milk, fruits, etc. Transporting of cargo (water, firewood, grain, etc.) on bicycles is primarily a male task though women transport children to school. The main mode of transport from village to the nearest town (Nikaweratiya) is by bus. The goods are charged at the rate of approximately Rs20 per (gunny) bag in the bus. Salaried employees and older schoolchildren use the bus daily to go to Nikaweratiya town. The majority of the younger children attend the local school and either walk or cycle to school. The morning bus on market day is overloaded. There is an increase of passengers using the bus and decrease in bicycles use indicating reduced local travel and increased external travel on market days.



Bicycles are used for collecting firewood and transporting grain in Nugannoruwa

19. The only regular public transportation available are the Regional Transport Company (RTC)



Government bus along study road in Kurunegala

buses. The bus fare from Nugannoruwa-Nikaweratiya is Rs10. The bus service is very regular and thus reliable. There are six Land Master hand tractors of 12.5 horsepower that are owned by the villages. Most of the tractors are used for ploughing their own lands and for their own daily uses like transporting water. Two tractors are used to plough for a fee. Tractors are also used for small freight transport jobs and passenger transport on an ad hoc basis. The charges levied range from Rs150 to Rs600. All of the tractor owners have contributed to the improvement of the road at some stage through *shramadana* programs by lending their vehicle for transporting earth, etc.¹²

20. Another villager owns the only truck in the village. The truck is used for transporting cow dung to Kalpitiya from the village. There is excess demand for more trucks for transporting cow dung. The same villager also owns the only van in the village, which is an air-conditioned 15-seater vehicle. The demand for this vehicle is less other than on auspicious or religious days. The driver is paid 20% commission from the hires. There is no 3-wheeler in the village. However, villagers access the 3-wheelers in the neighboring villages and those at the 3-wheeler park near the main road at Kotewehera. Most of the garment sector workers



Going to market at Urubokka, Matara

¹² Shramadana is a community activity for which each household contributes whatever possible such as labor, food, or equipment.

returning to the village for holidays use the 3-wheeler. It is also used to access health care and other emergency needs as well as to transport cargo.

21. **Kurunegala Control Site.** The transport infrastructure and services available to the control site community are the same as those available to the project site community. The crucial difference is, however, that they have to first access the road. At certain times of the year, it is 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 too own bicycles. As in the project area, both men and women use bicycles. Very often, bicycles are used to transport cargo even if it has to be wheeled a significant part of the way. Adults prefer to wheel young children to school as it is much faster and less tiring than walking with them. The greatest problems are faced in the case of emergencies. Transferring patients to hospital is the major constraint. Unless the patient can sit on a bicycle, the only option is to use a modified stretcher or a “sick chair.” Both of these entail significant hard labor to carry the chair over ill-defined tracks, especially at night.

22. **Matara Project Site.** The traffic on this road is much heavier than on the NWP-WRDP study road (Appendix 1, Table A1.1) because it provides a short route between two parallel road networks running from the coast to the interior of the Matara and Hambantota districts. The most popular personal vehicle in this area is the motorbike. The popularity of the motorbike over the peddle bicycle is a reflection of both the hilly topography of the area as well as the relatively higher income levels from cash cropping in Matara compared to Kurunegala sites. However, a majority are bikes which have very low engine power. There are only two buses (both privately owned) plying the section of the road past the study sites. The one-way fare is Rs20. Usually, the buses have a specified schedule. The operators informed that the passenger demand is high on Saturday (market day) and that buses do not operate on a time schedule but commence the journey as soon as the bus is loaded to capacity. On Saturday, an additional private van runs between Udagomadiya and Katuwana. According to the sources from RTC, a new bus plying between Katuwana and Urubokka was expected soon after the fieldwork period. The transport service is very clearly in a dynamic stage of expansion, with even long distance RTC buses going through. If more buses start using this road as a link route, the service available to the villagers will increase dramatically, provided that the buses stop along Katuwana Road.

23. Tea estate trucks are cargo vehicles which have been modified to carry village labor at the



Trucks to pick up women for work in large tea estates in Matara

tea companies' cost to large and medium-scale tea estates. There are two modified trucks and one bus, which operates to Kiriwanaganga Tea Estate, which is the largest in the area. A vehicle is paid Rs1,450 per day for the two trips in the morning and in the evening. The timing is adjusted to enable the transport of both day and night shift workers in the two directions. In addition, there are about 10 more modified trucks plying to estates in Morawaka, Deniyaya, and Waralla areas (all over 30 km away). These vehicles are also paid in the range of Rs1,500 per day. Two 3-wheelers are parked near the Nagaha Junction (close to the project site) and near the Udagomadiya Bridge (close to the control site). There are other 3-wheelers in households along the road that do not park at the hiring points but are available for hire. The 3-wheel hire charges for distances less than 3 km is between Rs30 to Rs50 per km. Each additional km is

charged from Rs10 to Rs20. For those from outside the village, they charge more compared to the villagers. The 3-wheel operators were of the opinion that their income was reduced after the completion of the road project. Three-wheelers are used essentially for nonroutine travel and for visiting the hospital and most frequently when children are taken to the hospital. Hand tractors and trucks are used to transport green leaf (unprocessed tea leaves) from the collection points to the factories. Cultivators headload the tea to the collection points on the road.

24. **Matara Control Site.** As in the case of the Kurunegala control site, the households in the control area rely on the same transport infrastructure and services as those in the project site. The critical difference arises from the much harder terrain faced by the control area prior to accessing the motorable road. A few households have invested in motorbikes, primarily as an income-generating asset. Most use it 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 hospital is far worse than in the control area in Kurunegala. While the same methods of stretchers and “sick chairs” are used here too, the hilly and slippery terrain make it a far more difficult and dangerous task. Very often, there is no option but for a sick person to walk unaided at least up to the track that leads up from the road.

C. Poverty Situation

25. The poverty situation in Sri Lanka presents an unconventional duality as the level of human development is far higher than can be expected on the basis of its gross domestic product (GDP). The GDP per capita of \$820 ranks Sri Lanka as a lower income nation and 137th in the world. However, in terms of human development, Sri Lanka ranks 81st in the world with a human development index of 0.735.¹³ However, consumption poverty still remains a major issue as approximately one third of the population fail to achieve an acceptable quality of life. The incidence of poverty at the lower poverty line of Rs791 per person per month at 1995/96 prices is 25.2%. At the higher poverty line of Rs950, the incidence moves up to 39%.¹⁴

1. Kurunegala Project Site

26. Discussions on the levels of economic stability and poverty in the village were strongly colored by the present 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 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 the crisis situation. The worst affected were identified as 30% (very poor) of the households that were totally dependent on agricultural wage labor. The rest (50%) of the



Participatory rural assessment activities in Kurunegala project site

¹³ United Nations Development Programme. *Human Development Report 2001*.

¹⁴ An official poverty line does not exist for Sri Lanka. The accepted working levels are those calculated by researchers based on the data of the Central Bank of Sri Lanka or the Department of Census and Statistics.

households (poor) were in between. In the survey, the self-perception of comparative quality of life was quite similar with 28% perceiving themselves as “better than others,” while 20% thought themselves “worse than others,” leaving 42% “about the same as others.”

27. **Landholdings.** This problem of lack of water—rainfed or irrigated—has been gradually aggravating over the last few years and has now begun to take on crisis proportions. Its impact is felt by the entire village irrespective of their income status. The only fields that are cultivated for at least one season are those that are fed by the Walahinikalla tank, which is adjacent to the control site. The project site tank is conserved for consumption. Access to land is fairly equitable with only about 10% of the households being landless and most family groups (but not all household units) have some land in the Walahinikalla fields as well as the Nugannoruwa fields. The size of landholdings varies dramatically: about three family groups hold a majority of land. The situation could have been rather different if farmers with larger holdings 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 have prevented this from arising.

28. **Changing Livelihood Patterns.** Despite the current attempts to distribute water equitably, being deprived of the primary source of income and livelihood has had different impacts on households. Those households with a large landholding, which previously had a strong income flow, have been able to build on their assets to cope with the changing situation. The case study of Mr. Lalith (Appendix 8, Box 16) shows that the movement into transport and trade-related enterprises is an example of taking advantage of family savings and wealth to diversify successfully when cultivation deteriorated. These households also have 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 have enabled family members to stay in education longer, is now paying off as almost all these households have employed graduates or teachers. One of the more positive aspects of the conditions at Nugannoruwa is education. The level of education in the village is very high. The majority of those under 40 years have received 8–10 years of education. Over the last 10 years, seven students have graduated from Sri Jayawardena Pura University Colombo, either as internal or external students.¹⁵ The interest in education is increasing as the need to look for external employment increases.

29. Households with a smaller landholding are also turning to other sources of income. Increased dependence on livestock is a trend that is clearly visible. Cattle and buffalos are reared primarily for milk and dung. Due to the existence of a system of leasing animals, households with few assets can move into dairy farming. The milk is sold either to individual traders who collect door to door or at the milk cooperative situated in the adjoining village (Appendix 8, Box 10). Trading in fish, and free-growing seasonal fruits such as tamarind, lime, and mango is yet another source of income for lower income households. The most vulnerable are those households that have always relied on wage labor. The asset base of these households is very low and is frequently limited to a bicycle and basic farming tools. The reduced opportunities 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, has created a situation where over 60% of the families in the household survey acknowledged the scarcity of food. This is 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.

¹⁵ Source: Probation and Childcare Officer.

2. Kurunegala Control Site

30. Since most families in the two control sites of Walahinikalla and Wembuwa had moved there to seek better livelihood opportunities, they are generally poor. The self-perceptions of the households in the two control sites are worse than others (43%), better than others (7%), and about the same (50%). While the possibility of accessing external sources of income is much lower here than in the project site, the potential for subsistence home gardening is greater. There is little difference in the conditions faced in paddy cultivation as the fields around Walahinikalla are farmed by households in the project site as well. Most families in Walahinikalla own very small plots of land. As such, food insecurity is 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, employment opportunities, and 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 is not only a matter of life and death but it is also one of human dignity.¹⁶ Despite the difficulty of access, most families encourage children's education, and the average levels differ little from those in the project site. However, there are no undergraduates or graduates in the control site.

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

3. Matara Project Site

32. The size of landholdings is a crucial factor in sustaining poverty. In the Heegoda GN Division, to which the project area belongs, 36% of the households own 16% of the land of less than 1 acre each. Twelve percent of the land, plots of between 2 and 5 acres each, is held by 10 households. The majority of the households (54%) hold between 1 and 2 acres of land and make up 40% of the total land area.¹⁷ The group with less than 1 acre of land cannot generate sufficient income from cash cropping and depends heavily on wage labor. The intermediate group can meet their basic needs but also engage in supplementary activities of wage labor, skilled labor,

¹⁶ A patient who died from a snake bite, after a week in hospital, could not be brought home for burial due to floods.

¹⁷ Data from Heegoda GN Office.

or microenterprise 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 2 acres would need only 1 day of labor per week. Although the level of land ownership is not highly concentrated, because landholdings are small and the poor are required to work in the tea plantation throughout the year to keep their jobs, this limits 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 to 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 work only on their own land and/or have state sector employment as economically stable and better off. To this group were added those who have other sources of income based on enterprise. It is also this group that benefits 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—have been established by this group.

33. The levels suggested by the focus groups and the self-perceptions of the households correspond fairly closely. According to the self-perception, 15% were better than others, 42.5% were about the same, and 42.5% were worse than others. The groups that consider themselves “about the same” and “worse than others” roughly equal the 80% suggested by the focus group as being poor. In terms of education, just 1% had a tertiary education.¹⁸ 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 are frequently left unattended for the entire day. There are 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.

4. Matara Control Site

34. Similar to the project area, the control area focus group identified the ownership of sufficient tea lands as a critical factor in the households being nonpoor. A smallholding of 2–3 acres 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 lies in the fact that in the control area, wage labor is often away from home from very early hours in the morning till late evening due to the time taken to walk down to the pick-up 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-perception in the household survey reflected 10% as better than others, 55% about the same, and 35% worse than others. Education in the control area is even more unfavorable than that of the project area. They have to deal with issues of child supervision as well as access. Their children attend Makiliyatenna Primary School (a lower standard than Urubokka school) as Urubokka is too far to walk. Only secondary school children access the Urubokka Central College, but it is difficult to qualify to enter the school. Families who want to ensure a complete education for their children take the option of boarding their children at a relative's or friend's house in Urubokka or other areas. The villagers in the control area use the same health facilities as those in the control area. For a patient to walk or

¹⁸ Data provided by the Heegoda GN office based on those collected for the 2001 National Census.

be carried down this route is extremely hazardous. From the road, they can hire a 3-wheeler or use the bus. Since the rehabilitation, the number of 3-wheelers by the road has increased and the cost has decreased.

D. Transport Impacts and Linkages to Poverty

35. This section looks at how the road and transport system interact with poverty in different micro socioeconomies 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.

1. The Road as an Enabling Factor in Income Generation

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

37. Despite the water crisis, paddy remains 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, has made the harvest very poor for the last 3 years. The sale of paddy has fallen to negligible levels because the households maintain stocks of paddy to ensure food security as well as a form of saving. Hence, few traders come to the village to purchase rice. Transport is important in bringing the harvest home from the fields and taking it to the mill to be ground. While the modes of transport differ for each activity, the project road plays little part in the moving of produce, as most travel involved is internal to the village. The dry, hardened paddy fields where the bunds have been opened enables hand tractors to drive right up to the threshing site. Once the paddy is stored near the homes of the farmers, small quantities are taken to the village mill on bicycle as the need arises. In stark contrast to tea cultivation, headloading is seen very rarely.

38. For all tea smallholders, irrespective of their socioeconomic group, the benefits of the road are both in monetary and/or nonmonetary forms. Given the demand for green-leaf tea, the improved road has brought better prices, greater reliability in regular collection, and delivery of fertilizer to the starting point of the track. The collectors can no longer justify a high and fluctuating transport cost deduction from the factory price, and increasing competition among collectors has brought a better price. All collection points are on the project road. While the plots are on the higher slopes, the crop has to be headloaded in both the project and control areas. In most households, family members headload the crop to the road side. For the economically less secure group, the benefits have been primarily nonmonetary. The price paid for daily labor has not increased significantly. However, access to larger estates have become less difficult as the estates now provide free transport to all registered labor. Twelve converted trucks pick up labor from appointed points along the road in the morning and drop them back in the late evening. There is more free time now for other livelihood or leisure activities. Even control site households now have 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.

39. The occupational forms are very closely tied with the road. All salaried employees outside the village rely on the public transport system. Migrant wage labor predominantly uses the bicycle

or the bus. Other sources of income generation are being developed by the villagers as a direct reaction to the problems faced in farming.

2. The Road as a Safety Net

40. In Kurunegala, the water crisis has hit hardest the households with no diversified income base and low levels of assets. While those with diversified income sources are rapidly expanding them, others are entering into new sources of income based on existing asset, knowledge, or



Cow dung collected in
Nugannoruwa

network base. In most cases, the households have had to look beyond the confines of the village or fields and thus have come into direct contact with issues relating to transport and the road. Mr. Lalith's household (Appendix 8, Box 16) is a good example of diversified income sources with a strong asset base, which has expanded directly into transport-related economic activities. Even households with a much lower asset base are increasingly turning to mobile trading as a coping mechanism as farming becomes unsustainable. As the majority of the households own a bicycle, this is frequently the asset base they work with. Networks open to the household are frequently a critical decision variable in what exactly is traded, e.g., fish or fruits such as mango, tamarind, and lime. Moving up the asset base, those with access to credit have purchased motorcycles to carry out trading activities. The rehabilitated road enables all-weather timely access for a fish-laden bicycle, ensuring the success of the activity. As can be expected, the condition of the road has a direct bearing on the ability and motivation of households to rely on these coping mechanisms. The ease of travel and safety (in terms of wastage of cargo due to bicycles or motorcycles sliding off the road) have been facilitated since the road improvement. The road also offers livelihood options to households with no private transport assets. Another livelihood

that has developed is the production of milk for a cooperative that was established in the next village. The cooperative relies on the truck arriving every day to collect the milk to transport for onward distribution. Before the road was rehabilitated, the road surface was poor, the truck was slow, and the road was often impassable during the rains and, therefore, not reliable. Now, villagers know that the truck will come every day, and this certainty has given them the security to invest their time and resources in developing their cattle holdings. In addition to milk, cow dung has become an important source of supplementary income. Trucks collect cow dung directly from the stalls. For poor families where paddy farming barely provides sufficient rice even for subsistence, quite apart from being an income-generating source, these new sources of income have become critical for survival.

41. The complete immersion of the SPRIP study site in the cash economy has meant that a greater number of households are seeing the increased connectivity resulting from the improved road as providing income-generating opportunities. The number of small retail shops along the Katuwana Road has increased rapidly. More tea collection points have opened since 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 have been taken advantage primarily by those who live by the road (retail shops) and/or have an asset base or network to build upon. The perception that most benefits from the improved road accrue to traders is very prevalent within the community. However, households which seem asset poor are also taking advantage of the situation. The region's natural ability to host a variety of wet-zone tree food

crops, spices, and fruits has enabled even the poorest households to earn a small additional income by selling these free-growing items to traders who now frequent the Katuwana Road.

3. Road and Transport as a Contributory Factor to Quality of Life

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

43. Economically secure households are able to buy provisions in the weekly market at a competitive price, while the lower income groups rely on purchasing small quantities. The increase in the shops in the village has meant that there is better access to retail goods to meet immediate requirements. However, the prices have not come down. The condition of the house is one of the primary indicators of someone's economic status. The inability to improve the housing conditions without considerable expenses 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 means a costly exercise in hiring headloaders or tractors. The alternative is for the family to headload building material whenever time permits, which is 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 to the control sites was more due to the problems of transporting building material than of different income levels.

44. 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.

4. A Core Issue: Access to Health Care

45. Better access to health care, especially in emergency situations, was an important factor that was mentioned as a primary contribution of the road by all groups of villagers and substantiated by the findings of the household survey. In Matara site, increased use of 3-wheelers to take patients to 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 is accessible at all times of the day and night, which enables quicker and safer transfer to hospital than the alternatives of using a hand tractor or 3-wheeler. The same applies to the increasing availability of 3-wheeler taxis in 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 is very high.

5. Penetration of State Mobile Services into the Village

46. 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 and services of health and agriculture extension officers services such as electricity, telephones, etc., 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 make the effort to service areas that are 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 a higher quality of service, it does mean the entry into the mainstream as in the case of civil security. While all groups within the village benefit from greater penetration by service providers, it is the low-income groups that benefit the most. As seen constantly in the study locations, the poor seldom travel outside the immediate environment other than for income generation. Such households would avoid accessing services provided elsewhere unless in extreme situations of need.

6. Social Capital, Empowerment, and Felt Need for a Road

47. Of the two study areas, the level of social cohesion, kinship networks of support, and self-mobilization of the community were much higher in Kurunegala sites than Matara sites. Despite this community involvement and initiative in ensuring the rehabilitation of the road, the villagers of Matara sites showed more initiative and capacity to mobilize public opinion than their counterparts in Kurunegala who come 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 leadership of the village (Buddhist monk) and lobbied for rehabilitation (Appendix 8, Box 15). 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 deteriorates, it is 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.

48. 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 a total of six households (out 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.

7. Negative Impacts of Road Improvements

49. 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 increase in dust and noise

pollution, increase in 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 was echoed in Matara, especially as a concern for children's safety when walking to school.

CASE STUDY DETAILS IN INDONESIA

A. Introduction

1. The study was conducted in two provinces in Indonesia: Bengkulu Province in the island of Sumatra, and Yogyakarta Special Region in Java island. The first case study focused on the Tree Crop Smallholder Sector Project (TCSSP)¹ at Bengkulu Province, while the other case study focused on the Third Local Roads Project (TLRP).²

1. Tree Crop Smallholder Sector Project

2. **Description of TCSSP.** The TCSSP project funded by the Asian Development Bank (ADB) (\$135 million)³ was implemented 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 other tea crops through variation 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 nonoil export earnings. It also anticipated a positive environmental impact by limiting 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 the improvement of living conditions in the rural areas.

3. The project scope was to establish and maintain the following: (i) about 75,000 hectares (ha) of rubber plantations,⁴ and (ii) about 20,000 ha of tea plantations. It also included pilot projects to (i) establish 10 small rubber tree nurseries; (ii) establish about 2,000 ha of drought-resistant tree crops; and (iii) 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 (i) plantation establishment and maintenance; (ii) construction of roads and buildings; and (iii) 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 (see photo).⁵ 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 report to a provincial office which, in turn, reports to the project director in Jakarta.



Farm roads leading to rubber plantations intercropped with paddy

¹ Loan 1118-INO: *Tree Crop Smallholder Sector Project*, for \$135 million, approved on 14 November 1991.

² Loan 1232-INO: *Third Local Roads Project*, for \$200 million, approved on 25 May 1993.

³ Actual loan usage was \$113.7 million.

⁴ Actually, 81,000 ha were developed.

⁵ This is a photograph taken at the early stages of the project.

4. **TCSSP Setting.** South Bengkulu District has a total area of about 6,000 square kilometers (km²) with a population of about 370,000. The TCSSP in the Bengkulu Province has two project units in North and South Bengkulu with six project subunits under each. The provincial government of Indonesia advised the study team that South Bengkulu District, Talo Subdistrict, 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.

2. Description of the Study Areas in Bengkulu

5. **Bengkulu Study Road.** The Project did not build rural roads in this area. Instead, the Project constructed farm roads in 1993 in this area, which connected the settlement area to the farms. Talang Padang-Tanah Abang Road, 16 kilometers in length that leads from the farm roads to the main road, was asphalted by the District Public Works Services in 1996. The villagers claimed 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's capital) where there is a state road that connects to Bengkulu (capital of the province). The people of Talang Kabu Village use public transportation on the road to go to the weekly market at adjoining Penago Village or to go to Bengkulu, the capital of Bengkulu Province to sell their produce.

6. **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 has 10,000 ha and a population of 470 families or 2,024 people. About 85% of families own land in the village, but 71% consider their occupation to be agricultural laborers because of limited land ownership (<1 ha). Other sources of income include laboring as construction, fishing, and basket weaving. The families who do not own land (15%) work as laborers and also work on basket weaving, fishing, home industry, firewood gathering, etc. Most landowners have noncertificate status of land ownership. Through 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 is very low. Food crops include paddy, corn, cassava, sweet potatoes, groundnut, and soybean. Tree crops include rubber, coffee, coconut, jackfruit, and durian. Most farmers have rubber and/or coffee in their smallholdings. The prices of these are highly affected by the fluctuations in world market prices. They are reluctant and unable to invest in inputs as a result. The farmers attribute their vulnerability and uncertainty to the fluctuating prices. It makes them less likely to risk increasing production if they expect that prices will fall. Then, they are more likely to concentrate on subsistence food production.

7. **Bengkulu Control Site.**⁶ 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 are unfamiliar with the terrace farming system or any sloping agricultural land technology. The population is 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%) have about 0.3 ha, thus their economic condition is not so different from those families who do not own land (5%). Their main source of income is farm labor. Their secondary source of income includes fishing in the river, basket weaving, and gathering firewood. Those who cultivate less than 1 ha also worked as farm laborers for additional income, therefore, it is difficult to differentiate the farmer from the laborer in

⁶ See Appendix 4 for access conditions.

the village. An exception, however, are the better-off villagers who own more than 1 ha. Sixty percent of farms produce paddy, 30% produce tree crops (rubber, coffee, durian, jackfruit, etc.), and 10% produce cassava, groundnut, corn, and many kinds of vegetables. The village experiences food scarcity from August to January, while extreme food scarcity exists during November and December before harvest.

3. Third Local Roads Project

8. **Description of TLRP.** Indonesia's public roads are classified as national, provincial, and district roads. TLRP aimed at helping the Government to improve the condition of district roads. This was based on feasibility studies financed by ADB in 1992 under Loan 863-INO and technical assistance (TA) 921-INO. The implementation of the Project was funded by ADB under Loan 1232-INO (footnote 2). Loan effectiveness was October 1993, and it was closed in May 2000. The Project covered the four populous provinces of Bali, Central Java, East Java, and Yogyakarta. The primary objectives of the Project were to improve the condition of the district road network in the four project provinces by providing financing for rehabilitation and improvement of roads in bad condition, support periodic maintenance, and strengthen the capabilities of the Public Works Office. Its principal development objective was economic growth. Project components to fulfill these objectives were (i) the rehabilitation or improvement of about 5,000 km of paved and unpaved roads and replacement of about 880 m of bridges, and (ii) 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 two districts in Yogyakarta, namely Sleman and Gunung Kidul.

9. **TLRP Setting.** The study area of TLRP in Yogyakarta Province is located in the Gunung Kidul District, Candirejo Village, and Panggul Subvillage. The control community is the Tepus Subdistrict, Sumber Wungu Village, and the Kelayu Subvillage. The Gunung Kidul District has a population of about 700,000 and has 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, sloped, and rocky. Maximum rainfall is experienced in February with an average rainfall of 551 mm per day. Paddy can be cultivated in about 5% of the land; 45% of the land is 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 is a main problem for agriculture, and land cultivation is dependent only on rain. The dryland paddy is planted in the rainy season.

4. Description of the Study Areas in Yogyakarta

10. **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 road rehabilitation project only covered 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 use the road for transporting their goods to the market at least twice a week. Villagers also use the road to go to various towns and capitals for other business activities. The district road is well maintained by the District Public Road Unit. The community also helps in its routine maintenance by cutting grass and cleaning the side ditch and road shoulder periodically with volunteers.

11. **Yogyakarta Project Site.** The 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 is used for dryland cultivation, and there are no wetland rice fields at all. Only 30% have certificate status of land ownership. About 63% of the villagers have less than 0.5 ha of land, while only 15% have more than 1 ha. The village has a labor force of 5,735 people, of whom 26% are unemployed. Eighty-seven percent of families get their main income from agriculture, while the rest are intermediaries and government officials involved in home industry, labor, etc. Generally, farmers have a secondary source of income like laboring in farms, industries, or construction work. Most farmers who have more than 2 ha of land usually have other occupations such as businesses, intermediaries, or are involved in transportation services. Others are government officials, health service personnel, teachers, etc. Due to unfavorable land conditions (dry, unfertile soil), crop production in the area is very limited. 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. Consequently, much of the cultivation is limited to cassava, groundnuts, and some banana. Some rice is cultivated for consumption, but diversification due to road improvement into higher-value cash crops would be difficult in these production conditions.

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

B. Transport Situation

13. **Institutional Arrangements.** The roads are governed by the Public Works Department, while transport services are the responsibility of the Communication Department. This includes the local government (province, district, and city). The transport network is divided into the main, branch, and local roads. The local primary roads are under the local government. The financing of roads is dependent on the status and function of the roads. Therefore, local primary roads receive different development actions compared with 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.



Community in Yogyakarta control site maintaining intra-village road

14. The commonly used vehicle in Bengkulu project site is the motorcycle for short distances (Appendix 1, Table A1.1). Other vehicles include vans and minibuses for long distances and nonmotorized vehicles such as bicycles. Many people, however, still prefer walking short distances and ride the bus for long distances. The dominant mode of transport is the motorcycle in Yogyakarta project site as well. In addition, vans, minibuses, and buses are used. Few bicycles are used. In contrast in Sumber Wungu control area, motorized vehicles are very rare in the village. The villagers do their daily activities mostly by walking. The local road

within the village is well maintained by the community. It was made of gravel using the Telford construction method, by the local people themselves. The village people constructed it using the self-help method without government support. Unfortunately, the community does not have the ability to upgrade the gravel road to asphalt and have requested funding support from the authorities.

C. Poverty Situation

1. Bengkulu Study Areas

15. The villagers' focus group discussion in Talang Kabu concluded that around 75% of the villagers are poor and that the poor lacked the following: source of income, food, education, information, and housing (Appendix 3, Table A3.2).⁷ Through focus group discussions, the following causes of poverty in the area were identified.

- (i) Job opportunities for farm laborers are not available all year but only during the planting and harvest season. Lack of skill and experience makes farm laborers less competitive inside and outside the village. Unskilled village youth often cannot compete with other more skilled and educated workers, even if they migrate.
- (ii) The access of rural farmers to current or advanced information on farm technology is very limited. The activities of two existing (TCSSP) farmer groups are mainly focused on selling their product and not on accessing information technology. Crop pests and diseases are also a major problem in these farms.
- (iii) Of the many reasons for low crop production, lack of land to cultivate is critical. The lack of funds for farm inputs also contributes to low crop production.
- (iv) The lack of market information access is also a problem. Farmers' groups need to link up with other farming groups outside the village to establish a network and have first-hand information on market prices to have a better bargaining position.



A men's focus group discussion in Talang Kabu



A women's discussion group in Talang Kabu

16. The sources of income of villagers, poor families, and nonpoor families are summarized in the table below:

⁷ See Indonesia country report for more details. ADB. 2002. *Impact Evaluation Study of Rural Roads on Poverty Reduction: (ADB TA 5979-REG)*. Manila.

Source of Income of Poor and Nonpoor Families at Talang Kabu Village

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

Source: Participatory rural assessment activities in Bengkulu, Indonesia.

A very poor family has an average monthly income of Rp55,000–Rp67,000. The head of the family usually works as a farm laborer for 8–11 days a month. The rest of the income is acquired from other odd jobs or borrowing money from a neighbor or intermediary just to put rice on the table. The average family spends around Rp85,000 per month for very basic needs. Both the very poor and poor families face food insecurity. Their income is often insufficient so that the family's basic food requirement is not met. Many times, these families only eat cassava, banana, and/or corn for breakfast and dinner. At times, the family does not get a chance to eat rice for 2–5 days. The poor families, however, claim that they are used to these conditions.

17. In Bengkulu, intermediaries (*tokeh*) and traders effectively control market exchange in paddy and rubber with debt relationships. It is increasingly difficult for the poor to escape from these debt relationships as indebtedness increases year on year. Numerous projects to help the poor have been implemented in the village before. However, the villagers were not 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 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 per month. Since 1999, the Government, through the social safety net program (SSNP), has been supplying and selling cheaper rice to the poor and poorest families.



Poor laborer headloading paddy from farm to village settlement

18. 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 are able to attend secondary school, and more than 75% stop studying after elementary school. Financial constraints usually hinder 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.

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

2. Yogyakarta Study Areas

20. The study community at Candirejo Village found that the community can 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: (i) farmland ownership, (ii) cattle, (iii) house condition, (iv) appliances, and (v) transportation (Appendix 3, Table A3.2). Villagers who own less than 0.5 ha of farmland were categorized as poor. The small piece of land is not enough to produce a high income for the family. However, according to the discussion on problem analysis, the size of land is not the main cause of poverty. The discussion on problem analysis identified five main causes of poverty:

- (i) Low quality of produce/commodity due to farmers' lack of skill in cultivation, pest control, and postharvest handling.
- (ii) Lack of access to market information and competitive power with other markets.
- (iii) Lack of roads and mode of transportation prevents farmers from having access to markets, and thus are taken advantage of by intermediaries.
- (iv) Farmers cannot plant high-value crops.
- (v) Sources of income are limited. The absence of irrigation systems further limit farmers from planting other viable food crops.

21. Despite their collective efforts, the poor families' generated income is still insufficient to sustain their needs. The very poor families (often with women acting as head) only have a monthly income of Rp40,000–Rp60,000. For example, a mother works for 4–6 times a week (half day), and her daughter contributes Rp30,000 every 2 months working as a domestic help. They borrow about Rp20,000–Rp40,000 from neighbors and pay back this debt by working as labor at the lender's farm. The family spends around Rp85,000 a month to buy rice, vegetables, water, soap, and gasoline for a lamp. Poor farmers who own less than 0.5 ha of land have an income of Rp45,000–Rp120,000 per month. This income comes from cassava, corn, and groundnut production from their own farms and working as a farm laborer for other farmers. Generally, they borrow around Rp10,000–Rp50,000 from intermediaries and other farmers around the village. To pay their debt, they have to sell their crops to the intermediaries at a much lower price than usual or they repay other farmers by paying cash or working as laborers. The family's expense for basic needs is about Rp150,000 per month to buy rice, vegetables, side dish (viand), water, soap, and gasoline for a lamp.

22. The poor and very poor families face food insecurity. A very poor family uses 50–70% of their monthly income to sustain their basic needs. They only eat rice during lunch and eat cassava, bananas, and corn for breakfast and dinner. Sometimes, these families even go for 4 days a month without eating rice. The condition of the poor is not so different from that of the poor family. The poor family uses at least 30–80% of its monthly income on basic needs. Generally, the poor family

chooses to borrow money from intermediaries and pays 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 seems to be the only way in which these poor families survive. They tend to borrow money to sustain their daily needs and are not able to invest in other income-generating activities.

23. Most of the poor and poorest families only attended elementary school, some do not even



A woman from a very poor family collecting firewood

complete that. Since they lack skills and education, the poor and very poor families are 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 (such as KUD), and other sources of capital are located in the capital subdistrict, which is about 7 km from the village. Further, these institutions require 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 is running well). These requirements are unfamiliar to the poor and very poor, and they have to

rely on the moneylender instead for their financial needs.

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

25. The household conditions of the poor are very similar to those of the project site. The poorly constructed houses result in these family members becoming ill often. Generally, instead of going to the village health center, these families rely on indigenous medical practitioners or faith healers to receive medical treatment because they cannot afford the medical services provided by the village health center. Only a handful of children from poor and very poor families are 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 in each other's farm in rotation and worked well during peak periods. Very poor laborers were paid cash for their work. In emergencies, the very poor ask for the payment even before they start a job.

26. The control community in the Kelayu subvillage of Sumber Wungu Village classified 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 family classes: (i) the type of lantern used; (ii) house condition; (iii) land ownership; (iv) cattle ownership; and (v) ownership of transportation, radio, television, and other facilities (Appendix 3, Table A3.2).

27. The subvillage is a remote area. In this large subvillage, there are only three small shops with limited capital (Rp200,000–Rp450,000). Most farmers cultivate their crops with minimal inputs, while a few rich farmers have cattle and inputs. The agricultural extension services rarely come to the village because of unavailable transportation. Only one truck comes to this subvillage once a week during market day because the operators choose to go to other villages with better roads. The transportation problem directly influences the marketing of agricultural production. More importantly, this also greatly affects the price of crops and the bargaining position of farmers who sell their crops. Only a handful of intermediaries from outside the village come to collect agricultural products, thus there is not much competition. All of the intermediaries are outsiders and the price of commodities is dictated by the intermediaries.

28. Three priority problems were found common between men's and women's discussion groups: (i) limited water supply, (ii) bad road conditions, and (iii) no electricity. There are no sources of water in the area. Each family has a water tank under the roof of their houses to collect the rain, which they save as drinking water to prepare for the dry season. This drinking water is sufficient for 1 month after the end of the rainy season, after which they need to buy water from outside the village. Three mobile tanks from the local district government supply the water every 2 days. Villagers usually buy the water in groups.

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

D. Impact of Rural Roads and Transport

1. Distribution of Benefits from the Road

30. 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. There are a number of reasons for this. First, it was those with some form of capital to invest initially, even if at fairly modest levels, that were able to take advantage of the opportunities that improved access to outside markets and networks provided. The case studies of Mr. Supardi and Mrs. Peti (Appendix 8, Boxes 14 and 17) show 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 (Appendix 8, Box 3).

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

32. Third, the better off in the community have the ability to access transport services and are 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.

33. The very poor in both Bengkulu and Yogyakarta are unlikely to regularly sell surplus agricultural produce unless illness or some household crisis requires it. In these cases, food security for the household is seriously compromised as a consequence. The very poor are often engaged in both study areas in selling firewood, grasses, and other forest products, which they can gather their incomes. The better access provided by the rehabilitated road (Yogyakarta) and construction of the road (Bengkulu) has opened up better opportunities for selling these products on a more regular basis. More buyers and intermediaries are now visiting the communities, and this enables villagers to sell at a higher price.

34. The basic farm access roads provided under TCSSP in Bengkulu are quite different from the asphalt road in Yogyakarta provided under the TLRP. These basic TCSSP roads seem to serve an important function for the poor, which demonstrates how reliant they are upon intra-village travel over external travel. The roads are used primarily to access farmland, and they are inaccessible to all but the most determined motorized vehicles. For poor villagers who have traditionally been employed in portering crops from the fields to the roadhead, the better farm roads have 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 work. Now, they can use handcarts to transport the crops, carry more with less effort, and make more trips. They now also have more time and energy to do other things (Appendix 8, Box 5). However, the improved access and better opportunities for income earning through this activity has led to an increase in competition among laborers for this kind of work. They can now use handcarts to transport goods along these access roads to the main roadhead. This means that there are 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 (Appendix 8, Box 18).

2. Provision of Transport Services

35. The availability and frequency of transport services in both the Bengkulu and Yogyakarta study areas have increased. In Yogyakarta, there has also been a significant reduction in transport prices for passengers, though this is less clear on the asphalt road in Bengkulu. One reason for this may be the proximity of the Yogyakarta project site to the main town of Yogyakarta proper; at the Bengkulu study site distances to major trading centers are much greater, and the potential for competition among operators is, therefore, reduced. The Yogyakarta study road is also more closely connected to the main network in the area. Nevertheless, improved services have resulted

in both areas as a result of the road improvements. For vehicle operators in Yogyakarta, they have lost their monopoly position through the wider availability of services, but have been more than compensated. They can no longer run a completely full vehicle, but make more trips per day as a result of the better road, and their vehicle operating costs are significantly reduced because of the better road surface.

36. Evidence from the control area in Yogyakarta appears to confirm that transport providers gravitate 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 is better as the road is better; the risk to their vehicles is much higher on the bad roads. As a result, more inaccessible areas are left with an infrequent service usually run on a monopoly basis. Operators can charge what they like as they face no competition. In the case of intermediaries buying agricultural produce, this also means that they can largely dictate the prices at which they buy, as farmers have no option of selling in a wider market outside the community.

3. Access to Services for the Poor

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

38. The improved asphalt road to the study area in Bengkulu and the rehabilitated road in Yogyakarta ensure 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 have shortened their travel times and improved their attendance. District officials also report that it is easier to monitor the provision of services in the field with better roads. The case study of Mr. Sumianto (Appendix 8, Box 22) the extension worker in Yogyakarta, shows how he is now able to meet 90% of his work targets, against only the 40% that he was able to complete before the road improvements. Mrs. Suryatini, the local nurse, also reports a qualitative shift in the level of service that she is able to provide to the community because of the better road (Appendix 8, Box 21). Officials report higher motivation to do their jobs and some have been able to take up secondary occupations to supplement their incomes because of the time saving through better transport.

4. Long-Term Sustainability and Community Involvement in Roads

39. 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 as rubber trees grew and rice could no longer be intercropped between them. The road has 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 are, therefore, now slim.

40. In both control areas for the study, though, it is clear that there is a great deal of potential for community engagement with the roads. Villagers at Bengkulu recognize that their lack of road access is a critical restraint to the socioeconomic development of the village; and in the Yogyakarta control area, villagers have been building and maintaining their own village roads for the past 30 years. Community mobilization and involvement, therefore, do 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.

5. Negative Impacts

41. The improvement of roads has encouraged overspeeding by motorists, and thus the frequency of accidents has increased. Most are motorcycle accidents involving youth. Because young students have better access to and communication with others outside the village, they have also been exposed to drugs and other vices. Robbery is also gradually becoming a problem. Like villagers and other motorists, criminal elements have access through these roads, which they can use for easy getaway.

HOUSEHOLD CASE STUDIES FROM ALONG THE PROJECT ROADS

1. This appendix shows how some people have been able to use the road improvements to make their lives better and have the potential to come out of poverty. Yet, other case studies show that the situation is still quite hopeless for other families despite the road improvement.¹

A. Very Poor Households Unable to Make Use of the Road to Move Out of Poverty

2. The following case studies show households in extreme poverty from different project sites. They have still no hope of being able to get out of their poverty status. They have little idea of how to use the improvement in the road condition to better their lives.

Box 1: A Very Poor Family—Sorsogon, Philippines



Mr. Nestor Grita and his wife Ms. Luz Luviria live on a small piece of land beside the project road in Barangay Palale (Sorsogon project site). 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, they had home births instead of hospital births. The eldest attends the high school in the neighboring barangay and the other school-aged children attend the barangay elementary school. Education is a major expense for the household and costs ₱250 a year for the eldest and ₱50 each for the other four. They recognize the importance of

educating the children, and their major aspiration is that all of their children finish at least high school.

Nestor works as a laborer in the community, processing coconut to copra. He works for two tenant farmers but the work is not regular, perhaps 4 days a month on average. He is paid on a contract basis, between ₱100–₱150 per day. They grow some *gabi* (root crop with edible leaves) and yams on a small piece of unused land (0.25 hectares) some distance from the house and must buy everything else they need. They sell *gabi* if there is a surplus, and Nestor does other laboring jobs when there is an opportunity. Luz does not work outside the household. They keep some small animals, the major source of income, to cope with crisis. They currently have 1 hen, 5 chicks, and 1 pig. Nestor recently sold his rooster for ₱80 to have his child treated at the clinic in San Francisco. 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, which damaged their house 2 years ago. They have open credit with a storekeeper in the village and pay no interest so long as the bill is paid after some time. Prices for goods in the village are, however, more expensive than in the Bulan market center. Nestor 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. Luz travels about once a month to Bulan, but usually only if there is some need such as provisions or something for the children.

They 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, only able to use these services intermittently when they have money for purchasing essential items.

¹ Permission was specifically sought from those who have been featured in the case studies to identify them by name and include photographs.

Box 2: A Very Poor Family—Negros, Philippines

Mr. Romulo Olarte's family is typical of families highly dependent on the sugar plantation for livelihood. He and his wife Merlinda have been living in a small hut on a piece of land owned by the hacienda beside the project road in Barangay Magallon Cadre for 26 years. The walls of their house are made of bamboo, floor of packed clay, and grass thatch roof that leaks during the rains. They have 10 children (2–17 years). Two of the children are now living and working permanently in another province to help ease the family's financial burden. Because of lack of income, Merlinda gave birth to all her babies at home with the aid of a "hilot," a village midwife, instead of at the hospital. Out of the five children of school age, only two are attending elementary school in the village: one in grade 3 and one in grade 1. Three are not attending school: one daughter (10 years old, grade 4) and two sons (15 years old, grade 6 and 17 years old, grade 4). The two sons of working age stopped their schooling to help augment the family income. It is clear that poverty disrupts the educational opportunities for children of poor families. Once the children reach working age, they give up schooling for the income they will bring to the family. Husband and wife recognize the importance of educating the children, and despite their financial incapacity, they at least aspire that all their children who are still interested in going to school can complete at least high school education.

They do not own land and so Romulo works as a laborer in the haciendas in the village and surrounding areas, while his wife mainly does household chores. Work is always available for him from September to March during huge planting and harvesting of sugarcane in the haciendas. During these months, he and his two sons together earn ₱200/day to ₱250/day. Due to the relatively large household size, they can barely save money. In the off-season (April–August), Romulo and his family experience food scarcity. They have considerable difficulty in getting work at this time and have to buy everything they need. August is the most severe month for this family to experience food scarcity due to continuous and heavy rain. The family is still fortunate that they have two family members sending them money especially during the off-milling season to bridge their needs until the milling season. It is clear that family networks, especially in times of difficulty, are critical in helping the poor overcome their poverty and offer a social safety net in times of hardship. Most of the poor families in the village are fortunate that a number of small variety stores are ready to provide them with credit during off-season months and charge no interest so long as they are able to pay their bill whenever they have money to do so. Prices for goods in the village are, however, more expensive than in the market center of Moises Padilla. The health of the children is their major concern, and they hope that they do not become seriously ill as they have no money to pay for treatment. They keep some small animals, currently six chickens, as security for when money is needed to cope with a crisis.

Romulo's travels are highly confined to the village, mainly on foot and sometimes by tricycle as most of the haciendas are within a 10-kilometer radius from their house. They recognize that more transport is available along the road now since rehabilitation, but it has not become any cheaper to use. They are only able to use these services intermittently when they have money for purchasing essential items. To save on transport costs, only his wife travels about once a week to Moises Padilla usually only if there is some need, mainly for purchasing provisions or something for the children.

Box 3: A Very Poor Family—Yogyakarta, Indonesia

Mrs. Tumilah is a 50-year-old widow, living with her two daughters of 27 and 22 years old and one son of 13 years old. This is really a very poor family with very bad and unhealthy house conditions, 4 meters x 6 meters, tile roof, wood wall, and ground floor. She works as a farm laborer; for additional jobs, she is a firewood collector. The oldest daughter works as a household helper in Yogyakarta, the capital of the province.

The family has 0.2 hectares of land, which is planted cassava and groundnut. The land is not very productive and is on a slope. Because she is 50 years old, Mrs. Tumilah cannot do hard jobs. She only does planting, weeding, and harvesting. Job opportunities are not always available through the year. Generally, she works 2–3 days per week with 8 hours work per day or 8–12 days per month. She gets Rp2,500 for 4 hours work from 7 am to 11 am or from 1pm to 5 pm. To avoid the cost of lunch, the farmers are not interested to recruit her for a full day. From this job, she gets an income averaging Rp40,000–Rp60,000 per month.

Her normal expenses are Rp3,500 per day for her family's basic needs such as rice, vegetable, etc. so that she needs Rp105,000 per month. She gets additional income from selling firewood, which she collects from her farm or nearest uncultivated land. Other additional income cannot be estimated. Sometimes, she gets Rp50,000 per month, and other times she only gets Rp10,000 per month. Generally, their income is insufficient to satisfy the family's needs per month. To meet the family food shortage, she borrows money from her neighbor farmer and pays back by working at the farm of the lender, or borrows from the intermediaries at an interest rate of 20% per month. She also gets additional income from her oldest daughter. She still remembers that she was not involved

Box 3—Continued

when the road was being rehabilitated because the project did not want to use women. Actually, she was ready to work on the road or any other construction.

Road and Transportation Use. Although job opportunities are not always available, she 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 available every time. 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 good road is it is now easier for her to sell the firewood because many intermediaries come from outside the village to buy the firewood at a higher price than before the road was rehabilitated.

Conclusion. She understands that it is a better situation now after the road is rehabilitated, but it does not give many benefits for her job as she works inside the village. She benefits from the good road only when she goes to the market, while firewood has become more expensive due to higher demand. She does not have any idea how to use the road to make her life better.

Box 4: A Very Poor Family—Kurunegala, Sri Lanka

Ms. Nandawatie and her husband live with their two children (7 and 12 years old) on a small piece of land at the far extreme of the Nugannoruwa Village bordering the tank where they have been living for 35 years. When they first came to the area, they were given permission by her great uncle to squat on the land, which was a state land, and were later given a license. Nandawatie's husband works in the area as a laborer, and she tends their garden crops while working as a laborer when opportunities arise.

They have a small well at the bottom of the garden and grow an extensive variety of crops for their own consumption and for sale. She grows brinjals, which she sells for Rp20 per kilo and chilies, which cost Rp16 per kilo. They use their coconuts for oil and she cultivates beetle, which she sells for Rp25 per bundle. They grow banana plants and sweet potato and buy rice from the local store. Most of their income comes from laboring wages. Her husband is paid Rp150 per day plus food. Whenever they need extra income, they sell vegetables from their very productive household plot. They are wholly reliant upon their garden and laboring for their livelihood.

Nandawatie seldom travels to the nearest town at Nikaweratiya. Her husband cycles the area in search of work, and he goes to the town twice a week to collect groceries. They have one bicycle but would like to get another as her daughter likes to use it too. She acknowledges that goods are cheaper there than in the village. For example, kerosene oil is Rp20 a liter in Nikaweratiya, and Rp20 a bottle in the village store. She travels once every 3–4 months to the town when she needs to buy clothes at the market or when she needs to go to the hospital with the children. She burnt her hand badly on the kerosene lamp during the night some time ago and had to wait to catch the bus to the hospital in the morning as her husband was working away.

Box 5: A Very Poor Family—Bengkulu, Indonesia

Mrs. Kustina lives with her husband Mr. Marin (household head) and three sons (18, 15, and 9 years old). The living conditions of this very poor family are bad and unhealthy (4 meters x 6 meters, grass roof, bamboo wall, and ground floor). They earn their living either by farming, collecting firewood, weaving baskets, or sometimes catching fish using a traditional net. These means of livelihood are all temporary and incomes are unpredictable. They always work hard to get an average net income of Rp100,000 monthly. The oldest son completed elementary school but stopped school for two reasons: (i) the family could not pay for his schooling, and (ii) the oldest son has to help his father earn a living.

Mrs. Kustina said her family did 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 only carry 35 kilograms of crops by pull cart from the plantation to the farmer's house, and this would usually take about an hour. In half a day, they made Rp2,000 only. With the construction of the farm road, they can now bring about 100 kilograms of crops in 45 minutes. This results in about Rp6,000 for half a day's work. The rest of the day is spent weaving baskets,

Box 5—Continued

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 interested in basket weaving, catching fish, and collecting firewood than working as farm laborers. As farm laborers, they received a maximum of Rp3,000. After the farm road was built, they preferred working as laborers since they earn about Rp6,000 per day. They do not want the farm road to be asphalted because when the farmers use pick-ups to transport their crops, the opportunity for carrying will be reduced and there will be less work.

The family income did not increase as the traders or farmers did. 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 people do not use baskets anymore. The best source of income for the family now is collecting firewood. Mrs. Kustina said that she knows of six other families who are in a similar condition to her family.

B. Poor Households Making Use of the Road with Potential to Move Out of Poverty

3. The following case studies show some families using the road as a means to better their lives.

Box 6: A Household Making Use of the Road and with the Potential for Moving Out of Poverty—Sorsogon, Philippines

Mr. Ely Bon and his wife Ms. Luz have seven children. They have lived in their current house beside the road for 3 years. They do not own the land, but have built a



simple two-room hut on vacant land. Their home has a tin roof and wooden walls. They moved to this part of Barangay Palale 7 years ago from Patag, a remote part of the barangay. They thought that opportunities would be better here closer to the center of the barangay though they say that they did not consciously move to be close to the road. They previously squatted in an adjacent plot for 4 years, but were moved on and settled here.

In Patag, both Ely and Luz had been laborers. Ely now works periodically as a laborer, processing copra for tenant farmers in the vicinity, but the work is not regular. He also mines sand from the nearby river and sells to a local storeowner for ₱3 per can. He had

three orders for 50 cans of sand last year. The sand is transported to Bulan, the nearest marketing center, and is used locally in house construction. Ely is a carpenter and supplements his income by making furniture for local people. He also labors for house construction. He had two orders last year for cabinets, for which he was paid ₱1,300 each. The cabinets take him about 1 week to make, and he charges extra if he provides the materials. The business is more profitable than unskilled laboring. Since they have no land to cultivate, they receive vegetables from neighbors but must otherwise buy everything from stores. Ely travels at least weekly to the Bulan market center to buy foodstuffs (rice and fish). They prefer to buy from Bulan as the prices are cheaper than in the village, though they buy small quantities of things they need from the local store periodically.

Luz has recently started a business trading in bananas. She buys from farmers in the interior of the barangay in Patag and carries them down to the road. From there, she hires a tricycle and transports them to Bulan where she goes from shop to shop selling them. She started this business only 4 months ago, and goes approximately once or twice a month when she has capital to buy bananas. She doubles her investment as she buys the bananas at ₱300 and sells them in Bulan at ₱600. The transportation cost by tricycle is ₱74 for herself and the freight. As far as she knows, she is the only woman in the barangay doing this and has been helped in developing this business by the ready availability of tricycles in the village now. This business has potential, she feels, as she can easily sell all the bananas she brings to Bulan. This trade is the primary reason for Luz to travel outside the barangay; otherwise, she only goes to Bulan if the children require medical treatment.

Box 6—Continued

Although still very poor, their household income has fluctuated significantly over the past year. They periodically receive cash through Ely's cabinet making and now increasingly from Luz's banana trading. This allows them to recover from debt and even buy some household possessions. Ely bought a karaoke machine some time ago, although it has not often been used and is currently pawned to a neighbor in the village as they needed money for food and medical expenses. They invest in their children's education, aspiring for them to finish high school. Ely finished only grade 5 and Luz grade 6.

Box 7: A Household Making Use of the Road and with the Potential for Moving Out of Poverty—Kurunegala, Sri Lanka

Mr. Piyadasa, 50, his wife Karunawathie, 49, and their 18-year-old daughter make up their household. They are one of the very few families in Nugannoruwa who have completely given up farming despite owning both paddy and *chena* lands. The primary occupation of the family is a confectionery enterprise. About 10 varieties of sweets are made and marketed by the family. Piyadasa has the responsibility of traveling to Nikaweratiya to purchase all the necessary raw materials such as rice, sugar, oil, etc. He does not have to transport firewood as it is delivered to their house as they buy in bulk. Karunawathie is responsible for the preparation of the sweets. They take it to the market to sell.



As can be expected, transport is crucial to the functioning of the business. Piyadasa makes over four trips a week to Nikaweratiya to buy raw materials. Karunawathie and Piyadasa together make three trips a week to market the produce. As

such, 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, Piyadasa 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 Rs20 is made on days that he carried more than one gunny bag of goods. When traveling to the market with the products, they prefer the use of a 3-wheeler to Nikaweratiya and Anamaduwa markets. They spend a total of Rs400 for the two trips. This is a special rate fixed with their regular 3-wheeler man. The return trips are made by bus as they have no cargo. This costs them about Rs75. The trip to Puttlam is done purely by bus as it is a 45-kilometer trip. They take the 6 am bus to Nikaweratiya and then take 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 visiting more markets. A major constraint to further expansion is Karunawathie'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. There is minimal furniture in the household: 12 plastic chairs are stacked in a corner of the front space and the single bed is in a back space of the house. If judged visually, it would seem that the quality of life of this household was lower than the village average. However, Karunawathie felt very strongly that it was 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 it was acknowledged that they had to buy all consumer goods including rice, they had 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 the motivation to be sustained by a livelihood strategy that is not dependent on rainwater nor threatened by elephants. Karunawathie considers the ability to move away from nonviable farming and to have the motivation to take advantage of opportunities available as a 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. But they don't. Even my sister who is a widow will not do it. We have to help her financially."

Box 8: A Household Making Use of the Road and with the Potential for Moving Out of Poverty—Negros, Philippines

Mr. Ricardo Valenzuela and his wife Mariethel have one child. They have been living in their current house, which is made of 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, his home place after their marriage in 1995. He was then helping his parents in their farm and doing carpentry works in his hometown. His mother-in-law encouraged him to move his family to Barangay Magallon Cadre in 1998, as at that time, the local government gave free access to land for those with a family who wanted to relocate in the village. The family of his wife is from Magallon Cadre.

As they have no land to farm in Magallon Cadre, he works as a carpenter, accepting wages of ₱100 per day provided the food is free. He gives priority to carpentry work than wage laboring in a hacienda as the wages for the former are much better than the latter. If carpentry work is not available, he does not mind laboring in a hacienda. As a farm laborer, he only earns ₱70–₱100 per day without food, depending on the nature of the job. Recently, he has 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 expands substantially his earning capacity. He is known to be a reliable carpenter in the village.

Though he was not in the village before the road rehabilitation, he 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. 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 locally 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 crops or vegetables of their own.

Due to lack of capital, Mariethel is sometimes engaged in peddling various foodstuffs such as salted or boiled peanuts and salad jackfruit since their arrival in the village, which she herself prepared or processed. All she needs is a capital of ₱1,000 to start a peanut business. She usually engages in this business from October to December in the town proper and surrounding areas, coinciding with peak supply of peanuts. During these months, she can easily earn a net income of ₱300–₱400 in a day from a capital of ₱1,000. When there is no cheaper supply of peanuts, she shifts to making and selling jackfruit salad. She can also earn as much as 40% on her capital, but she can only do this in a much reduced scale. Her transport costs from the village to the town proper and vice versa of ₱10 is affordable as long as she has a business. For the whole village, there are only two of them doing this kind of business. The availability of a tricycle has enabled her to move to 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 only goes to the town proper with her husband to buy essential household items.

Although still poor, they are slowly finding ways to increase their household income. They feel they would have enough resources for their 5-year old daughter to obtain a college degree if they can expand their business connections in the village. Mariethel 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 that ultimately expands their livelihood capacities.

Box 9: A Household Making Use of the Road and with the Potential for Moving Out of Poverty—Yogyakarta, Indonesia

Mrs. Yuliana Sukarta lives in Candirejo Village with her husband and three sons of 17, 15, and 5 years old. She has been a teacher at the elementary school of Kakung Village, 14 kilometers from her residence, since 1989. She has used the study road before and after it was rehabilitated.

Situation Before Road Rehabilitation. From 1989 to 1995 before the road was rehabilitated, she used two methods of public transportation to go to school everyday. She left for school at 6 am using the open pick-up to Semanu and arrive there at 6:45 am. At Semanu, she needed to wait for about 20–35 minutes for other route to Kakung by the same kind of transportation. From Semanu to Kakung, she took about 30 minutes which means she needed to travel about 95 to 110 minutes everyday.

She often arrived at school late or could not go to school due to difficulty with transportation. If the first open pick-up at 6 am was fully loaded or she came to the street late, she had to wait for the second one at 8 am, and would

Box 9—Continued

arrive at school at 9:50 am; making her 2 hours and 20 minutes late. The third and last pick up would come at 10 am. The open pick-ups from Semanu came back at 11 am, 1 pm, and 3 pm.

The school ends at 1 pm so she had to use the last pick up from Semanu to her home, and she would arrive at home at 3:45 pm, therefore, she spent 9 hours and 45 minutes per day for her job as a teacher. She spent a total of Rp7,000 per day for her fare.

Situation After Road Rehabilitation. Since the road was rehabilitated in 1996, it has been very easy for her. There are so many public vehicles everyday. She leaves for school at 7 am and arrives at 7:30 am. After school, she arrives home at 1:30 pm. She spends Rp2,000 per day as fare. She teaches 24 days per month on average. Comparing before and after road rehabilitation since 1996, she saves Rp5,000 per day, and 2 hours and 15 minutes. Since 1997, she has done makeup for bridal couples as her second job in the afternoon. She does the new job inside and outside the village, and she has no transportation constraints. She gets orders for about 5 to 11 days per month with an average net income of Rp2,200,000 per month. The other additional job is doing farming on the sharecropping system. She works with farmers and gets an average yearly net income of Rp1,500,000.

Conclusion. Mrs. Sukarta uses the road very well. She has received many benefits from the road and transportation improvements, specifically in encouraging her in her new job and improving her income.

C. Cooperative Society as a Safety Net for Poverty**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 cooperative is state sponsored, and started here in the village on 1 March 2001. It grew out of a project called “Dairy Milk” which 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 and 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. Subasingha (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 Kuliypitiya where the milk is sold to a factory that processes flavored milk, yogurt, etc., and also supplies Nestle.

The peak season for the cooperative is January–April, the wet season, when cows produce 50% more milk. Members are paid Rp25 per liter for buffalo milk and Rp13 a liter for cow’s milk depending upon the fat content determined by Mr. Subasingha using a simple centrifuge. The other main outlets for milk in the neighborhood villages are the motorscooter milk traders who ply their trade along the road. They will pay Rp22–Rp23 per liter for buffalo milk and Rp10–Rp12 per liter for cow’s milk. There is an economic incentive, then, 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 intermediaries do not guarantee that they will purchase everyday nor 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 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 the vehicle. Given the necessity of transporting fresh milk quickly, the road is important in making the whole

Box 10—Continued

enterprise viable. 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 current long dry spell too, the development of the milk cooperative and the guarantee of good access for the truck means that villagers have an important alternative source of income while their lands remain dry and unproductive.

D. Households Successfully Moving Out of Poverty

4. The following case studies show households that have moved out of poverty using their length of residence and asset base.

Box 11: A Household Successfully Moving Out of Poverty—Negros, Philippines

The family of Mr. Rolando Labarga 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 for the village for more than 25 years. Through the joint efforts of Rolando and his wife Sarianita, they were able to raise and provide education to all their children. They have 11 children with ages ranging from 5 to 28. The eldest is married with two children, with his house just behind Rolando's. As the eldest, he actively helped in their business to raise enough money for the education of his younger brothers and sisters. Consequently, he only completed first year of college education (11 years). Three children completed college degrees; two are employed in Manila, and one has just completed a degree in education. Out of the 6 children of school age, only 5 are currently studying: 2 are in high school and 3 in elementary. The one not attending school completed his 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 will start attending college this coming school year. Their youngest son is not yet of school age.

Their current house is situated along the barangay road 75 meters from the project road and is made of cemented floor, wooden walls, and galvanized iron roof, which was built some time in 1990 in one of the hacienda's vacant lots. This is their second house on the same piece of land. Their first house was built in 1974 after their marriage. As it was just a small hut and after saving much money, Rolando felt the need to have a bigger house as his family grew bigger. They are one of the few families in the village with no member of their household working in haciendas.

Fish trading was his wife's idea as she came from a fishing village in Himamaylan. Sarianita started peddling fish in a basket around the village right after their marriage in 1974, with Rolando accompanying her in buying and transporting fish from Barangay Sarait, Himamaylan. As fish demand in the village increased, so did Sarianita's volume of sales. Then she had difficulty physically peddling the fish so she started scouting for a location for a fish stand. In 1986, Sarianita and her husband constructed a makeshift fish stand with just a table and temporary roofing along the project road in the village. Together they left the village for barangay Sarait, Himamaylan at 9 am everyday by renting a tricycle at ₱120 per return trip and back to the village at about 1 pm to 2 pm, 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 of 40–50 kilograms (kg) per box. They start setting up the fish at their stand at 3 pm and close it at about 6 pm. In days that they have a fish surplus, Sarianita peddles the fish in the village or simply dries the fish for sale over the following days. The price of fish that they sell ranges from ₱50 to ₱120 per kg. They usually have 20–30% marketing margin for every kg of fish. At the end of the day, they have earned at least ₱350. Their fish stand is becoming the center of village information as people usually exchange information while buying fish.

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

Before project road rehabilitation, there were only two to three tricycle owners in their village; now there are about 25. They can now leave home at mid-morning instead of early morning to be at the fish-landing center. About 30% of their customers are project road users. People traveling to barangay Cabacungan, La Castellana, and Canla-on City now and then stop at their fish stand to buy fish.

Box 12: A Household Successfully Moving Out of Poverty—Sorsogon, Philippines



Mr. Jesus Gripon is a tenant farmer of coconut in the Patag area of Barangay Palale, with 6 hectares (ha) of land. His house and land are situated at the end of a track running up from the project road. It takes approximately 20–30 minutes to walk one way, and up to 1 hour when transporting goods. Patag is the agricultural hinterland of the barangay, accounting for 70% of the agricultural output of the area. Jesus lives with his wife and five children, and has a strong family network in the area. His father and brother are also tenant farmers. His father has been farming the same 12 ha for 22 years and Jesus for 6 years.

Jesus is required to sell his coconut to his landlord in Palale and has other lands and tenants throughout the area. The landlord buys the product and sets the price. He receives ₱10 per sack. The price in Bulan is ₱10.60. However, he is only required to transport the produce down the track to Palale. The owner transports it on for further processing in San Francisco. He feels that it is a fair arrangement as there are no transportation costs for him. The standard division of the crop is a 50/50 split between the landlord and tenant, though in Jesus' case, a 20% reduction is made by the landlord for "moisture content," so the split is 60/40 in the landlord's favor. Other tenants are free to sell their copra to other buyers, but landlords provide good credit to tenants before harvesting against the next crop.^a

From the money he has made from copra, Jesus invested in a chainsaw in 1998. He paid ₱30,000 and now operates a business in cutting down old coconut tress for timber for house construction. He makes timber planks and sells them for ₱100 per slab. He also started a business 8 years ago, trapping and selling birds from the forest. He does this every December and sells to a shop in Bulan from where the birds are sold as pets. His connection with the shop is now so good that he catches birds to order only though during December. He spent ₱200 on traps initially and now sells the birds for ₱100 each. Jesus is in no doubt that the better road between Bulan and Palale has made the development of these small enterprises easier, as transportation is quicker and more readily available. He travels more regularly, and people come to the barangay more regularly too so communication has improved in both directions.

Patag does not have a road link to the main barangay center and the project road. However, there was a road constructed over 2 kilometers in October–November 1986. The road was constructed for better access of a government official to his land in the area and a jeep operated along the route for a few months in 1987. This service soon stopped, however, as the road deteriorated. Local people had undertaken maintenance for some time, but landslides affected the road, fewer people were able to contribute labor, and they lacked basic tools and machinery to undertake the work. Jesus feels that a road simply was not a priority for people. If they spent time maintaining the road everyday, livelihood activities would suffer and the benefits from the road were not large enough to make this worthwhile.

Jesus has been offered 3 ha more elsewhere to farm on a tenant basis, but is unsure of whether he can legally farm more land. He has no doubt, however, that he could manage the additional land as his brother and family would help. Family networks and connections, both in times of difficulty and in providing agricultural labor, are clearly critical here in helping the poor overcome their poverty and in offering a social safety net in times of hardship.

^a Coconut is harvested approximately every 2 months, so six crops in a year is possible.

Box 13: A Household Successfully Moving Out of Poverty—Matara, Sri Lanka

Mr. Nimal's family has been living in Heegoda for generations. He does not have any land himself, but his family has 2.5 acres of tea land. In 1993, he had just left school after completing his advanced level examination when he was chosen to be trained as an Assistant Tea Inspector by the Tea Smallholder Development Authority (TSDA). The program was one of the many inaugurated by the State in the aftermath of the political unrest of 1989. Along with 18 others from the Pasgoda Divisional Secretary's Division, Nimal was trained for 9 months in every aspect of the tea industry. As part of the practical training, the trainees were expected to set up small tea plant nurseries in their home plots. They were provided with watering cans, plastic for making baskets for the plants, and 4 kilograms of fertilizer.

Once the training was completed, Nimal continued with the tea plant nursery and developed it with the aid of the officials he had met during the training. A partnership was formed with two of his friends based on labor sharing.

Box 13—Continued

However, the location of the nursery in Nimal's home garden on the slopes of Thannehena was not conducive for expansion. Customers were limited to those who had tea holdings in the area and did not mind headloading the



saplings. They decided to relocate the nursery closer to the road where better access would enable customers to load saplings on to trucks and other vehicles. They rented 30 perches of state land just by the road for the very nominal cost of Rs300 per month. "Sales have gone up dramatically and we now have over 115,000 plants. We don't even need the help of TSDA to find buyers," he says. In addition to the new location by the roadside, the constant encouragement and transfer of information by the extension officers of TSDA has been the main factor in the success of Nimal's enterprise. He frequently visits the TSDA office in Matara to keep in touch with the officers as well as be updated on new techniques, assistance schemes for tea sector enterprises, etc. "I got to know these officers

during the training. I have since then kept in close contact with them. The extension officer visits the nursery at least once a month. He will sometimes stop if he is passing on his bike and sees us in the nursery. I go to the office to meet the other ladies and gentlemen. If they feel you are working hard and you listen to them, they are very good to you and love to help you."

In addition to being a good source of income, the tea plant nursery needs extensive labor only during certain periods of the month. This leaves Nimal with time to engage in other income-generating activities. Transporting locally produced treacle to town is one such activity. During the period when treacle is very cheap, he buys about 70 kilograms which is the maximum he can transport by bus and sells it to shops in Ambalangoda town where the price remains high throughout the year. When the price is good, he makes as much as 75% profit on the trade.

E. Vehicle Operators

5. The following case studies indicate that nonpoor households have invested in vehicles to take advantage of the road.

Box 14: A Vehicle Operator—Bengkulu, Indonesia

Mr. Supardi has been living in Talang Kabu Village for a long time. He started working as a driver in 1993. He is a head of household with a wife and two sons. He looks like a successful driver with a good house. During 1993–2000, he drove a closed pick-up with a capacity of 11 passengers. Since the end of 2000, he has been driving an open pick-up for freight transportation. The frequency of trips did not change before and after asphaltting. He did one round trip a day from Penago to Bengkulu. The differences before and after asphaltting are given below.

Situation Before Asphaltting. He explained that before the asphalt road he did not have competition. The pick-ups were very limited, and it was easy for him to get passengers. His car was fully loaded everyday with more than 17 passengers. For one round trip per day, he gets around Rp51,000 (2 x 17 x @ Rp1,500) and from the passengers' freight around Rp25,000, totaling Rp76,000 (with \$1 equivalent to Rp2,300). The average driver's income is Rp15,000 per day. Everyday he needed 14 hours for driving (7:00 am–9:00 pm). He needed to repair his vehicle every week and spent 1–3 days on each. Consequently, he drove for around 12–18 days a month and the other days were used for vehicle repair and rest for himself.

Situation After Asphaltting. After the road was asphaltted in mid-1997, he has had a lot of competition with many other pick-ups, trucks, and other kinds of vehicles for passenger and freight transportation. He gets about 13 passengers a day, and they do not want to pay for freight under 30 kg per person. For one round trip, he gets around Rp260,000 (2 x 13 x @ Rp10,000) and from passengers' freight he gets around Rp5,000, totaling Rp265,000 (with \$1 equivalent to Rp10,000). The average driver's income is Rp50,000 per day. Everyday, he needs 8.5 hours for working (7:45 am–4:15 pm). The condition of the road is advantageous for the vehicle. He needs to repair his vehicle only twice a month and spends 1 day on each. Consequently, he drives for around 24–28 days a month. The other days are used for vehicle repair and taking rest.

Box 14—Continued

Conclusion. After asphaltting, he can save 4 hours per day for taking rest or other activities. The other benefits are that the vehicle is more durable, he does not need to do repairs every week so he can work for about 28 days a month, and the expenses for vehicle repairs have decreased by around 200%. Income has increased by around 300% for the driver.

Box 15: A Vehicle Operator—Matara, Sri Lanka

Gnanatilake operated the only form of public transport on the Katuwana Road since it was first broadened and tarred in 1994 until the road was rehabilitated in 2001. This was a 5,000-kilogram Elf truck which had been converted to an 18-seater dual-purpose vehicle by adding parallel seating, steps, a metal-framed roof, etc. This bus ran on a permit and timetable issued by the provincial road authority.^a As the only form of public passenger and cargo transport available, the operation made a good profit until 1998. From 1998, profits started falling as the cost of maintenance of the truck increased substantially due to the condition of the road aggravating the repair cost that increased as the truck aged.

The takings of the truck also dropped as the passengers on the main roads preferred to use the regular buses—which over a period of time had increased on the main roads—than climb on to the truck. Hence, the core of passengers came from the villages along the Katuwana Road. When the condition of the road deteriorated to the extent that he had trouble running his truck, he took the step of personally spending over Rs40,000 to surface the impassable sections of the road. He carried out routine maintenance such as shifting rocks on the road.

When in 2001 the road was improved to the extent that it made possible the running of a bus, Gnanatilake sold the modified truck and bought a single-door minibus to ply the same route, using the same permit and timetable. His fleet now includes the truck he has hired out to the Kiruwanaganga estate to carry laborers from the villages along the Katuwana Road to the estate. This truck is modified to carry passengers and is insured at a rate of Rs50,000 per passenger for 24 passengers. This cost, as well as all running and maintenance costs, have to be borne by Gnanatilake. He earns a rate of Rs1,450 per day from the tea factory. While the improvement of the road has opened up opportunities for him to expand his vehicle-based business, he admits that the competition in terms of more public and private buses operating on the road will be a challenge that needs to be faced. As long as the road was in a deplorable condition, no other operators threatened his monopoly. Now, however, both the private and state sectors have moved in within 4 months of the road improvements, and two more buses and about 10 more vans/trucks that service the tea wage laborers have started operation. Gnanatilake foresees at least one or two more state and/or private buses plying the route. He is currently thinking of ways to meet this challenge.

By 2000, Gnanatilake was running into serious problems with regard to the profitability of the operation due to the excessive costs of vehicle and road maintenance borne by him. It was during this time that he heard that a road improvement project was being launched in the Southern Province and the selection of roads was in progress. Gnanatilake immediately mobilized all resources at his command to ensure the Katuwana Road was selected for the project. He approached the village monk to help in drafting the petition and accessing the relevant authorities. Mobilizing support from the villagers did not pose any problems: "All the houses near the road, as well as on the slopes, were very willing to participate in the signature campaign. They all felt the need for the road." The road was selected for the project and work was completed in 2001. While Gnanatilake is very pleased with the dramatic improvement in the condition of the road, he still remains vigilant about its maintenance.

^a Carrying passengers in modified trucks is possible only under permits for special travel requirements such as pilgrimages. These permits are issued for a specified period of time. The Southern Provincial Council has made an exception and issues permits for modified vehicles to carry passengers.

Box 16: A Vehicle Operator—Kurunegala, Sri Lanka

Lalith owns the only vehicles in Nugannoruwa. He has a truck, which he uses for collecting cow dung, and a minivan, which he bought after selling his tractor 2 years ago. Lalith's is one of the better-off families in the village. He has a land of his own and also married into another landowning family. He has about 15 acres of paddy land, but like others in the village, has not farmed for a couple of years because of the severe water shortage. He currently only farms his *chena* (dry) lands for household food. In the meantime, he has developed both of his transportation businesses to compensate for the lack of farming, and his income now is at least equal, if not better, than previously.

Box 16—Continued

Lalith bought the second hand truck from 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 Lalith started 2 years ago. Villagers were well used to selling the dung by this stage, and he has no problem with supply. He employs three people in this business to drive the truck and collect the cow dung, and he collects a truckload from along the road everyday. Once collected, the dung is sold to farmers along the roads in Kalpitiya, a vegetable-growing region where the demand for manure is high. Lalith says that he can easily sell the manure, but that 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 Rp500 for one truckload of dung, and makes about Rp1,000 after deducting his costs. For villagers who have about 25 cows, it may take up to 2 weeks to collect half a truckload. For families with only a few cows, they get together with others to fill a truck. He started the business once the road had already been rehabilitated, so he says he cannot comment on the road improving his business, but feels that the completion of the bridge further along

the road (undertaken by the project) has had an 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.

Lalith bought his van about 1 year ago. He does not use it for business daily, but hires it out fairly frequently to villagers. The most popular trip is to Anuradapura for pilgrimage for which he charges Rp2,000 for hire. He makes this trip about once a month. He also takes villagers to the south and to the coast for which he charges Rp5,000. 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 Lalith 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 Rp250 to the Kotawehera Hospital, and Rp400 to Nikaweratiya. Villagers always pay as promptly as they can.

F. Case Studies of Traders Using the Road Successfully**Box 17: A Successful Trader—Yogyakarta, Indonesia**

Mrs. Peti, 40 years old, has been living in the village since 1990 with her husband. She has a 10-year-old daughter and a 4-year-old son. Her mother is 65 years old. She has been successful with her kiosk and truck.

Situation Before Road Rehabilitation. This family was a poor family. She started to build her family business with her husband in 1990 when the road was still bad. She did not work everyday and just sold meals once a week at a weekly market inside the village and was unemployed 6 days a week. Her husband works as a motorcycle (*ojek*) operator at the route of Candirejo to Semanu (7 kilometers). The motorcycle was the main family income earner. The family income ranged from Rp25,000 to Rp100,000 a month.

Situation After Road Rehabilitation. The family started a business in 1997 selling sugar, coffee, rice, and other villagers’ daily needs. A good road and a lot of public transportation has been an advantage for her to go to Semanu (capital of the subdistrict) and Wonosari (capital of the district) to buy things those needed by villagers. The capital to start the business was limited, and came only from her husband’s earnings as a motorcycle driver. Nevertheless, the business grew very well and quickly, and in 1999 she started to multiply her business supplying agricultural input for the farmers inside the village. She provided fertilizer and pesticide for the farmers. Since 2000, she has been supplying the three villages of Candirejo, Giri Panggung, and Balong. To give better services to customers, she decided to buy a truck in 2001 for transportation to remote areas with big orders. She is supplying many farmers’ groups in those three villages. Another business of the family is buying crops from the farmers in the three villages, for instance rice, groundnut, and soybean. She sells the crops to Yogyakarta and/or Semarang.

At present, the family income is estimated at around Rp2,500,000 per month, a large difference from before 1996. She explained that it was very difficult to develop business activity before 1996, because of transportation

Box 17—Continued

constraints. It was difficult to go to Semanu and Wonosari to buy and difficult to give a good service to a village that has a transportation problem. The family is still building the house and extending the store. The family is very successful in using the road and taking advantage of better transportation. She understands that the road has played an important part in the rapid development of her business. She hopes that the community can also take advantage of the good condition of the road and public transportation.

Box 18: A Small Trader—Bengkulu, Indonesia

Mr. Anwar is an intermediary who collects paddy, coffee, and rubber from farmers. He is a head of family with five members. His business started 15 years ago. He does not have capital for his business so he is very dependent on traders (moneylenders) from outside the village who lend the money to him. His bargaining position is very weak in negotiating the 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.

Situation with a Bad Road. He said that both the main road and the farm road (Tree Crop Smallholder Sector Project [TCSSP] Road) give benefits to him in managing his business. Before the TCSSP road was built, they had to carry the crops on their shoulders; this was expensive 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 carrying crops. The main road before 1996 was not asphalted. There were very few pick-ups that came to the village and trucks were very rare. He 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 to work 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.

Situation with a Good Road. Since the farm road was built by TCSSP, he 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 (i) the cost is 25% lower, and (ii) 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 everyday if the crop is available. Normally, at the moment, he sends the crops for selling twice a week during the year. He gets a monthly income of Rp650,000. 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 who have started in the same business.

The problem for him is lack of capital in extending his business. He got the capital from a moneylender at 25% interest per month, and he has to sell the crops to the moneylender from a very weak bargaining position. He tried to borrow money from a formal bank, but was unsuccessful. The bank needs collateral and has 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. The rubber he buys 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 KUD (Village Unit Cooperation), the price is Rp1,850 per kg.

Mr. Anwar said that the present condition of both the main road and the farm road is good enough for his business. Both roads help him carry out his business. Although he cannot improve his business to the level of the bigger trader, he thinks his business and family income have been better since both roads were improved. His main constraint is lack of capital.

Box 19: A Successful Trader—Bengkulu, Indonesia

This is a rich family that has been successful in business; it started in 1997 after 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 field, coffee plantation, and rubber plantation. In supporting the business, the family also provides the pick-up.

Situation Before Asphalted. Before he started his business at this village, the family left the village for 4 years in 1993–1996 to do business outside the village. Mr. Niran said that Talang Kabu Village was bad for business before 1996. A lot of agricultural production could not be sold outside the village. They had to transport the crops on their shoulders or by pull carts. Because of difficulties of transportation, he lacks information, communication, and business opportunities. That time, the family stayed at Benuang Galing Village, North Bengkulu, about 150 kilometers from Talang Kabu Village. The 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 at North Bengkulu.

Box 19—Continued

Situation After Asphaltting. 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. The business started with a small capital of Rp1,500,000 (around \$562 at the rate of Rp2,300 per \$1 in 1996). The family bought coffee, rubber, paddy, corn, and other crops from farmers in the village. He took advantage of the better transportation conditions. He rented the pick-up or a truck for crop transportation from the village to Bengkulu once a week at the end of 1996 with the family making a net income of Rp500,000 per month. In 1997, the volume of his trading increased as did the frequency of crop transportation to an average of twice a week, and he made a net income of around Rp1,250,000 per month.

Despite the monetary crisis of 1997, production of agriculture increased. He took the opportunity to multiply his trading volume so that from 1998 to 2002 the frequency of his trading transportation 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 pick-ups and one rice milling machine for extending the business. He said that he is not in competition with the other trader inside the village because he is a bigger trader and he helps the other traders with capital to expand their business. He buys paddy at Rp950 per kg from the farmers and sells it at Rp1,200 per kg to the main trader at Bengkulu. If the farmers sell to the market, the price is Rp1,000 per kg. The rubber he buys from the farmers at Rp1,750 per kg and sells it at Rp2,100 per kg to the main trader at Bengkulu. If the farmers sell to the KUD (Village Unit Cooperation), the price is Rp1,850/kg.

The family uses the road facilities very well, both the main road built by the Public Work Services and the farm road built by TCSSP. Mr. Niran and his wife said that their pick-up brought paddy from the rice field to the rice miller, and coffee from the plantation to their house. It was impossible to do this before the farm road was built. They said that they and other traders would benefit more if the Government improved the farm road and main road; they are ready to contribute to it and to persuade the other traders to do likewise.

G. Case Studies of Professionals Using the Road Effectively**Box 20: A Teacher—Yogyakarta, Indonesia**

Mr. Sidik is a teacher who has lived in the village with his family for about 15 years. He also farms for a secondary income.

Situation with the Bad Road. He said 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 lazy to go to his plantation in the afternoon after school. Normally, he went to the farm once a week on Sunday. Farming was not done well, crop production was very low, and he got just a small additional income from this. His job as a teacher is helped by the main road, which crosses 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. A few pick-ups and trucks that used the road did not serve passengers for short trips. They only served passengers who went to and from Bengkulu.

It took him 90 minutes going to school and 90 minutes coming back everyday. School begins at 7:30 am and closes at 1 pm so that he left his home at 6 am and come back home at 2:30 pm. He struggled to go to school for 6 days a week in the dry season. But 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 week. The head of school and other teachers knew of the conditions in the area and understood his constraints.

Situation with the Good Road. Since the farm road was built in 1994, he has gone to his farming everyday after school. His wife and his oldest son go to the farm in the morning. They planted coffee trees and dryland paddy between two lines of coffee trees. His 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 problems in going to school. He does not have to walk to and from school; he used public transportation everyday. Many pick-ups from the village go to and from Bengkulu. It takes only 15 minutes each to go to and from school. Everyday, he leaves his house at 7:15 am and after school he arrives home at 1:15 pm. He goes to school 6 days a week at the dry season and rainy season. He pays just 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.

The farm road has no impact on his main job as a teacher, but it helps him improve his economic condition through farming. The main road gives him a significant benefit, specifically for his main job as a teacher.

Box 21: A Nurse—Yogyakarta, Indonesia

Mrs. Suryatini is 40 years old, living in the village with her husband and two daughters, 12 and 7 years old. She is a nurse in Candirejo Village consisting of 20 subvillages. She has been working in this job for about 14 years.

Situation with the Bad Road. For her job, she has to meet people in 20 subvillages and she has to attend a weekly meeting at the subdistrict center. From 1988 to 1995 before the road was rehabilitated, she had difficulties in going to Pacarejo to attend the weekly meeting with the doctor and other health center officials. She needed 2 hours for a return trip as she had to walk. In servicing the 20 subvillages, she spent more than 3 hours going back and forth from each remote subvillage as there too she had to walk. There are 20 community group health services, one for each subvillage. Because of the bad road, the villagers also found it difficult to meet the nurse at the village health center to get extension services. She had a schedule of visiting the 20 subvillages 20 days a month. In the dry season, it works fine for about 7 months a year, but in the wet season it does not work well at all, as the road becomes very bad then. Often, a housewife would have to give birth without a nurse because the nurse could not get there in time. She did not regularly attend the meetings at the district health center because of the road and transportation problems, especially in the rainy season.

Situation with the Good Road. Since 1996 when the road was rehabilitated, it had become easier for the nurse to visit all the subvillages. She can use a motorcycle and spend only 15–30 minutes on the trip. Each day she can visit three subvillages for health extension services, and preventive care of children and pregnant women. The program can be managed well in both the dry and rainy seasons. People can also come to the village center to meet the nurse, with the result that she can give a better service with access to better tools and facilities. At present, all pregnant women give birth at the village health center. Normally, the pregnant woman comes 1 day before the last day of pregnancy. The nurse can always attend her weekly meeting at the district health center.

The road condition has helped the nurse do her job well, and there are better health facilities available for the villagers.

Box 22: An Extension Service Officer—Yogyakarta, Indonesia

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

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

Situation with the Better Road. After farm roads were built by the Tree Crop Smallholder Sector Project at Talang Kabu and Penago villages, it helped him do his job. It is very easy for him to visit farmers in the rice field, plantation, and/or their settlement. He goes to one or two locations per day by motorcycle, so he visits each of the 20 areas twice a month in the dry and rainy seasons. In terms of his annual program, he met more than 90% of his target, so that the farmers get information they need about agriculture 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 agriculture technology based on the technical guidance from extension services, and apply fertilizer, pesticide, etc. Production has increased and they sell the crops at a better price at Bengkulu and/or other markets outside the village.

The farm road and main road have given him benefits. Both roads help him carry out his annual program. He can serve the farmers easier in the field and/or at their settlements, and he can manage his time for attending important meeting at subdistrict and district levels.