Do Rural Infrastructure Investments Benefit the Poor?

Evaluating Linkages:

A Global View, A Focus on Vietnam

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ABSTRACT

What is the evidence on linkages between rural infrastructure investments and household welfare? In the past, most evaluations conducted after project completion have focused on physical outputs and success of project implementation to assess the efficacy of a project. In recent years, greater attention has been given to investment *impacts*, specifically, the impacts of investments *on the poor* both in economic and non-economic/social terms. This paper will present key ideas from a survey of the existing literature on such impacts.

In brief, though evidence does exist for improved household welfare from rural infrastructure investments, relatively little evidence was found of studies that provided concrete linkages between specific investments in rural infrastructure and increased welfare of the rural poor. This is due in large part because of the complexity and oftentimes, the concurrent nature of interventions that make attributing welfare improvements to a particular project or program virtually impossible.

The evidence, such as it exists, is presented in this three-part paper. **Part I** gives examples of past and current attempts to assess the impact of rural infrastructure projects and provides suggestions for future evaluations. **Part II** discusses in greater detail some observed economic and non-economic/social impacts on the poor from different rural infrastructure interventions. The last part, **Part III**, presents lessons learned from the literature on how to maximize the impact of rural infrastructure interventions on household welfare. In all sections, specific project and/or country examples from the literature as well as new data from a recent qualitative study in Vietnam, will be presented as evidence for and illustration of key ideas and issues.

Acronyms

BHQ	Basic household questionnaire
DFID	Department for International Development, UK
GNP	Gross National Product
ICT	Information and Communication Technology
IFAD	International Fund for Agricultural Development
IWMI	International Water Management Institute
LPG	Liquefied petroleum gas
MOLISA	Ministry of Labor, Invalids, and Social Affairs
NGO	Nongovernmental organization
OED	Operations Evaluation Department
PMU	Project Management Unit
PPMU	Provincial Project Management Unit
PROSABAR	National Rural Water and Sanitation Project, Bolivia
PRSC	Poverty Reduction Support Credit
PRSP	Poverty Reduction Strategy Paper
PT	Public transportation
RE	Rural electrification
RTP	Rural Transport Project (Projects I and II, Vietnam)
UNCDF	United Nations Capital Development Fund
UNDP	United Nations Development Programme
USAID	Village Infrastructure Project (Projects I and II, Indonesia)
VLSS	Vietnam Living Standards Survey
VND	Vietnam Dong

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DO RURAL INFRASTRUCTURE INVESTMENTS BENEFIT THE POOR?

I. INTRODUCTION

1. Over the past fifty years, significant investments in rural infrastructure improvements have been realized with diverse intended objectives, and varied levels of success in achieving these objectives. In terms of physical infrastructure, one goal has simply been to enable rural areas improvements in water supply, roads, energy sources, irrigation, etc. to address obvious disparities in levels of development between urban and rural areas. Many of the more recent rural infrastructure projects explicitly state welfare improvements of the rural poor as project objectives. It is generally accepted that physical improvements lead to economic, non-economic, and social benefits for the poor.

2. What is the evidence on linkages between rural infrastructure investments and household welfare? In the past, most completion evaluations of projects have focused on physical outputs (e.g. number of health care centers constructed, number of kilometers of roads rehabilitated) and quality of project implementation (e.g. the level of satisfying technical specifications within specified budgets or timeliness of implementation) to assess the efficacy of a project. The Operations Evaluation Department (OED) of the World Bank, for example, has given significant attention to these areas, to identify lessons learned for future project design. In recent years, greater attention has also been given to investment impacts. Of specific importance is to consider the impacts of investments on the poor (as opposed to the non-poor, those above the poverty line) both in economic and non-economic/social terms. One reason this is important is to prevent, or at least moderate, marginalization of the poor from investment-related welfare improvements for current and future projects.

3. Work for this paper was motivated by a desire to synthesize impacts observed from rural infrastructure interventions, to try to capture a broad, albeit far from comprehensive, picture of the manner in which investments are benefiting or not benefiting the poor. This broad picture could then serve to assist governments, donors, and other stakeholders by drawing attention to key ideas, by affecting project design, or by guiding project selection decision-making. A survey of past and current evaluations in the sub-sectors of rural roads and transport, water supply and sanitation, energy, and irrigation was conducted and key ideas from the existing literature are presented here.

4. Sources for the literature review included the World Bank Poverty Reduction Strategy Paper (hereafter, PRSP) Sourcebook, the World Development Report 1994: Infrastructure for Development, World Bank Working Papers, Operations Evaluation Department (hereafter, OED) publications, academic and on-line publications, and publications available at the Vietnam Development Information Center (a reference center in Hanoi on development activities in Vietnam and the Southeast Asia region, financed by the Governments of Australia, Canada, Denmark, Japan, UNDP, and the World Bank Group).[1]

[1] N.B. Given the extensive use of World Bank and OED publications, in most cases full report titles are cited for greater clarity. Some internal documents used as references may not be publicly available. Writing this paper in Vietnam enabled facility in carrying out the field work and linking such work to the literature review. However, a

5. In brief, though evidence does exist for improved household welfare from rural infrastructure investments, relatively little evidence was found of studies that provided concrete linkages between specific investments in rural infrastructure and increased welfare of the rural poor. This is due in large part to the complexity and oftentimes, the concurrent nature of interventions that make attributing welfare improvements to a particular project or program virtually impossible. Several authors discussed innovative methods for assessing impact, and proposed ideas and frameworks for future evaluations and studies (see Foster, 2000, for one example). A common theme in the literature was the need for inclusion of impact evaluations within the project design, and follow-through in carrying out these evaluations (see OED, 1994, for one example).

6. The literature survey was augmented by fieldwork in two provinces of the Central Highlands region of Vietnam (see Annex 11 for map). The fieldwork consisted of household interviews with the rural poor in areas receiving rural road improvements as well as interviews in unimproved areas. It examined, on a small-scale, the benefits of rural road interventions as perceived by the poor. The fieldwork did not intend to provide findings generalizable to a larger population, nor concrete policy recommendations. Rather, it allowed for cross-checking between observed impacts in the literature and the experience of the poor in particular villages in Vietnam. Cases from Vietnam pepper the main paper and show that experiences of the poor in Vietnam are strikingly similar to the poor in other countries. Annexes to the main paper describe the fieldwork in greater detail.

7. This three-part paper provides the evidence, such as exists[2], on observed linkages between rural infrastructure investments and household welfare of the rural poor. Part I discusses some past and current attempts to assess the impact of rural infrastructure projects, using the example of the sub-sector of rural electrification. Suggestions proposed in the literature for the structure of future evaluations will be given. These suggestions will also be in the sub-sector of rural electrification; yet have themes relevant for evaluations of different sub-sectors). Part II discusses the economic impact of rural infrastructure investments on the poor. These will be broken down by impact, of which there are six highlighted; as well as non-economic/social impacts on the poor, discussed by sub-sector. Finally, in Part III, the paper will discuss lessons learned from the literature on how to maximize the impact of rural infrastructure interventions on household welfare. Lessons learned will be discussed by themes. Again, in all sections specific project and/or country examples from the literature as well as data from the Vietnam fieldwork, will be presented as evidence for and illustration of key ideas and issues.

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real constraint was the limited access to off-line publications (vs. online publications), in particular, highly relevant books that were not available in Vietnam. These constraints naturally affect the final content of this paper.

[2] N.B. qualifying remark in Footnote 1.

II. ASSESSING IMPACT

A. The Example of Rural Electrification

8. Benefits attributed to improvements in rural infrastructure are often cited as the rationale for more investment in this sector. Rural water supply and sanitation projects are said to bring about health gains, and rural road rehabilitation to result in increases in household disposable income, e.g. through lower transportation costs. However, a closer look at impact evaluations reveals that little evidence exists on concrete linkages between specific interventions and improved welfare of the rural poor.

9. Part I describes some impacts and linkages that have been observed from particular rural infrastructure projects. It begins with examples from the sub-sector of rural electrification (RE). Next, it presents suggestions from the literature review for improving impact assessments, also in regard to rural electrification. Finally, two types of impact assessments of rural roads interventions in Vietnam are highlighted as examples of potential options for future evaluations.

Box 1: Should Rural Electrification Projects be a Given?

Limited government budgets obviously prevent comprehensive funding of investments in all essential areas to raise the welfare of the poor. Tradeoffs are inevitable. Beneficiary- or government-driven decision-making can often result in high priority given to rural electrification projects, which may then take precedence over road, irrigation, or sanitation projects. At the risk of belaboring a basic point, it is essential to acknowledge that investments in rural electrification imply lower funding for construction or improvement of other services that, depending on the case, may be more strongly linked to improvements in household welfare. Does electrification merit the relatively high levels of funding it is often allocated in terms of its impact on poverty reduction and improving the welfare of the rural poor?

In efforts to evaluate the real benefits from rural electrification (RE) projects, the Operations Evaluation Department of the World Bank (OED) found that due to the scarcity or poor collection of data, and the dearth of reliable evaluations on the impact of RE projects, little hard evidence exists for strong linkages between rural electrification and increased economic growth, *except when initial conditions already provide support for continued growth* (as through increased agricultural productivity) and *other complementary services exist* or are provided to support RE initiatives. Though benefits have long been attributed to rural electrification, closer examination of this issue is merited. One goal would be to avoid paying high costs for low benefits.

Source: Rural Electrification: A Hard Look at Costs and Benefits, Précis No. 90, OED, 1995.

10. To avoid misallocation or wastage of limited resources, more focused examination of the linkages is necessary, potentially through the use of new indicators and evaluation frameworks. The previously cited OED report noted the importance of including *less easily quantified benefits* of RE in project appraisal and project impact assessments. Electrification projects may show low economic return but may in fact have a high impact on other aspects of the welfare of the rural poor. For example the empowerment of women might be an impact from rural electrification initiatives, which in turn is likely to have a multiplier effect on families and the larger community. Debate and uncertainty exists on how to quantify or value non-economic returns. The report warned that caution should be taken in linking benefits to RE projects without thorough consideration of pre-intervention conditions, reverse causation, and other potential confounds.

11. This is not to say that no evidence exists for pro-poor benefits of rural electrification. A 1994 OED report discussed Bank experience in RE projects in Asia and observed the following beneficial impacts:[3]

- In India, the use of electric pumps in well irrigation was promoted in place of diesel pumps and led to increased agricultural productivity through *greater land use*, *decreased reliance on rainfall*, and *a move to higher-yield crops*. Diesel pumps continued to be used to supplement electric pumps; yet the new energy source was cited as the likely catalyst for the farmers' move to *more productive irrigated farming*.
- In India and Bangladesh, advances in irrigation due to RE were shown to significantly reduce the incidence of absolute poverty.
- In all studies, beneficiaries *perceived* benefits and improvement in their lives from rural electrification. These included a sense of being included in the country's development process, and having increased recreational opportunities and greater security due to lighting. Given that the poor often feel marginalized and their lives can be characterized by a sense of powerlessness and instability, even the perception of benefits can assist in empowering the poor, which is likely to lead to proactive initiatives by the poor themselves. In practical terms, reliable access to electricity for productive purposes is likely to help limit the poor's vulnerability to shocks (e.g. climate changes).

12. Negative or neutral impacts were also observed:

- In several countries, *RE had little or no impact on agricultural productivity.*[4] Constraints to villagers' benefiting from RE included prohibitively expensive connection costs (potentially due to unsubsidized start-up costs or lack of access to credit for start-up); unclear land use rights; extremely low income levels; limited access to capital or credit; and/or existing agricultural patterns or low potential for irrigation improvements.
- RE was found to have only a *modest impact on commercial and industrial productivity* in most cases. The OED review noted no observed cases of sharp increases in economic activity or establishment of new businesses after RE implementation. In Indonesia and Colombia, *less than half the business owners interviewed perceived an increase in profits due to electrification.* However, there is evidence that supports the positive impact of RE on long-term economic growth.
- *Less than 5% of villagers surveyed noted the use of light for productive purposes such as chores, handicraft production, etc.* The benefits of electricity for certain productive uses may be overestimated. More respondents (home and small business owners) noted the *value of lighting for security purposes* which in itself can certainly have economic value.
- In Indonesia, even where connectivity was an option, subsidies were provided for start-up costs, and electricity efficiency was superior to other options (e.g. kerosene lanterns), many households did not connect. This may indicate insufficient credit opportunities or

[3] Countries in the review and their primary investment areas were: a) Bangladesh and the Philippines – regional energy cooperatives; b) Malaysia and Thailand – countrywide rural electrification; c) Indonesia – household consumption; and d) India and China – electrification for irrigation. *Source: Rural Electrification in Asia – A Review of Bank Experience*, OED, 1994.

[4] These countries were the Philippines, Indonesia, Colombia, Ecuador, Bolivia, and Costa Rica.

be explained by extremely low incomes preventing the poorest from benefiting from RE investments.

13. For the past three decades, the Government of Bangladesh has worked with multilateral, bilateral, NGO, and private sector partners to address the issue of extremely limited access to electricity in rural areas. Since grid access is not cost-effective in many areas, the Government of Bangladesh has not only expanded grids where appropriate, but also promoted the development of mini-grids owned and operated by the private sector, NGOs, or local community organizations, as well as alternative energy sources for communities including solar, hydro, and wind energy generation sources. A U.S. Agency for International Development (USAID) evaluation of the Third Rural Electrification Project (co-financed by the World Bank and USAID) looked at the impact of electrification initiatives in Bangladesh.

Box 2: Benefits of Rural Electrification in Bangladesh

A USAID evaluation described the following **benefits** from rural electrification interventions:

- *Increased income.* Households with access to electricity because of the project had income 50% greater than households in control areas, of which 22% has been attributed to electrification.
- *Lower rate of poverty*. The rate of poverty was 34% in project areas, versus a rate of 41% in control areas. The gap between the richest and the poorest households in project areas remained the same; however, the income of the poorest of the poor (lowest 10% income group) in affected areas was higher that income of the poorest in control areas.[5]
- *Increased agricultural productivity.* Beneficiaries felt the greatest economic impact resulted from the electrification of irrigation, which enabled greater land use for agricultural purposes and acted as a catalyst for more modern agricultural practices. Most farmers switched from diesel to electric pumps.
- *Increased off-farm income.* Electrified households had off-farm income 33% higher than control villages and 66% higher than non-electrified households in villages with access to electricity.[6]
- *Increased savings.* Electrified households were able to save 30% more money than control households and have better access to credit, enabling a 'virtuous cycle'.
- *Increased hours and rate of commercial activities.* Working hours increased from 9 to 14 hours per day; turnover increased by 34%. Electrified businesses employ more workers and pay higher wages than non-electrified businesses, showing that access to electricity by a particular household has the potential to have a multiplier effect.[7]

Sources: USAID in Bangladesh website, http://www.usaid.gov/bd/Economic_Growth.html; *Bangladesh – Second Rural Electrification Project*, Project Completion Report, World Bank, 1995; *Bangladesh – Third Rural Electrification Project*, Implementation Completion Report, World Bank, *2000; Bangladesh – Rural Electrification and Renewable Energy Development*, Project Information Document, World Bank, 2001.

[5] A recent review by OED of energy sector projects in Asia cautions against hastily determining causation from correlation in terms of household well-being. In many cases it may be unclear whether villages selected to gain access to electricity are generally start off 'better off' and have higher initial income (OED, 1994).

[6] Footnote 4 and the need to question which condition came first also apply here.

[7] **Quantifiable benefits** observed after 30 years of Government of Bangladesh collaboration with multilateral and bilateral agencies, and other partners in rural electrification initiatives were the following: 61 rural electrification cooperatives established, 6 more in development; 121,000 km of electrical line installed; 3.14 million metered connections installed (servicing over 20 million people); electricity provided to 30,400+ villages; almost US $100 million billed and collected annually from consumers; US $1 billion+ invested in rural electrification in Bangladesh to date (Government and donor funds); system loss for the rural electrification program at approx. 16%, versus 30-35% for the national utility; 10,000 direct jobs and 30,000+ additional jobs created for electricians and manufacturers of electric components.

14. Thus, the literature presents evidence for pro-poor benefits, and also points to some neutral and negative or unintended impacts of rural infrastructure investments. In any case, the dearth of evidence on direct linkages is clear. Examples provided here of RE project impacts typify the general situation where relatively limited evidence exists on concrete linkages. It is the opinion of the author that benefits are likely to result from investments; yet the literature and the author alike argue that a commitment to pro-poor impact evaluations is essential in order to formulate better project design targeting the rural poor, determine the most effective and appropriate investment allocations for a given objective, and reduce waste of public funds. Rural electrification projects, among other rural infrastructure investments, obviously necessitate significant attention to costs and real benefits, opportunities for cost-recovery, financial support for initial years, future sustainability and likely benefits foregone from other projects not funded.[8] The challenge lies in carrying out the exercise and covering new ground in evaluation efforts.

B. Options for Future Impact Evaluations

15. **Suggestions from the Literature Review:** An OED review of rural electrification projects in Asia supported by the World Bank noted the need to incorporate monitoring and evaluation as a key component of the project design.[9] Researchers have proposed innovative means of assessing economic and non-economic benefits as well as improvements in fulfilling basic needs, and have proposed considering RE from new angles. For example, assessing the amount of electricity used has greater descriptive value regarding user consumption patterns than simply the number of households connected. Appropriate designs for energy investments should seek to include impact monitors through the use of easily collected data and in a manner allowing for standardization of analysis across countries and over time.[10]

16. **Assessment indicators** can include the following:

- Beyond a simple assessment of how many households have the option to access electricity, it may be valuable to consider *what* energy sources the poor can choose from and *at what cost.* Electrification helps in pulling households out of poverty; yet making low-cost improved energy sources (e.g. kerosene, LPG) available to the poor can also improve household welfare and minimize health risks resulting from the use of other energy sources.
- Reliability of households' energy sources can be measured by the *percentage of time on average that a household has access* to different energy sources. Reliable access permits

[8] A long-held view has been that rural electrification investments are only justified if, following the initial start-up years, consumption reaches a satisfactory level of consumption at an economic price to enable an acceptable level of economic return. This view continues to be supported by the review of recent projects. Support in the form of subsidies for operational costs are no longer advised as a sustainable or appropriate means of enabling access to electricity in rural areas. Cost-recovery mechanisms based on realistic estimates of future consumption are critical to sound project design and future sustainability. Thus, it is essential that project appraisals include sufficient attention to forecasts of future consumption based on user demand, intended uses of electricity, and potential need for future expansion of service.

[9] See Foster, 2000 for a discussion of impact measurement, including a description of indicators relating to basic needs, monetary, and non-monetary benefits.

[10] *Sources*: *Measuring the Impact of Energy Reform – Practical Options*, Foster, 2000; *Impact of Power Sector Reform on the Poor – A Review of Issues and the Literature*, ESMAP Technical Paper, 2000; PRSP, 2001.

households to use energy for productive purposes and livelihood opportunities in a more consistent manner.

- Instead of simply looking at the household's share of income devoted to energy expenditures (the explanation for which is open to misinterpretation), the use of a *subsistence threshold* may be more appropriate. This would be a measure of whether a household has the income necessary to have access to a sufficient level of energy to fulfill basic needs. Foster (2000) recommends this be quantified in per capita terms to control for household size.
- In regard to non-monetary benefits, one indicator could be to assess any decrease in an individual's *number of hours of exposure to indoor air pollutants.*

17. When possible, assessments should be characterized by the following:

- Pre- and post-intervention assessments
- Assessments of impact areas and control areas
- Collection of information on income and consumption and energy-related behavior

18. Foster (2000) distinguishes between impacts on the *welfare of the poor* as opposed to the impact on *poverty.* An example of the former would be pricing reform such that the cost of electricity is less for poor groups;[11] an example of the latter would be increased household productivity due to access to electricity, enabling higher income, greater purchasing power, and potentially, escape from poverty. Nonetheless, energy interventions[12] (independently, or more likely in the context of a more comprehensive strategy targeting areas such as health and education) that have impact in either or both areas will undoubtedly support the overall objective of development for poverty reduction.

19. Beyond the use of appropriate indicators, it is essential to ensure a commitment to impact evaluations. The aforementioned OED review observed that monitoring of rural electrification projects beyond assessments of completed construction and physical indicators was limited and characterized by little follow-through of evaluations proposed in initial project stages. A true understanding of the linkages between rural electrification and pro-poor impacts is hindered by limited data, questionable data collection and analysis, and evaluations that are not comparable across countries.[13]

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[11] Effective targeting of the poor is a timeless challenge. Various attempts to subsidize costs for the poor (e.g. electricity usage subsidies or subsidized prices for kerosene) have most often been found to benefit the non-poor at the expense of the poor. Negative consequences of ineffective subsidies include limited access to electricity or higher prices for non-subsidized energy sources that may be a poor household's only energy option. Possible successful ways of targeting the poor have included maintaining prices at market rates (particularly given the evidence supporting the poor's willingness to pay full price for improved energy sources) enabling greater reach of services; subsidizing initial connection costs; subsidizing or otherwise providing incentives for private investment in rural energy initiatives (given the higher cost or potential cost-'un-recovery' inherent in rural energy schemes); or turning to alternative energy sources such as solar or hydro-generators.

[12] Foster (2000) identifies interventions in the energy sectors such as restructuring, privatization, and liberalization of state-owned energy providers, as well as domestic policies affecting energy prices.

[13] *Source: Rural Electrification in Asia – A Review of Bank Experience,* OED, 1994.

Examples from Vietnam: Large- and Small-Scale Evaluations of the Impact of Rural Road Improvements

20. The Public Economics, Development Research Group of the World Bank supports research on the impacts of rural infrastructure investments on the poor. One economist, Dominique van de Walle, has considered this issue in the country of Vietnam.

Box 3: Large-scale Evaluations of Poverty Reduction Impacts in Vietnam

In a current study considering the impact of rural roads in Vietnam, van de Walle is using household survey data collected in 1997 and 1999 as part of a World Bank-supported Living Standards Survey to assess whether benefits have been realized by the rural poor in areas such as agricultural yields, income diversification, employment opportunities, and land use and distribution. The data is comprised of two sets of surveys from 100 project communes and 100 nonproject communes, enabling van de Walle to look at outcome indicators including those mentioned above through models on project site selection, and models on commune-level gains (dependent on commune selection for investment as a project site). This large-scale quantitative study will advance knowledge in regard to whether investments in rural roads are pro-poor as seen in the case of Vietnam. This study follows van de Walle's other work on processes for selecting rural road investments in Vietnam to reduce poverty, and research on interactions between investments in human capital and physical capital. van de Walle's efforts provide examples of large-scale impact evaluations using quantitative models for the country of Vietnam, with relevance and implications for other countries at a similar stage of development.

Sources: Online descriptions of van de Walle research, 2001. Available at http://econ.worldbank.org/view.php?type=20&id=1493 (Rural Roads Welfare Impact Evaluation), http://econ.worldbank.org/view.php?type=5&id=1213 (rural road investments), and http://econ.worldbank.org/view.php?type=5&id=1180 (human and physical capital interactions).

21. The field work conducted to augment this literature survey was a small-scale collection of voices of the poor, through household interviews. It stands in sharp contrast to the aforementioned evaluation method.

Box 4: Household Interviews with the Rural Poor in Vietnam

Over the course of 5 days, interviews were carried out with households benefiting from project investment in rural road rehabilitation as well as households in unimproved sites. Interviews began with the collection of general household information, which was then used as baseline data (see Annexes 5 & 6). The main component of the interview was comprised of a series of open-ended questions (see Annexes 7 & 8). The data was then analyzed through qualitative methods. Findings, though not generalizable to a larger population, are important in that they can be used to complement findings from quantitative studies, such as by providing a human face to economic explanations and descriptions more accessible to a non-quantitatively trained audience. In the case of Vietnam, the results of this field visit will be incorporated into the project implementation completion report of the Rural Transport I Project supported by the World Bank. The field report can be found at the end of the main report (Annex 4). In brief, findings in Vietnam mirrored those culled from the literature survey. For example, the poor seemed to benefit less than the non-poor in rural areas. More findings are presented in the field report (Annex 4).

Source: Field data, Central Highlands, Vietnam, 2001.

22. The aforementioned studies show different methods for examining impact. They vary in terms of cost to implement, degree of generalizability and reliability, and objective for study implementation. The last area is of particular importance when considering how to evaluate

impacts. In some cases, a lower cost, albeit less comprehensive, method may provide the data and findings sought.

III. ECONOMIC AND SOCIAL IMPACTS

A. Economic Impact

23. A key objective of rural infrastructure investments is to raise the economic status of the rural poor through increased income and improved consumption patterns (which can be demonstrated in lower costs for basic goods, lower expenditure on energy due to use of new energy sources, greater use of social services, etc.). On one hand, the unfortunate reality is that the evidence supports greater benefit of rural investments to the non-poor, whereas the poor benefit disproportionately or (in some cases) not at all. There can be disparity in benefit across socio-economic groups, across villages or regions, or within a village. On the other hand, cognizance of this reality has led to changes in project design with greater attention to effective targeting of the poor (e.g. through revised subsidy schemes for rural electrification). Additionally, evidence exists where the poor do experience economic benefit. The case of rural electrification initiatives in Bangladesh highlighted in Part I gave some examples. Part II will discuss some benefits from rural infrastructure in greater detail with supporting examples from other countries and sub-sectors.

24. The poor can benefit from *higher incomes from pre-existing (pre-intervention) livelihood opportunities*, e.g. through higher productivity or lower cost for agricultural activities.

25. In Morocco, a highway project supported by the World Bank included a rural road rehabilitation component. An OED evaluation noted the following productivity improvements and economic benefits:

- Land use for fruit and vegetable crops increased 40%, and small farms' use of agricultural extension services increased fourfold.
- Agricultural diversification to high-value crops (e.g. as perishability was no longer a constraint), complementary components of the project (e.g. irrigation equipment and improved seeds), and increased investments in livestock raised farmers' productivity and incomes.
- Off-farm employment opportunities were created at a factor of 6.

26. These advances are particularly striking when compared with observations in control areas. Control areas were characterized by production of lower-value cereal crops and little change in farming technologies, and off-farm employment increased by only a factor of 3 over the 10-year study period.[14]

27. An OED evaluation of World Bank supported rural road rehabilitation in Ghana, found that rural sellers profited from higher prices, as they were now able to sell their goods directly rather than through middlemen. Shopkeepers noted that bringing goods to the village was less expensive and their sales had risen.[15]

[14] *Sources*: *Morocco – Socioeconomic Influence of Rural Roads: Fourth Highway Project*, OED Evaluation Report, 1996; *Précis* No. 119.
[15] *Source: Précis*/OED, No. 199, Winter 1999.

28. Infrastructure projects also raise income through *new or increased employment opportunities*, including jobs directly created by the project.

Box 5. Village Infrastructure Projects in Indonesia

Two Village Infrastructure Projects (VIP and VIP2) involving loans of US $72.5 million and US $140.1 million, respectively, demonstrated remarkable success in constructing and rehabilitating rural infrastructure and in empowering project beneficiaries. Both projects were noteworthy for their ability to enable village-level planning, decision-making, and action, with overall management by the central government.

In **VIP**, selected villages[16] were given a one-time grant equivalent to US $54,000[17] to use towards rural infrastructure activities. Five sub-sectors were presented as possible areas for investment to assist beneficiaries in discussion and decision-making: rural roads, bridges, drinking water, communal sanitation units, and piers. Ultimately, 1230 villages received a grant (more than the appraised 1200), resulting in the construction of rural roads, bridges, water systems, communal sanitation units, and piers, in the space of two years:[18]

Rural roads were the most popular investment (80% of grants paid for rural road investments), underscoring access as beneficiaries' number one priority in these villages. Drinking water systems were a priority once roads were available, followed by sanitation systems. The exact reasons for this prioritization, however, are unclear.

As impressive, jobs were created for un-/underemployed villagers (through equal opportunity terms) and were in demand, through a self-targeting mechanism whereby below-minimum wages were offered.[19] To satisfy the demand, a rotational system of employment was used. Women's participation was limited (approx. 9% of total laborers), women likely still benefited through increased household income. Jobs were also created and new opportunities emerged as a result of the new rural infrastructure.

Benefits to villagers included the following: lower transport costs, increased production or a move to higher-value crops, increased school attendance and use of health care facilities, and access to clean drinking water and resulting health improvements.

***Sources: Village Infrastructure Project* and *Second Village Infrastructure Project/Indonesia,* Implementation Completion Reports, 1999 and 2000.**

29. The rural poor can benefit *directly* as beneficiaries of the projects (e.g. higher agricultural productivity) or *indirectly* (e.g. time savings or lower costs for goods and services).

30. A mid-term evaluation of an International Fund for Agricultural Development (IFAD, a United Nations agency) rural irrigation project in Northern Thailand noted that beneficiaries saw a 26% rise in household income from the construction and rehabilitation of small dams, weirs, and canals. Farmers surveyed felt the project impact was clearly positive, as they would be able to increase productivity through land use during the dry season.[20] An OED sector study on

[16] Villages selected from a pool of villages in the poorest third of districts in Java; the majority of selected villages were rural.

[17] US $54,000 was the average grant amount. Grants disbursed were of three fixed amounts proportional to village size (small, medium, large), to promote transparency.

[18] Each village completed their portion of the project within one year.

[19] N.B. that jobs were given to *local villagers,* and not short-term laborers from outside the community.

[20] The project investment for the initial phase of the Northern Thailand irrigation project was US $18.3 million, comprised of loans (US $15.3 million) and the government contribution ($5.3 million, of which $2.3 million was the estimated in-kind beneficiary contribution). It should be noted that the beneficiaries were responsible for very little of the project costs. *Source: Thailand – Agricultural Diversification and People's Irrigation Project in the North* – Mid-Term Evaluation Executive Summary, Online document, http://www.ifad.org.

irrigation projects recognized that the promotion of higher value crops, increased agricultural productivity, higher demand for labor, and greater opportunity for income-generating opportunities directly served to improve the welfare of rural communities.[21]

31. Indirect economic benefits of rural water projects observed that households had more disposable income or higher earnings due to increased time for income-generating opportunities due to time savings from close access to water (e.g. in Paraguay) as well as decreased expenses on health care (medicine and doctors visits) resulting from better health practices made possible by rural water projects.[22] Beneficiaries in Sri Lanka noted timesavings of up to 30 hours per month; those in Karnataka, India, noted an average of 90 hours saved per month. These timesavings, if quantified in terms of the average wage value of a laborer's time, would represent large increases to household income. Increased densification of villages was observed in Kerala and Paraguay, with implications for a potential increase in opportunities for development assistance, modernization, and strengthening of the local economy.[23] A final point related to economic impacts from rural water supply and sanitation is that poverty does not necessarily impede sanitation improvement. A recent UNICEF report noted that the low-GNP countries of Kenya and Tanzania have achieved widespread access to sanitation.[24]

32. Investments can and often do result in *lower cost for goods and services* consumed. Beneficiaries of rural road rehabilitation projects in Kon Tum and Dac Lac Provinces in the Central Highlands region of Vietnam noted that the cost of goods in their village decreased to the same price as goods sold in the commune center following the upgrading of roads to year-round access gravel or asphalt roads.[25] Following a rural water supply project in Paraguay, households had more disposable income with no change in earnings due to lower cost water. Poor households who formerly purchased water from vendors (this expense represented 12% of household income) spent only 4% of their household income on greater quantities of safe water as a result of the project.[26] In Kerala, India, land values increased by five times following rural water supply improvements.[27]

33. However, in order to allow the rural poor to achieve these benefits, it is critical to *remove or minimize obstacles* and *create a supportive environment* for rural economic growth. For example, in rural electrification, obstacles can include high connection costs, limited or no access to credit, or loan terms that dissuade the poor from borrowing. Limited skills may prevent villagers from maximizing the benefits of electrification, pointing to the value of relevant skills training.[28]

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[21] *Source: The World Bank and Irrigation*, OED Sector Study No. 14908, 1995.

[22] What is unclear, however, is the extent to which employment or income-generating opportunities (beyond increased agricultural activity) were available to enable beneficiaries to capitalize on this available time.

[23] The sector review also found that indirect economic benefits of rural water projects to the rural poor were more considerable and widespread than the direct economic benefits. *Source*: *Rural Water Projects – Lessons from OED Evaluations*, OED Working Paper No. 3, 2000.

[24] *Source*: *Sanitation for All – Promoting Dignity and Human Rights*/UNICEF, 2000.

[25] In Vietnam, a group of villages comprise a commune, a group of communes comprise a district, and a group of districts, a province. In rural areas, the commune center is where the majority of services are concentrated: e.g. telephone and postal services, the secondary school and health care center.

[26] Water vendors, in turn, saw decreased income following the introduction of public community pumps.

[27] *Source: Rural Water Projects – Lessons from OED Evaluations,* OED Working Paper, 2000.

[28] Though perhaps a low priority compared to improvements in fulfilling basic needs, computer-skills training may be of value to minimize the widening technology gap, and these skills may in turn be used to facilitate information exchange. See *Readiness for the Networked World: A Guide for Developing Countries,*

34. A supportive environment for rural growth should build on the assets and capacities of the poor. Cottage industries or small business initiatives may have limited benefit for the poor, particularly if goods produced face low demand or a saturated market for the same or substitute goods. Micro-enterprise advisory services and pro-poor credit opportunities can promote off-farm employment and diversified production into more profitable areas.[29]

35. Income of the rural poor can be stimulated through *new business initiatives* resulting from the project, as seen in rural water supply projects. In some project areas, a very small proportion (0.9-1.7% of households surveyed, depending on project area) of the project beneficiaries started *new enterprises* as a result of the access to water. Restaurants and laundries were opened, agriculture and animal husbandry activities were initiated, and alcoholic and non-alcoholic beverages were made and sold.[30] Again, complementary initiatives such as small business training and advising and access to credit may enhance the economic benefits resulting from water projects and enable a greater percentage of households to participate in these initiatives.

B. Non-Economic and Social Impacts

36. Project evaluators appreciate that measures such as cost-benefit analyses of economic return on investment neglect to consider other less easily quantified benefits; and thus viewed in and of themselves fail to provide the most comprehensive picture for both pre-investment decision-making, as well as project impact evaluation, immediately following completion or some years out. As noted earlier there is now greater attention to non-economic and social impacts of rural infrastructure in investment selection, project appraisal, and project evaluation. Part I provided some examples of innovative indices and assessment characteristics for these less traditional types of evaluation. This section discusses some of the findings in the literature regarding non-economic/social impact, through examples from the sub-sectors of rural road rehabilitation and transport, electrification, solar energy, irrigation, and water supply and sanitation interventions in rural areas.

Rural Road Rehabilitation and Transport

37. In Morocco, benefits from rural road improvements were found in the areas of health, education, and gender, as well as improved mobility due to increased public transportation services and greater household purchases of motorized means of transportation in comparison to control areas.

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www.cid.harvard.edu/cidspecialreports/ for more on the role of Information and Communication Technology (ICT) in a country's development and country preparedness for ICT. See *Business Services for Small Enterprises in Asia: Developing Markets and Measuring Performance* at http://www.ilo.org/public/english/employment/ent/papers/grameen.htm for a country example of the use of the Grameen Village Phone in Bangladesh for market development in rural areas.

[29] *Source*: *Rural Electrification in Asia – A Review of Bank Experience*, OED, 1994.

[30] *Source*: *Rural Water Projects – Lessons from OED Evaluations*, OED Working Paper No. 3, 2000.

Box 6: Rural Road Improvements in Morocco: Impacts

Seventy percent of the poor in Morocco live in rural areas, and the government has been committed to investments in this area. A component of the World Bank supported Fourth Highway Project in Morocco focused on paving and upgrading poor quality sections of the rural road network. A 1995 study by OED that observed positive impacts of these investments for the rural poor in several areas included the following:

Health

- Previously understaffed health care facilities were able to attract health care personnel, as improved roads made these locations easily accessible. Concurrent government campaigns to staff local health care centers with doctors supported this initiative.
- Facilities were improved, in part due to the improved roads, and increased medicine stock was available as transportation became easier and cheaper.
- Health care facilities registered significant increases in outpatient visits.
- Villagers noted improved diets. Improved roads made fish, vegetables, and fruit more affordable and enabled speedier transport of perishable goods.

Education

- Girls' enrollment increased more than threefold; however, it is difficult to directly link this impact with road improvement, as many of the schools were upgraded at the same time. However, the study does notes that many facilities were improved in part *because* of the improved roads.
- Absenteeism of both teachers and students decreased.

Gender

- Cost of butane decreased, allowing more households to use this energy source and resulting in significant timesavings for women.
- Women had access to more livelihood opportunities and consequently increased their participation in the formal economy.[31] For example, women worked in new cooperatives that developed due to the paved roads and received a share of the profits.
- Maternal and childcare programs were expanded or made available due to the improved roads.

Other notable findings

- A new, frequent (fleet of 40, with several passing a given point per hour) and low-cost form of transport, share-ride taxis, developed along with road improvement, a significant improvement from rural buses operating once daily; Ownership of motorized vehicles increased by a factor of 3.
- Household expenditures on transport increased substantially more in control areas than in project areas, and were not due to higher quality of service in the former (with higher shipping and vehicle operating costs in control areas).
- Roads were upgraded from gravel to paved, enabling year-round access. Many of the benefits noted were largely due to the type of road. However, the study noted some concern that pavement may not have been the optimal choice, since road maintenance has been a weak area in Morocco and paved road investments are less easily sustained.

Sources: Morocco – Socioeconomic Influence of Rural Roads: Fourth Highway Project, OED Impact Evaluation Report, 1996; *Précis* No. 119, OED, 1996.

[31] Women have typically low participation in the formal economy in Morocco.

38. The Morocco example highlighted above shows possible benefits that may result from rural road investments. When selecting the type of infrastructure and the level of investment appropriate for a particular site, country- and site-specific conditions and the tradeoff between likely benefits from different types of infrastructure are critical factors to consider. Caution is necessary to prevent rationalizing an investment selection largely based on apparent successes in other countries, countries that may be characterized by very different conditions.

39. A related issue in regard to the impact of rural road and other rural infrastructure investments is that of resettlement, in the cases where resettlement is unavoidable or the best-choice option. Often, projects do not address potential negative consequences from resettlement (e.g. through loss of livelihood opportunities) or provide compensation in any form to affected parties (e.g. resettled parties, or those losing land to road improvements). A staff member of a provincial project management unit for rural infrastructure activities in Vietnam noted that differences existed in compensation policies between projects funded only (or primarily) by the Government and projects funded with World Bank support. The intent here is not to identify those policies and projects that fall short of ideal compensation measures, but to suggest greater attention to minimizing negative consequences (e.g. through safeguards) and incorporating appropriate compensation to affected parties in the design of all projects for greater consistency. Fortunately, following a greater realization of the potential for negative consequences, donor-financed rural infrastructure projects typically do demonstrate a commitment to minimizing negative project impacts and providing compensation to affected parties.

40. A country example of rural transport projects in Ghana illustrates benefits in regard to mobility, capacity building, and physical infrastructure.

41. In Vietnam, the commune of Ea Quang received government, World Bank, and local community financial support for rural road upgrading. A husband and wife interviewed said they invested in the purchase of a truck using formal credit from the Bank for Agriculture and Rural Development (state-owned bank) following the rehabilitation and upgrading of their commune road from dirt to asphalt.[32] They were able to save close to 1 million VND (approx. US $68) last year on transportation costs related to their coffee farm (with likely increased efficiency of transport) by using their truck instead of renting a buffalo-pulled cart at 30,000 VND/trip (approx. US $2), with about 32 trips per year. This household, however, is a non-poor household based on the MOLISA poverty line.

42. Benefits from the road improvement identified by local authorities from this village included: year-round access, elimination of health hazards from dusty roads, improved mobility (e.g. children were able to go to and from school in the rainy season, whereas in the past they would often have to spend the night at the school in inclement weather), and an increase in household purchases of motorbikes. They also noted that rehabilitating the road had been a priority for the local people for many years but funding was the greatest constraint. The Rural Transport Project I supported by the World Bank and DFID provided financial support for rehabilitation of the road foundation, and financial contribution by the local people enabled the road to be upgraded to an asphalt road.

[32] Ea Quang – Vu Bon Road, in the District of Krong Bac, 11.6 km long. Road Code 09-06-04 of Rural Transport I. Works started on 9 November 1999 and completed on 28 June 2000. Cost/km was 238 million VND. Per observation, road was in good condition, bitumen layer on gravel foundation. Household cited in this paragraph was located on the improved road (Data from field visit, 2001).

43. However, investments in physical road improvements do not necessarily lead to increased availability or improvements in transportation services, through private (for household mobility or for entrepreneurial purposes) or public investment to provide such services. The above example suggests the importance of complementary inputs such as access to credit to maximize impact. This complementarity of inputs will be discussed further in Part III.

Box 7: Rural Transport Impacts in Ghana

A 1999 OED report on three transport projects in Ghana discussed intended pro-poor outcomes that had been achieved, and successes were noted at different levels: rural communities, capacity building, and physical infrastructure. The three projects were designed with the short- to medium-term goal of rehabilitation. Roads were in severely poor condition largely because of the lack of attention to the transport sector in the 1970's and '80's, a time of political instability in Ghana. The long-term goals focus more on road management and financing.

Design in Brief. The three consecutive projects lasted about 10 years, from 1987-1998 and included road rehabilitation, transport improvements, promotion of intermediate means of rural transport, railway equipment, and software components (e.g. training for staff of the Department of Feeder Roads (DFR) and provision of technical assistance). Intended objectives included promotion of the commercial management of roads and increasing efficiency of the transport sector. Pro-poor objectives included the promotion of low-cost technology for rural transport, reduced transport costs, and improvement of women's self-development (particularly in the design of the second project).

Impact on Rural Communities. Villagers' lives were affected positively following the implementation of the three projects. They noted these benefits:

- Greater access to motorized transport improved their mobility, both for personal and commercial travel, and was offered at a cheaper cost.
- Transport in times of health emergencies was cheaper and easier to use.
- Investments in feeder roads brought increased agricultural productivity to rural areas, greater market accessibility, and increased mobility of the rural poor.

Impact on Local Capacities. Government agencies benefited from increased learning and capacity, and local industries were developed and promoted. The Ghana Highway Authority and the DFR, key actors involved in the three projects on the side of the Ghanaian government, noted improved expenditure and work programs (e.g., the latter included road maintenance designs promoting women's employment) following collaboration with the World Bank on these projects. The design of the second project explicitly provided institutional support for local NGOs. Local consultancies and construction firms emerged to meet the demand for these services.

Impact on Physical Infrastructure. The projects were most successful in rehabilitating a portion of the rural roads in Ghana before it was 'too late'. However, an assessment in 1997, showed that 58% of the road network was still classified as in poor condition. The World Bank and the Ghanaian government have set targets for future investments in this sector: 70% of the network to be brought to 'good' standing, and 20% to be 'fair'. Railway investments were the only component of the projects that failed to meet intended objectives.

Source: Précis No. 199, OED, 1999.

C. Infrastructure Sub-Sectors

Rural Electrification

44. Rural electrification in Bangladesh has been found to provide the following benefits:[33]

- *Increased social benefits.* Most respondents noted benefits that included improved learning through longer study hours (2 hours more per day) and greater involvement by women in children's education. Literacy and school enrollment rates were significantly higher in electrified areas. Electrification of public offices (schools, offices, places of worship) has resulted in better service provision.
- *Increased participation by women.* Women (albeit of higher income groups) participated in managing Boards for the project. Specific project staff positions were reserved for women to promote their involvement.

45. In field research in one village of Hoa Binh Commune in Kon Tum Province, Vietnam, respondents felt their village was better off in recent years (despite a lack of targeted road improvements to the village) because of village electrification, as well as the provision of agricultural trainings and a new health care center.

Solar Energy

46. In certain rural areas, however, electrification is not a feasible or foreseeable option for rural energy initiatives. Solar energy is one example of an alternative that has provided pro-poor benefits.[34]

47. The World Bank reviewed the performance of recent photovoltaic electrification initiatives in the Dominican Republic, Indonesia, the Philippines, and Sri Lanka. This alternative option has proven to be an affordable, reliable, and appropriate system of providing low levels of energy to households in rural areas. It is of particular value in remote areas where the cost of providing grid access is cost-prohibitive, and expected consumption of smaller communities is low. There is large scope for NGO, private sector, and local community participation, ownership, and management of solar power enterprises; and involvement by these actors has proven successful in the past. It can serve as a complement to electrification initiatives, or substitute for grid extension to areas where the cost is not justified.

48. Countries that have incorporated this solar energy option into their rural energy strategy include China, Mexico, Kenya, Indonesia, Brazil, Sri Lanka, the Dominican Republic, and the United States (on Navajo reservations). Solar energy is typically used for welfare-enhancing purposes such as lighting, refrigeration, entertainment, and water purification, and can power light irrigation and telecommunications (Shepperd and Richard, 1993, in WTP No. 324, August 1996).

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[33] *Sources:* USAID in Bangladesh website, http://www.usaid.gov/bd/Economic_Growth.html; *Bangladesh – Second Rural Electrification Project, Project Completion Report,* World Bank, 1995; *Bangladesh – Third Rural Electrification Project*, Implementation Completion Report, World Bank, 2000; *Bangladesh – Rural Electrification and Renewable Energy Development*, Project Information Document, World Bank, 2001.

[34] Solar energy projects have their own constraints and are not appropriate possible for all target populations and areas. However, system advances make it a more appropriate option than it has been in the past.

49. Though electrification is preferable where local conditions are appropriate, solar energy has benefits over kerosene and rechargeable batteries, and uses beyond those afforded by unimproved energy options such as firewood or dung.

Box 8: Solar Energy in Rural Areas: Perceived Benefits

Rural consumers felt that solar energy:

- provides higher quality light;
- is safer – no risk of indoor air pollution, accidental fires or battery leakages;
- is more convenient and requires limited to no future purchases of equipment or fuel;
- is more reliable and is not dependent on access to fuel; and
- carries with it a sense of progress and higher social standing for beneficiaries.

Also, because of the traditional uses of solar energy given its limitations (low levels of power generated precluding its use for heavy industrial tasks), women and children may benefit the most. Women in the Dominican Republic and the Philippines were able to do housework in the evenings and spend their days outside the home in productive activities. Women in the Philippines did not have to spend as much time acquiring necessary fuels and consequently had more time to participate in income-generating cooperatives. Women also felt that solar electrification allowed them to provide better care for their children, particularly in responding to nighttime needs. Children appreciated the ability to read at night, listen to the radio, and watch television because of solar energy.

Source:*Best Practices for Photovoltaic Household Electrification Programs: Lessons from Experiences in Selected Countries,* World Bank Technical Paper No. 324, 1996.

50. Photovoltaic electrification poses significant constraints to attaining pro-poor goals. It has greater start-up costs for a community and a household. It is not the ideal option in many cases, particularly where grid access is economically viable, since the latter has clear benefits to solar power. However, advances of recent years have been reflected in lower costs, greater reliability, and observable benefits to households who may not otherwise have access to electrification. Appropriate complementary elements within an electrification project (e.g. consumer education to manage expectations and pro-poor financing options such as seed capital funds) can make it the least-cost, or even the best energy option for underserved rural areas.

Rural Irrigation

51. An OED sector study (1995) that reviewed completed, ongoing, and approved rural irrigation projects supported by the World Bank globally found that the poor generally benefited. Project evaluations provide evidence for the pro-poor benefits from the construction or rehabilitation of dams, canals, reservoirs, and other facilities for improved irrigation. At the same time, examples certainly exist where the rural poor are excluded from benefits (e.g. the landless poor) or benefit little from irrigation investments.

52. Non-economic and social benefits were found in the following areas:

- **Empowerment.** In Ecuador, most farmers are women. Women in the project areas benefited from training[35] and participation as project leaders and promoters. An

[35] The training methodology and activities effectively surmounted the challenges of widespread illiteracy and instruction regarding technical complexity of the works, and enabled effective communication between project engineers and beneficiaries.

evaluation of the project noted that, "[women's] names are included on the irrigation roster along with those of their husbands, fathers, and brothers. This new practice acknowledges their role as irrigators and allows them to earn rights on their own behalf and that of their families" (IWMI, 2000).[36]

- **Security/Decreased Vulnerability.** Households gained increased food security and strengthened their asset base through access to credit and productive use of that credit.
- **Accessibility.** In Bangladesh, project participants benefited from access to credit,[37] material, knowledge (increasing productivity) and promotion of marketing activities.[38]

Rural Water Supply and Sanitation

53. From the literature reviewed, non-economic and social benefits from rural water supply and sanitation seem to be clearer than those from other interventions. The UNICEF Sanitation for All report highlighted these benefits (economic and non-economic) from investment for improved sanitation:

- Lower rates of death and sickness
- Savings in health costs
- Higher worker productivity
- Better learning capacities of school children
- Increased school attendance, especially by girls
- Strengthened tourism
- Heightened personal dignity and national pride

54. However, methodological problems identified in past evaluations of the linkages between water supply and sanitation and improvements in household welfare are many. Blum and Feachem (1983; in Caincross, 1999) identified 8 common errors. When confounding factors are considered, the rate of diarrhea incidence reduction due to well-designed water projects is approximately as low as 25%. The impact of water projects, as opposed to the impact of other concurrent interventions or the interaction of all interventions in a given community, can of course never be fully isolated (Caincross, 1999; PRSP, 2001).

55. Additional benefits from rural water supply projects identified by an OED sector review were *greater security* (drought-prone communities in Mali gained year-round water access

[36] However, in Bangladesh, community empowerment did not result from a rural irrigation project, and community participation was limited, even though the project was generally successful in delivering economic benefits (*Grameen Deep Tubewell Irrigation Project – Project Evaluation Summary*, UNCDF, 1998). This outcome was felt to be a result of the project approach (top-down) and the selectivity of the project (focus on beneficiaries likely to succeed).

[37] The Grameen-style credit scheme achieved financial sustainability; yet there was scope for improved targeting of poor women, older women, female-headed households and other potentially marginalized groups.

[38] *Sources: The World Bank and Irrigation*, OED Sector Study No. 14908, 1995; *Thailand – Agricultural Diversification and People's Irrigation Project in the North* – Mid-Term Evaluation Executive Summary, Online document, http://www.ifad.org; *Grameen Deep Tubewell Irrigation Project* – Project Evaluation Summary, UNCDF, 1998; *Using Farmers' Knowledge as a Starting Point for Irrigation Development*, International Water Management Institute, Online document, http://www.cgiar.org/iwmi/new/andean.htm, 2000.

through boreholes and hand pumps) and *increased local organizational capacity/social capital*. Village water committees have been created in projects evaluated in India, Paraguay, and Sri Lanka, and many of these local organizations have successfully operated and managed rural water projects, water provision, and fee collection. Existing village organizations also noted strengthening as a result of project involvement.[39], [40]

56. Other issues to consider when trying to maximize the impact of water supply projects are the following: water storage contamination, unsafe piped water, and cleanliness of the pump area and water pump.

IV. LESSONS LEARNED FOR MAXIMIZING IMPACT ON THE POOR

57. The greatest value of reviewing past impact evaluations may be the opportunity to draw lessons learned for future projects so that pro-poor impacts are more likely to be achieved.

58. Part III presents lessons from the literature that will be grouped by these six themes in this paper:

- Participation
- Gender
- Decentralization
- Complementarity of inputs
- Complementarity of investments/interventions
- Project Design and Sustainability

59. Economic, non-economic, and social benefits can be observed in impact assessments. These benefits may or may not be correlated with the quality of project implementation. An example can be seen in Bihar, India.

[39] Explicit inclusion of local institutional strengthening or the creation of local water committees invariably raises the costs of a project. Commitment to water projects by the committees and members was found to be mixed, as measured by committee meeting attendance and level of fund-raising activities. Water projects not under management by local organizations have also been successful. Thus, the particular management structure is likely less important than clear efforts to gain local community involvement and ownership of water projects. *Methodological constraints* as well as the *tradeoff* between fairly costly evaluation and monitoring as a component of a project or enabling investments to reach more poor households limit the reliability and availability of good data and analysis of linkages between household and community welfare and rural water projects.

[40] *Sources:* (Caincross, 1999) and *Approaches to Assessing Health Impacts*, Technical Note 2, PRSP, 2001; *Sanitation for All – Promoting Dignity and Human Rights*/UNICEF, January 2000; *Rural Water Projects – Lessons from OED Evaluations*, OED Working Paper No. 3, 2000.

Box 9: Hits and Misses in Bihar Plateau

The Government of Bihar invested approx. US $30 million from its own budget and received approx. $120 million in World Bank funding for a rural infrastructure project that closed in 2000 (two years after the expected closing date).[41]

Objectives – The project aimed to alleviate rural poverty [this explicitly stated in project objectives] by increasing production and market access; strengthening local capacities (e.g. in planning, coordination, etc.); involving project beneficiaries; and incorporating environmentally sustainable activities.

Impacts – The project succeeded in increasing the area of irrigated land available for farming which should increase incomes. Improved rural roads and construction and rehabilitation of bridges provide greater market accessibility. Provision of drinking water to significantly more households has minimized water-borne diseases; and the experience of implementing the project has nonetheless strengthened local capacities.

An OED review of the project noted comments in regard to the following:

- **Design –** A participatory planning approach was not evident from the start. This resulted in a limited sense of ownership by the project beneficiaries, and arguably the limited local commitment did little to move the project along during a slow start-up phase. Monitoring systems to assess the real capacity of local organizations to manage the project were not incorporated into the project design. Consequently, inaccurate projections were made regarding the time to completion, as time initially budgeted for local capacity building was insufficient. OED assessed the project design as overly ambitious and complex.

- **Implementation** – Much of the construction was rushed and took place in the later stages of the project, with potential implications for the quality of construction. OED recommended a future study to assess the physical and financial sustainability of the project's works. Again, participatory involvement throughout project implementation was fairly weak, notable since this was an explicit goal of the project.

- **Lessons –** Three lessons were identified by OED in regard to involvement and monitoring systems. First, it is important to carefully gauge the 'readiness for implementation' to avoid initial start-up delays and ensure that a given project is appropriate for a given community or region. Second, monitoring systems are essential throughout the course of project implementation. Finally, local actors (e.g. project beneficiaries) must be involved from the start to enable ownership and ensure project support and appropriateness.[42] Ultimately, the project achieved notable successes; yet the review suggested that more could have been achieved with better planning and more extensive beneficiary participation.

Sources: Bihar Plateau, OED Evaluation Summary, 2001; *Rural Infrastructure from a World Bank Perspective – A Knowledge Management Framework*, Pouliquen, 1999.

60. The above example as well as key ideas from Parts I and II highlight the importance of drawing on lessons learned to improve on future interventions. What follows is a discussion of lessons learned in terms of the six themes noted earlier.

[41] There is some debate on the value of closing a project o/a its expected closing date and the consequent impact on intended project objectives. Pouliquen (1999) questions the need to finish a project 'on time' to achieve certain goals, particularly in the case of institutional capacity building, acknowledged as a time-consuming process.

[42] Pouliquen (1999) notes that beneficiary commitment *prior* to the start of a project is ideal, though not necessarily feasible in all cases. If necessary, there is an argument to be made for devoting 'extra' time early in the project stages to develop the foundation of beneficiary commitment to facilitate project implementation and future sustainability. On the other hand, several examples of projects exist and certain infrastructure sub-sectors may require less beneficiary participation, if any, to succeed; and just as many examples show high beneficiary commitment and ultimate project failure (e.g. due to low beneficiary expertise and failure to utilize the services of an appropriate consultant, or inappropriate investment selection by beneficiaries).

A. Participation

61. There has been a trend for increased community participation in rural infrastructure interventions, from investment selection to implementation. Improved participation goes beyond stakeholder consultations (with social groups, formal and informal community-based organizations, private and public sector agencies, and the civil sector) or community financial contributions, and can take the form of community-based investment selection or project implementation and management, and/or localized responsibility for infrastructure maintenance and operations.[43] Some reasons for this trend include the belief that increased participation will result in greater ownership of projects by beneficiaries and appropriateness of investment selection, and local capacity building. An OED evaluation of a rural development project in Ecuador noted the importance of including incentives in the project design to engage beneficiaries and promote their commitment to project sustainability.[44] However, what is the evidence supporting links between community participation and improved impact? The evidence shows project successes and failures both with and without beneficiary participation, and there is no simple formula for success. In most cases, however, increased participation is preferred over top-down decision-making and implementation.

62. The two Village Infrastructure Projects (VIP I and VIP II) in Indonesia described in Part I (Box 3) provide examples of success in community decision-making and participation.

63. The following achievements were observed following these projects:

- *Transparency was promoted* through public knowledge of project costs (grant amount, laborers' daily pay rates, administrative cost caps for sub-projects at the village level). Careful accounting and documentation of expenses were kept at the village level.
- *Poor villages were effectively targeted* through the project and all participating villages were committed to the project. A component of the project delegates responsibility for infrastructure maintenance to project beneficiaries. Successful compliance with this project feature is still to be determined.
- *Villagers successfully discussed and prioritized their communal needs* to determine where the funds would be invested. In cases where the village leader may have exercised stronger influence in investment selection, decisions seemed to be in line with village priorities.
- Though not required for project implementation, *villagers often provided voluntary contributions* to the project through releasing land for roads or working without pay or at low pay. Non-mandated contributions may be more indicative of beneficiary commitment to the project; and in this case were no lower than typically mandated levels.

64. In addition, VIP II built on the success of VIP I and the smooth continuity between the two projects likely facilitated positive impacts. In VIP II, sub-projects were also initiated in another very poor area of Indonesia, the island of Sumatra. This was a risky element of the

[43] For more on stakeholders in selected transitional economies within a participation framework see Kudat, Peabody, and Keyder, 2000.

[44] See Box 13 of this report for more on the Ecuador project. *Sources: Rural Development, Ecuador,* OED Evaluation Summary, 2001; *Rural Infrastructure from a World Bank Perspective – A Knowledge Management Perspective,* Pouliquen, 1999.

project that ultimately proved worthwhile.[45] VIP II permitted flexibility such that following the financial crisis, elements of the project could be expanded to other areas using emergency funds (consequently enabling job creation) and new capacities applied to other initiatives (e.g. village ownership and management of project).

65. Both projects were characterized by strong government commitment, high beneficiary participation, design simplicity, and provision of support in identified areas of need (technical assistance and capacity building, particularly in the areas of administration, financing, and engineering). Areas of both could have been strengthened or improved; however, both projects provide good examples of 'best practices'.[46]

66. In Vietnam, the World Bank-supported Community-Based Rural Infrastructure Project has a similar design. It aims to reduce rural poverty in up to 600 of the poorest rural communes in 13 provinces of Central Vietnam. Objectives are to increase commune capacity in decentralized planning and management of rural infrastructure projects, provide small-scale community-based infrastructure, and providing infrastructure-construction work opportunities.

67. The initial financial cost for participatory project components is typically greater than future costs resulting from a lack of attention to local participation.[47] However, there is the potential that participation will result in future cost-savings and efficiencies, e.g. due to fewer delays in implementation or improved maintenance by beneficiaries that 'own' their project, and intuitively, it can be considered more 'just' to enable local communities a voice and a hand in investments for their development.

68. Regarding community financial contributions, evidence from the literature shows that it is not clear how much should be required and whether it successfully encourages local ownership of projects.

69. In Vietnam, respondents and community leaders noted that very poor families were exempt from contributing to the people's contribution to rural road improvements. In one village, in Dac Lac Province, contributions were varied, depending on a household's proximity to the road (e.g. a household on the improved road would have to pay more than one further from the road), or a household's potential to see economic benefit from the road.[48]

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[45] This was risky in that Sumatra is less densely populated, with higher prices for agricultural goods and the potential for beneficiaries to have limited interest in labor-intensive methods of construction. The World Bank team who worked on this project noted that in this case taking such risks may have been required to achieve more innovative outcomes.

[46] *Sources*: *Village Infrastructure Project* and *Second Village Infrastructure Project/Indonesia*, Implementation Completion Reports, 1999 and 2000.

[47] There is often also a non-monetary cost entailed in participatory activities, which may be borne by less than willing parties. One provincial project management unit official working on rural infrastructure projects in Vietnam stated that future projects with community participation would be more challenging and time-intensive to implement than projects without this component.

Respondents in recent household interviews in Vietnam noted that there was an existing forum for community participation through village meetings, which may facilitate community participation. In these forums, however, the voice of women or the poorest may not be heard. Local authorities and project facilitators can assist in encouraging those less confident in expressing ideas to feel comfortable in sharing their views.

[48] It is unclear how the potential to see economic benefit from a road was calculated. [Reference: Ea Quang communal road, District of Krong Bac, code 09-06-04.]

Box 10: Community Financial Contributions: How much and to what end?

Examples from Bolivia (PROSABAR – Rural Sanitation Project) and South Africa (Mvula Trust water supply and sanitation program) support the link between minimum community cash contributions (5-8%) and future community commitment to project sustainability and financial management. Bolivia's project showed that communities that did not meet the minimum contribution showed poor financial management following project completion. In South Africa, meeting financial requirements was shown to strengthen beneficiary ownership of projects. The South Africa funds were not used for start-up costs, but instead used to start an emergency fund to be used for maintenance costs when needed.

Pouliquen (1999) reviewed 225 rural infrastructure projects financed by the World Bank between 1972-1996. Within the larger review of rural infrastructure projects in different sub-sectors, Pouliquen looked specifically at water projects and found that few were able to demonstrate a link between community financial contributions and water project sustainability. Three projects out of the 10 studied more closely showed a link; yet these were projects with substantial community contributions (20-55% of construction costs).

These examples show that the link between project success and extent of beneficiary financial contributions is not clear. Additionally, the required minimum level of financial contributions to secure beneficiary commitment and engagement is the project is difficult to determine.

Sources: Case Studies from a Community Water Supply and Sanitation Conference, UNDP/World Bank, 1998; *Rural Infrastructure from a World Bank Perspective – A Knowledge Management Framework*, Pouliquen, 1999.

70. In this same village, one respondent from a poor household said her family contributed to the people's fund, but she did not perceive any economic benefit from the road in that the household's economic status was the same before and after the road intervention. This could be explained by the household's inability to recognize indirect economic benefits as benefits per se, or it may support the view that the poor or very poor in rural areas do in fact receive little or lower benefit than the non-poor from rural investments. Additionally, household economic gains from road improvements may be negligible in comparison with the impact of macro shocks such as lower commodity prices for agricultural goods on which an entire village's livelihood is dependent (e.g. in this village, coffee). This particular family also faced an idiosyncratic shock when one of the family members was blamed for a crime, which led to emotional and financial hardships. Thus, a variety of factors complicate a clear understanding of the benefit of rural road improvements to this household. Current research by van de Walle and Khandker examine more closely the impact of rural roads on the poor in Vietnam and Bangladesh, respectively, and should provide greater insight on realized economic and social benefits.[49]

71. Another challenge for community participation is that in some cases local beneficiaries may not have the capacity to make the best investment decisions, though the provision of technical assistance for decision-making can help to address this. Local beneficiaries also may have low commitment to proposed projects for other reasons. For a rural water supply and sanitation project in China sponsored by UNICEF (see also Box 9 of this report), an initial challenge that had to be addressed was the low demand for sanitation facilities, due to limited understanding by community members of the link between sanitation and improved health as well as the prevailing belief that latrines were dirty places that did not merit attention or investment. Other factors and needs should certainly be considered; yet, because health benefits

[49] For descriptions of van de Walle and Khandker's research, see http://econ.worldbank.org/view.php?topic=14&type=20&id=1493 and http://econ.worldbank.org/view.php?type=20&id=1438, respectively.

resulting from improved community sanitation is relatively well-documented in the literature,[50] an argument exists for encouraging some investment in sanitation when community-driven decision-making may otherwise lead to low or no investment in this area.

72. A related issue is the role of social capital. The literature suggests that impacts are greatest when a project area has high levels of social capital. This promotes cooperation towards project goals and transparency and minimizes the likelihood of free-riding or other obstacles to success.

B. Gender

73. How do men and women benefit differently from rural infrastructure investments? Are impacts gender-specific or gender-neutral and what are the reasons for this? The literature shows that benefits can be gender-specific, in both positive and negative respects, which in turn has implications for the design of interventions for appropriate impact. The literature also highlighted the potential for differential impacts on the household (e.g. in the area of household health) related to the extent of women's participation in interventions.

74. It is generally accepted that rural water supply and sanitation investments can benefit women more than men, as women are often responsible for the time-intensive task of water collection from unimproved and/or distant water sources. Unclean water use negatively affects the health of the entire household (transmission of water-borne diseases). Poor access to water sources poses a hardship for women and girls who must transport heavy containers of water long distances and can lower household productivity because of time lost to water collection.

75. In Bangladesh, reasons given for low female school enrollment were the lack of toilets and/or inappropriate school sanitation. In India, provision of drinking water and toilet facilities was cited as a factor enabling girls to attend school (and motivating parents to permit their daughters to attend school). One negative health impact disproportionately affecting women is the fact that many women and girls in rural areas will wait until nightfall to defecate or urinate due to the unavailability of appropriate facilities. Beyond the direct negative health consequences of this practice, women are also more susceptible to violence and crime, particularly sexual violence, when they are out at night (PRSP, 2001). However, it is often still the case that when latrines exist, women and girls are not permitted use of the facilities, particularly when they are pregnant or menstruating.[51] Changing cultural beliefs towards women's roles and rights can be a valuable outcome from new projects; yet this will likely take longer than the length of time for project implementation. Nevertheless, explicit attention to this objective in the project design can be a force for positive change.

76. In a UNICEF rural water supply and sanitation program in China,[52] encouraging community leaders (including women and youth leaders) to serve as 'model' households through

[50] Examples of such literature can be found in the attached bibliography.

[51] *Sources: Sanitation for All – Promoting Dignity and Human Rights/*UNICEF, 2000; *Rural Water Projects – Lessons from OED Evaluations*, OED Working Paper, 2000; Hygiene and Sanitation Promotion, World Bank Online link, www.worldbank.org/html/fpd/water/topics/hsp/hsp_whypromote.html , 2001.

[52] Household latrines are constructed and used as demonstration models for replication in the community. The design is one that has been used in China for several years. The latrine has three compartments; the fertilizer found in the second and third compartments is extremely rich and appropriate for use by farmers. As noted in the report,

the construction of household latrines was a way to motivate other families to construct their own latrines.[53] Women often play a key role in enabling health gains; and the education of women can positively impact household welfare, particularly for poor households. A recent study of the impact of access to piped water on child health in rural India found that health benefits were larger and more significant in poor households (in the lowest two quintiles) where women were better educated, i.e. at least one female in the household has more than a primary school education (Jalan and Ravallion, 2001).

77. As noted in Part II (Non-economic/Social Impact), a rural electrification project in Bangladesh resulted in increased women's participation in managing Boards, and specific project staff positions are reserved for women.[54] A rural irrigation project in Ecuador empowered women through training, project leadership, and inclusion of women's names on irrigation rosters. These examples illustrate that women can experience improved welfare as project beneficiaries and project participants and households and communities can in turn benefit from this.

78. In Vietnam, household interviews with project beneficiaries seemed to indicate a fairly gender-neutral impact of rural road investments. Some respondents (male and female) in Dac Lac Province noted that the smoother, improved roads made it easier for women to get around on bicycles (whereas in the past it might have been perceived as more dangerous or 'unhealthy' for women). However, most respondents in both Kon Tum and Dac Lac Provinces felt that benefits, when experienced, affected men and women equally, and any difference in degree of benefit would more likely be due to differences in income rather than gender.

C. Decentralization

79. Many governments that in the past have concentrated decision-making at the national level have begun to decentralize decision-making and project implementation to lower levels of government, local authorities, and project beneficiaries. A review of the literature to assess whether decentralization results in greater project impact revealed that this is a little studied area meriting greater attention. Given the available evidence, some key ideas emerged.

80. China and India both face the challenge of providing improved sanitation to large populations and people in remote areas. However there are signs that this can be overcome through strong government commitment to appropriate policies.[55]

81. More investigation on linkages between decentralization and beneficial impact from rural infrastructure investments would strengthen the existing knowledge base for decision-making in countries experiencing decentralization. Key ideas from the literature are that local governments must see the value of a given project as a starting point for project commitment; technical assistance and trainings may be required to support local capacity building for project

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'people consider building one at home like having a family fertilizer factory'. Costs per latrine range from US $35-$84 and the potential for cost reduction exists. See also Box 9 of this report.

[53] *Source: Environmental Sanitation and Hygiene Education – Improving Coverage in Rural China,* Online document/Global Environmental Sanitation Initiative, 2001. Available at http://www.wsscc.org/gesi/wwf/china.html.

[54] Greater efforts to enable the inclusion of poor women to participate in leadership positions are still necessary.

[55] *Sources: Sanitation for All – Promoting Dignity and Human Rights/UNICEF,* 2000; *Rural Water Projects – Lessons from OED Evaluations,* OED Working Paper, 2000; Hygiene and Sanitation Promotion, World Bank Online link, www.worldbank.org/html/fpd/water/topics/hsp/hsp_whypromote.html, 2001.

implementation and management; and the national/central government can facilitate project success through real and consistent commitment to the decentralization process.

Box 11: Rural Water Supply and Sanitation: What's Working in China

UNICEF is currently working in 29 of China's 592 "national poor counties" through a '3-in-1' approach to water supply, sanitation, and hygiene education. The initiatives target areas that already have access to clean water, promoting complimentary initiatives for more effective health improvements.

The initiatives include:

- Construction of low-cost latrines that provide health and economic benefits;
- Training of community leaders, teachers, health care personnel, and other critical actors;
- Workshops on planning, management, and evaluation of projects for local government officials;
- Construction of sanitation facilities at schools;
- Evaluation of behavioral changes of beneficiaries;
- Research on affordable and appropriate technologies.

The following lessons have been recorded in regard to decentralization issues:

- Government commitment at all levels is critical for project success.
- Decentralization of ownership, and financing, will be most effective if local governments and communities understand and accept the value of sanitation facilities. This underscores the importance of complementary education and promotional campaigns, including, but not limited to, integration of health campaigns in the schools and use of community-based media.

This simple, yet comprehensive program provides helpful suggestions for other communities aiming to improve their health and welfare. To promote the sustainability of health gains, areas needing on-going support and evaluation were latrine maintenance and community hygiene education.

Sources: Environmental Sanitation and Hygiene Education – Improving Coverage in Rural China, Online document/Global Environmental Sanitation Initiative, 2001. http://www.wsscc.org/gesi/wwf/china.html; *Does Piped Water Reduce Diarrhoeal Disease for Children in Rural India?*, Jalan and Ravallion, 2001.

D. Complementarity of Inputs

82. The aforementioned UNICEF-supported project in rural water supply and sanitation and its '3-in-1' approach demonstrated the value of complimentary initiatives. An OED review of World Bank experience in rural electrification in Asia supports the importance of providing complementary services, goods, and/or equipment to maximize positive impacts of rural electrification.[56] Improved irrigation without access to fertilizer, training in new agricultural techniques, or new seeds for high-yield/high-value crops will likely have limited impact. Benefits from rural infrastructure investments in all sub-sectors can be enhanced or sometimes made possible only with the provision of complementary inputs. An example can be seen in the sub-sectors of rural roads and transport.

83. Road rehabilitation can give a village year-round access; however, a segment of the project beneficiaries may perceive little change in welfare, such as those without means of transportation. An elderly woman interviewed in Vietnam noted that the improved road

[56] *Source: Rural Electrification in Asia – A Review of Bank Experience*, OED, 1994.

benefited those with bicycles and motorbikes, yet she did not experience increased mobility since she always traveled by foot.

84. An unfortunate constraint to maximizing household welfare improvements of the poor from rural road improvements is the lack of complementary public transportation (PT) options. In villages receiving rural road investments in Vietnam where qualitative interviews were carried out, not one had PT options (e.g. rural buses or taxis) beyond the possibility of renting a motorbike to travel to the commune center. However, many respondents also noted that PT was either not necessary or not a priority. In some cases, the provision of affordable PT has been shown to provide non-economic benefits, as was observed in a small pilot project in Tanzania of the Department for International Development (DFID).

Box 12: Ambulance Trailers in Tanzania

Once roads are built, essential services do not necessarily follow. A DFID initiative in southern Tanzania promoted the use of motorcycle trailers to transport patients needing more technical care from a community health care center to the nearest hospital (distance of 48km, approx. two hours of travel time).

The trailer design made use of locally-available materials and appropriate technologies to enable easy replication, stability and a fair degree of comfort for sick passengers. It can transport two health care workers and a patient, or can be easily converted to a six-passenger cart when the stretcher is removed. Over the initial six-months (8,600km) of operations, this ambulance service proved effective in saving lives, particularly in the case of difficult pregnancies. The operations and maintenance costs are low (direct costs of fuel and maintenance were assessed at US $0.10 per km); and profits from the use of the trailer to transport passengers when it is not needed as an ambulance helps to subsidize costs.

Source: DFID Transport Newsletter, May 2000.

85. Another complementary input could be enabling credit for the poor. A strikingly common refrain with respondents interviewed in project and unimproved sites in Vietnam was the need for access to credit to improve household welfare and to complement other interventions (rural road improvements, irrigation, village electrification, etc.). Providing credit with limited restrictions, if any, on its use may give households greater flexibility for investment decisions. For example, the ability to invest in assets such as motorbikes, which could be used for income-generation, conceivably could result in expanded public transportation options. Investments in non-farm entrepreneurial activities with available credit rather than only agricultural activities may stimulate increased welfare from this source.

86. Respondents interviewed in rural areas of Dac Lac Province, Vietnam, who experienced road improvements in their villages and who did have access to credit (formal or informal sources) noted the following uses of their funds: reinvestment into the farm, e.g. spending on fertilizer, water, oil to lubricate water pump (this was the case particularly for better-off households in the sample interviewed); purchase of livestock for income-generation, e.g. pigs and chickens (this was the case particularly for the poor households in the sample interviewed); and spending for daily expenses/basic needs that could not be met through income earned.

87. Beyond access to credit, some respondents felt that were they given credit they would not know how to invest it. Many who had credit had extended their loan (most noted that significant decreases in the price of coffee from year to year led to their inability to repay on the original

maturity date).[57] This suggests value in providing the complementary input of advisory services on money management and non-farm investment options on a small scale (such as exist), to target the rural poor.

88. Complementary inputs can also include the promotion of behavioral change for health gains from rural water supply and sanitation projects.

89. A standard formula for investment selection, and appropriate combinations and timing of investments does not exist. Understanding the local context, priorities, and needs and incorporating such knowledge into the project design is a first step.[58] The promotion of complementary domestic policies can maximize a project's impact. The importance of access to credit is well documented and a need voiced by the poor themselves. Enabling this access through credit programs or implementing appropriate policies can be a complementary input to maximize the benefits derived from infrastructure investments. For example, clear land use rights and a market for land titles will enable the poor to exploit their land's value as an asset to capitalize on improvements in their area.[59]

Box 13: Water Supply and Sanitation: Encouraging Behavioral Change for Health Gains[60]

Countless studies have supported the need for *behavioral* change to enable health benefits from rural water supply and sanitation projects. The following ways to promote and enable sanitary practices for maximum impact of water supply and sanitation investments were proposed in the literature:

- In Uzbekistan, *model latrines* were constructed which were used as one element of a *community-learning sequence* for health sensitization. (Another element, for example, was a drinking water supply scheme.) Villagers met at the latrine and *participated in discussions* about its usefulness. A review of this project noted that this method of building awareness was particularly effective with men, who would come to learn about the design and technology used in constructing the latrines.

[57] Coffee farmers interviewed were able to get between 3,000-5,000 VND/kilo in the last year, compared to 10,000 VND and 20,000 VND per kilo, two and three years ago, respectively. Exogenous factors, such as commodity prices, may dictate welfare of the rural poor from year to year to a significantly greater extent than any degree of investments in rural infrastructure. This vulnerability to coffee prices was raised by all respondents (status: very poor to comfortable) in Ea Quang Commune, a project site area in the Central Highlands, Vietnam, where coffee farms are the primary means of income generation. One very poor respondent noted that, "All the people are happy with the new road. However, if the coffee price is so low then the living standards don't improve. For the village overall, the living standard depends year to year on the coffee prices."

[58] In the case of rural electrification, for example, this includes considering the essential details of intended electricity use for appropriate project design. Cost estimates should consider the efficiency of various energy sources and the likely number of hours per day these sources will actually be available or actually used in order to determine the most appropriate investments. In Pakistan, it was found that diesel pumps were cheaper to use than electric pumps, depending on the number of hours the pumps were used; yet this element was not considered in the India project promoting the use of diesel pumps.

[59] *Source*: *Rural Electrification in Asia – A Review of Bank Experience*, OED, 1994.

[60] *Sources*: *A Pilot Project in the Aral Sea Zone*, Haupt, 1998; *South Africa: Mvula Trust – An Independent Approach to Rural Water Supply and Sanitation in South Africa*, Community Water Supply and Sanitation Conference, UNDP/World Bank, 1998; *Sri Lanka – Community Water Supply and Sanitation Project*, OED Impact Evaluation Report, 1998; *Making Rural Water Supply Sustainable: Report on the Impact of Project Rules*, UNDF/World Bank, 1998; *Secondary Cities in West Africa: The Challenge for Environmental Health Protection*, Yacoob and Kelley, 1999; *Rural Water Projects – Lessons from OED Evaluations*, 2000; *Designing Direct Subsidies for Water and Sanitation Services – Panama: A Case Study*, World Bank Working Paper No. 2344, Foster et al., 2000; *Does Piped Water Reduce Diarrhoeal Disease for Children in Rural India?*, Jalan and Ravallion, 2001; *Hygiene and Sanitation Promotion*, World Bank Online link, www.worldbank.org/html/fpd/water/topics/hsp/hsp_whypromote.html, 2001.

- Sharing health knowledge is driven by two principles. First, as highlighted above, *learning is most effective when villagers can examine and use* a physical thing, and discuss its relevance to their lives. Second, *communication is easiest when people have common interests.* This implies that children can learn well from each other, women from their female friends, etc.; and a villager cognizant of health links to sanitation can be in the best position to share this knowledge with fellow villagers. Nontraditional health instructors, such as lay people, can serve as promoters in health and sanitation campaigns.
- A study of health and sanitation issues in West Africa noted that *targeting community-wide behavior takes precedence over individual behavior*, e.g. community-wide prevention of water contamination from improper fecal disposal. Barriers preventing individuals within the community from practicing good hygiene (such as extremely low income) should be considered within community-targeted campaigns and/or addressed as components of complementary projects within a comprehensive strategy for community development.
- *Social pressure can be used effectively to promote sanitary habits.* Understanding and acceptance of the value of sanitation for community health by well-respected members of the community can help to create this pressure.
- *Affordability as well as economic incentives and disincentives are critical factors* in the success and sustainability of hygiene improvements. Where subsidies for water supply are under consideration, attention should be given both to the affordability of service and as well as connections.[61] When available soap is expensive, informal soap production or alternative options should be encouraged.
- *Convenience is another key factor* in promoting sanitary habits. Pumps installed in villages in Mali did not necessarily lead to time- and cost-savings for all villagers compared to traditional sources. Villagers that did not see benefits from use of public pumps continued to use unimproved water sources. Rural households in India that had access to piped water through a household faucet (in- or outside the home) or from a nearby public facility showed higher gains in child health.[62]
- *Social marketing* should be an explicit element of the project design and should not necessarily end upon completion of physical construction. It has the effect of raising health awareness, strengthening community ownership and acceptance of the project, and encouraging sustained health gains as households incorporate healthy habits in their daily routines. People's reasons why they adopt good habits or choose to invest in sanitation facilities may *not* be primarily because of health gains. They may do so because of pride, the desire to have fresh-smelling hands or privacy, etc. Thus, social marketing and community education should choose an angle that is culturally appropriate to assist in achieving results.
- *Proactively addressing potential constraints to health gains at the micro-level, following completion of physical construction, is important.* In Mali, families continued to use unimproved water sources because they did not like the *taste* of safe water and preferred the contaminated water to which they were accustomed. Public pumps were often located by homes of *powerful families*, who at times took ownership of the pumps and *limited access* to relatives, friends, or paying customers (when costs were not meant to be covered by beneficiaries).[63]

[61] See Foster et al., 2000 for a discussion of design and administration of pro-poor water subsidies.

[62] However, a village-level comparison within the same study between villages with piped water access and matched control villages showed *no* significant difference in incidence and duration of diarrhea for children under 5 years of age (Jalan and Ravallion, 2001).

[63] In some states in Africa, the prevailing belief is that the government should shoulder the costs of water provision, allowing communities free access to water (South Africa: Mvula Trust, 1998).

E. Complementarity of Investments/Interventions

90. A key difficulty in attributing impacts to particular interventions is the frequent concurrence of interventions. A rural road can be rehabilitated, and soon after a new school may be built or a previously un-/understaffed health care center receives a new health care worker. School enrollment rates may improve and child mortality rates may decline, but it hard to really know which specific interventions are the causes for specific outcomes. While attributing linkages between types of interventions and their impacts is important to guide investment decision-making and select the options to be funded given budget constraints, and though linkages are not well-documented, the good news is that the evidence clearly gives support for benefits from investments in two or more sub-sectors (simultaneously or staggered). This complementarity results in greater impact than independent interventions.

91. Van de Walle (2000) looked at interactions between household human capital (e.g. education level attained, household size) and returns on irrigation (e.g. in terms of increased productivity, increased income) in Vietnam based on data from the 1992-93 Living Standards Survey and found that strong complementarities existed.[64] Irrigation has a beneficial impact on household income, and when various education scenarios are considered, van de Walle found that irrigation has a higher impact with progressively higher levels of education.[65] Increasing adult educational attainment in terms of primary education has the largest impact. Van de Walle suggests that these results provide support for improvements in low education areas to maximize the impact of interventions on the poor.

92. The complementarity of interventions for improved impact is also evident in rural water supply and sanitation investments. A recent study by Jalan and Ravallion (2001) found that the incidence and duration of diarrhea for under-5 children in rural areas of India was significantly lower for families that had access to piped water, versus families without access. However, children of poor families, and particularly children of mothers with limited education, did not reap these gains. Thus, the authors highlight the importance of complimentary public initiatives, such as education interventions, to raise awareness of health issues in conjunction with or embedded in rural water projects.

[64] Irrigated land as defined in the VLSS is land with infrastructure to prevent flooding or drought.

[65] Increases in education positively impacts income from non-irrigated and irrigated land, with a larger impact on the latter.

Box 14: Complementary Interventions in Vietnam

Respondents interviewed at an unimproved site in Kon Tum Province, Vietnam, felt their village's economic status was generally better for different reasons.[66] One respondent (economic status: *average*), Mr. Hanh, felt the village was better off now compared to five years ago thanks to an improved method of farming used, after the introduction of agricultural trainings by the government two years ago (2-3 times a year), and the electrification of the village (in recent years, exact year not noted). Mr. Hanh also felt conditions of the village were better because of the establishment of the health care center (in 2000) 2km from the village, and the kindergarten and primary school (both in 1997). Additionally, the farms of the village benefited from a provincial irrigation project (dam completed in 2000).

Another respondent (economic status: *poor*), Mr. Dung, appreciated better road conditions in recent years resulting in easier mobility. Though the village did not receive special funding for rural road rehabilitation, some non-project road maintenance and improvements to the dirt road by a local rubber plantation afforded the village year-round access.[67]

The road maintenance from the rubber plantation made it easier for one respondent (economic status: *very poor*), Mr. Nam, to transport fertilizer with his bicycle from a fertilizer outlet 13 km away. However, Mr. Nam, though benefiting from easier mobility, also felt that the economic status of his own household was the same as five years ago. This is probably in large part because he broke his shoulder in a motorbike accident two months ago which prevented him from working and resulted in medical costs of 5 million VND (household annual income was noted as 1 million VND). This same household cited difficulty with the decreasing productivity of the land (decreasing fertility).

Diverse interventions can thus contribute to a village's general development and are appreciated by the rural poor and non-poor alike. In this case, an intervention not explicitly intended to improve the conditions of the rural poor (the road maintenance by the rubber plantation) likely served to complement investments in the health care center, village electrification, and other services. Nam's case highlights the plight of the poor when faced with a destabilizing shock. It also supports the views that the poor and non-poor do not experience benefits to the same degree; and idiosyncratic factors affect the impact of interventions on particular households.

Source: Data from field visit, Central Highlands, Vietnam, 2001.

93. Education is often used as a proxy for health awareness. However, high rates of literacy do not always correlate with better sanitation.[68] Scope exists for improved integration of health issues in school curricula (particularly in regard to quality of subject matter taught, e.g. practical health issues faced by poor households) and awareness campaigns for the community-at-large.

94. Training materials developed for the UNICEF/China water supply, sanitation, and hygiene education program for use in project areas have the potential to be disseminated

[66] This unimproved site is 3 km away from a World Bank-supported improved road, Hoa Binh – Pleiket District Road, Code 08-07-03.

[67] One respondent gave a critique of the rubber plantation in his village. He said that when the rubber plantation was initially established, authorities promised to provide jobs to villagers on the plantation (workers come from both the village and outside of the village). However, he felt the salary paid by the rubber plantation was low. For weeding 1 hectare of land (time required = 4 days for 1 man; 5-6 days for 1 woman), one could earn 50,000-70,000 VND. Beyond that, the plantation has begun to use pesticides and the decreased demand for workers has resulted in higher unemployment. Additionally, he felt the village population was growing but there was now limited land for building houses or expanding farms.

[68] *Sources: Sanitation for All – Promoting Dignity and Human Rights/UNICEF*, 2000; *Rural Water Projects – Lessons from OED Evaluations*, OED Working Paper, 2000; Hygiene and Sanitation Promotion/World Bank, Online link, www.worldbank.org/html/fpd/water/topics/hsp/hsp_whypromote.html, 2001.

nationwide and incorporated into the national curriculum, with slight modifications and translation into local languages. Thus, education interventions can improve health gains from water supply and sanitation projects; and health interventions can also lead to advances in the quality of education.

95. Multi-sector interventions are of course often components within a particular project for rural development. In China, two projects supported by the World Bank, the Southwest Poverty Reduction Project (SWPRP) and the Qinba Mountains Poverty Reduction Project, had components targeting increased agricultural activity, improvement of rural roads, water supply and irrigation, and rural enterprise development, among other areas. Current research by Ravallion and Chen looks the impact of SWPRP. Despite challenges in analyzing available data, initial evaluations have shown benefits from this multi-sectoral approach in terms of returns to project beneficiaries from the project investment.[69]

F. Project Design and Sustainability

96. Project design examples of 'best practices' can lead to successful project implementation in terms of physical outputs, as well as in terms of immediate outcomes. However, even if realized, outcomes may not be sustainable over time. This was observed in the Central Asian republics, wherein high investments in water supply and sanitation systems did not reach all rural areas, and sustainability was impacted by political and economic instability. The question then, is how can project design be shaped for the highest likelihood of future sustainability of impact and physical infrastructure? What are the obstacles to sustainability that should be considered within the project design?

97. A project in Ecuador illustrates challenges to the sustainability of project impact as well as project implementation itself. The OED evaluation of this project proposed lessons learned for the design of future projects.

98. In the case of rural road projects, the literature found that sustainability of impacts was more likely when projects allowed for informed decision-making by beneficiaries as to type and level of service (as observed in road projects, Narayan & Pritchett, 1997, in OED Impact Evaluation Report, 1998). This was also the case for the VIP I and II rural infrastructure projects in Indonesia, providing support for local participation for sustainable impact.[70] Thus, realistic objective-setting, consideration of the external environment, and local commitment to proposed projects are a few factors impacting sustainability that should be incorporated into the project design.

[69] *Source: China – Overcoming Rural Poverty,* World Bank, 2001.

[70] Sources: Rural Water Projects – Lessons from OED Evaluations, OED Working Paper, March 2000. Hygiene and Sanitation Promotion/World Bank, Online link, www.worldbank.org/html/fpd/water/topics/hsp/hsp_whypromote.html , July 2001.

Box 15: Internal and External Project Challenges in Ecuador

An ambitious rural development project in Ecuador is unlikely to attain desired objectives by its closing date at the end of this year. The US $84 million project includes US $71 million of World Bank financing. Through a mix of physical infrastructure improvements and software components, this project intended to increase rural productivity, build local capacities (with a particular emphasis on rural women), and strengthen institutional capacities to plan and manage development projects.

Elements of the design proved overly ambitious and the external environment presented difficulties, many of which were unexpected. An OED evaluation highlighted lessons to be learned from this example.

1. Projects should be realistic in what can be accomplished. This project design attempted the following:

- Irrigation rehabilitation (flood control and waterways)
- Improvement of agriculture research and extension services
- Tree planting and natural resources conservation
- Improvement of market facilities and promotion of small rural enterprise
- Creation of a community development fund
- Improvement of feeder roads and building new rural roads
- Issuance of land titles to address issue of land tenure
- Creating a unit to monitor the project's environmental impact
- Provision of technical assistance and training to Ecuadorian implementing agencies

Very few of the intended components were successfully fulfilled and few project objectives were met. Net farm incomes did not rise to the level expected (increase of 43% instead of expected 150%) and physical improvements such as road and dam building were largely incomplete. Local capacities were not strengthened and the economic rate of return was only 3%, compared to the forecasted rate of 15%. Constraints included high staff turnover and challenges in the external environment.

2. Incentives should be embedded in project design to engage beneficiaries and promote their commitment to project sustainability.[71]

3. Performance indicators are fundamental to the project design; evaluations should occur throughout project implementation to assess consistency with intended objectives and success in hitting appraisal targets.[72]

4. Characteristics of the external environment may be uncontrollable and significantly impede project performance. In Ecuador, challenges included El Nino, war with Peru, macroeconomic instability, and falling world prices. Nonetheless, an OED review of the project noted that even if the external environment had been ideal, the complexity of the project design would have made successful attainment of all components improbable.

5. A realistic assessment of institutional capacity will assist in appropriate project planning.

*Sources: Rural Development, Ecuador/*OED Evaluation Summary, 2001*;*

Rural Infrastructure from a World Bank Perspective – A Knowledge Management Perspective, Pouliquen, 1999.

[71] Pouliquen (1999) cautions that local implementing units trained to successfully carry out a project may not necessarily have the mandate or capacity to oversee the operations and maintenance of rural infrastructure works. Thus, local institutions may have been strengthened, yet not in a fully comprehensive manner such that the long-term sustainability may be at risk.

[72] As for appraisal targets, some argument can be made that they may be unrealistic or overly optimistic, and 'delays' may be a necessary adjustment to the original project design (Pouliquen 1999).

V. CONCLUSION

99. What are the implications of the literature review and recent qualitative field work in the Central Highlands of Vietnam in regard to the impact of rural infrastructure interventions on the rural poor? Linkages are not well documented in the literature. This may be because they do not exist; because of the relative impossibility of attributing particular improvements to specific interventions given the complex project/program context (e.g. concurrent interventions); due to the challenge in carrying out pre- and post-intervention or comparative studies); because of the trade-off between spending for evaluation and monitoring or physical components of infrastructure projects; or a combination of these or other factors.

100. What is clear is the need for continued attention to impact assessments and appropriate design of such evaluations. This will shed light on what the linkages are, the degree to which these linkages exist, and methods for improving design and performance of future projects. Suggestions for innovative impact evaluations are out there, and the challenge lies in enabling meaningful evaluations within the constraints of a project budget or research budget, and following-through in the assessment. Again, this will hopefully bring poverty reduction initiatives closer to the goal of improving the welfare of the poor and the poorest, and limit exclusion of these groups from investment-related welfare improvements.

101. This paper presented a synthesis of the literature accessible from the World Bank Country Office in Vietnam. Materials from the World Bank and the OED were used most extensively. As noted earlier, the sources used affect the content of this survey and the findings that could be drawn, as is the case in any literature survey. Other, more comprehensive papers are likely to present a more thorough consideration of pro-poor project impact on a sector-by-sector analysis and sources such as these should be considered for further information by governments, development agencies, and other stakeholders. The purpose of this survey was to present key ideas that emerged from the literature, highlight similarities in experience between the rural poor globally and the rural poor in Vietnam, and point decision-makers to less obvious ideas in regard to rural infrastructure projects for more informed decision-making.

102. In considering the small-scale field study carried out in Vietnam, it appears that the impact of rural roads on the poor and very poor households interviewed in Vietnam is not very important in economic terms. Perceived impacts by poor and very poor households are for the most part non-economic or social, in that the economic value of perceived impacts is negligible.

103. The rural poor interviewed in Vietnam appreciate road improvements in their communities; yet they can also suggest initiatives in other areas to improve household welfare, such as expanded credit opportunities for the poor, or improvement of existing services, such as increased staffing of already established local health centers. The idea of complementarity of inputs and investments supports integrated projects targeting more than one area. The ability of the rural stakeholders to voice their concerns, suggestions, and needs to an interested party speaks to the importance of empowering the poor to formulate their own strategies to improve household welfare. The new Community-Based Rural Infrastructure Project in Vietnam is one example of a project that seeks to enable community-driven infrastructure selection to reduce rural poverty. Attention is needed to ensure that the rural poor (as opposed to simply the rural non-poor) are duly consulted and involved in planning and decision-making in a meaningful way.

104. Additionally, the rural poor interviewed in Vietnam have benefited from diverse interventions, besides those in rural roads, as can clearly be seen in two of the three unimproved sites visited. Thus, rural road improvements have the potential to benefit the poor, and examples show benefit. However, the apparent degree of benefit suggests caution in categorically selecting road improvements prior to interventions in other sub-sectors.

105. Needless to say, key ideas presented in this paper should not be considered definitive policy prescriptions, because of the danger of applying simplistic solutions to complex cases and country-specific issues. In sum, these ideas may be valuable as starting points for governments and policy-makers when they are considering rural infrastructure investment options, particularly in regard to those projects with a community-based component and/or the goal of poverty reduction in rural areas. Essentially, the existing arguments for selecting particular infrastructure investments (over others, or over non-infrastructure investments) are likely more valid than not; yet they should in each case be critically considered by all levels of decision-makers from the Government to the rural poor themselves.

Annex 1
Terms of Reference – Comprehensive Literature Review on the links between rural infrastructure and household welfare of the poor

Main research question: What are the links between investment in rural infrastructure development and raising the welfare of the rural poor?

Specific focus on the following areas:

- Energy
- Irrigation
- Drinking water
- Transport
- Information and communication technology

This review will consider the following questions:

- What are the impacts of investment in rural infrastructure on the poor? What are best practices from around the world? The literature review will consider country examples outside of and within the East Asia region, yet will attempt to focus on countries with contexts similar to that of Vietnam (e.g. demographics, extent of development, political environment).
- How do countries make decisions on allocating limited funds (how much to invest, on what, and regional breakdown) towards rural infrastructure development?
- What are the policy implications from this review, on the general question of linking rural infrastructure investments to pro-poor outcomes, and on the more specific question of implications for the country of Vietnam?

Sources will include the World Bank Poverty Reduction Strategy Paper Sourcebook (chapters on Energy, Transport, Water, Information and Communication Technology, Rural Poverty, and to a lesser extent, Public Spending), and relevant sources as cited in these chapters; the World Development Report 1994: Infrastructure for Development (as background); World Bank Working Papers; OED reports; recommendations from various team members (in particular, Rural Development Team) from Vietnam office; and academic journals.

The literature review will result in the following:

- Background notes for each sector (3-5 pages each, with emphasis on key questions as noted above; to be produced one per week);
- Final paper addressing the main research question and sub-questions.

Annex 2
Terms of Reference – Field Visit to Project Areas of Rural Transport I and II and Unimproved Sites – Kon Tum and Dac Lac Provinces, Central Highlands

Jocelyn A. Songco, Summer Intern with the Poverty Reduction and Social Development Unit, The World Bank, Hanoi, Vietnam, will visit rural roads project sites in two provinces of the Central Highlands to complement an on-going literature review of the impact of rural infrastructure projects on the rural poor (e.g. improvement or lack of improvement in household welfare, income, health benefits, mobility, etc.). Rural Transport Projects I and II have been completed and beneficiaries (of one or both projects) will be interviewed to determine any positive, negative, or neutral impacts of the project(s). Visits to unimproved sites and interviews with residents of these areas will be another component of the research. Unimproved sites are defined as villages without specific investment in rural road rehabilitation through RTP I or II.

The fieldwork in the Central Highlands will provide the opportunity for the following:

- In-depth interviews and discussions with project beneficiaries and respondents in unimproved sites – individually, by family, by focus group, or in a town hall setting – to determine the impact of rural roads projects as perceived by the rural poor in Vietnam. A set of open-ended questions will be developed and submitted for feedback prior to the field visit and will be used to guide the discussion. Case studies will provide a summary of the interviews and included in the final report on rural infrastructure impacts on the poor. It is expected that a minimum of 8 in-depth individual interviews, group interviews, and/or focus groups will be conducted over the course of the visit (expected duration 1 week; with the approximately 3 days spent visiting Kon Tum, of which 2 days will be spent conducting interviews; and approximately 5 days visiting Dac Lac, of which 3-4 days will be spent conducting interviews).
- Observation/participation in meetings with local authorities, project implementing units, and other key actors in the field as scheduled by Resettlement Officer Vu Hong.
- Visits to actual projects to complement understanding gained from desk research.

Interview questions will target key areas related to intended benefits of rural infrastructure investments to the rural poor to determine lessons relevant for future projects. They will likely include, but not be limited to, the following areas:

- Perceived and realized benefits, absence of benefits, or negative consequences as a result of the project – monetary and non-monetary. E.g., Did households reap monetary gains? If so, how were these gains used and how was this relevant to household welfare? Within a given household, who benefited from the project? Who was selected to participate in labor works (laborers from within or outside of the community)?
- Level of community choice in investment selection. E.g. Did households participate in the process of choosing the given investment [roads, over other options]? If yes, were they satisfied with the level of participation afforded them? If not, would they have chosen differently? This will provide qualitative data potentially helpful for the recently approved Vietnam Community Based Rural Infrastructure Project.

- Governance of project implementation. E.g. Were funds used appropriately, in a transparent manner? Was there observable or suspected corruption minimizing the success of project implementation? What monitoring of expenditures occurred and how were costs made public?
- Gender impact. E.g. How were impacts gender-specific? What would female beneficiaries recommend regarding future projects versus recommendations by male beneficiaries?
- Suggestions for future improvement in project design and implementation by the beneficiaries and local implementing actors.

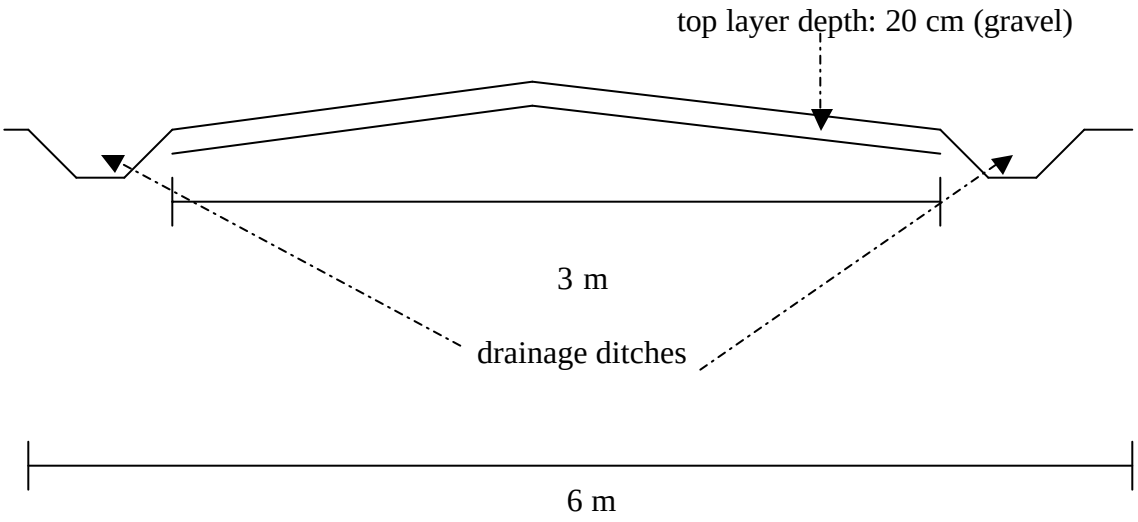
Vu Hong will provide assistance in making required introductions to local authorities and securing permission for intern's participation in meetings, when possible. A translator will be required for the interviews, who will be secured locally or selected from available Bank staff.

A write-up of the findings from the field visit will be incorporated into the final report on the impact of rural infrastructure projects on the poor, and can be submitted as a separate report as necessary.

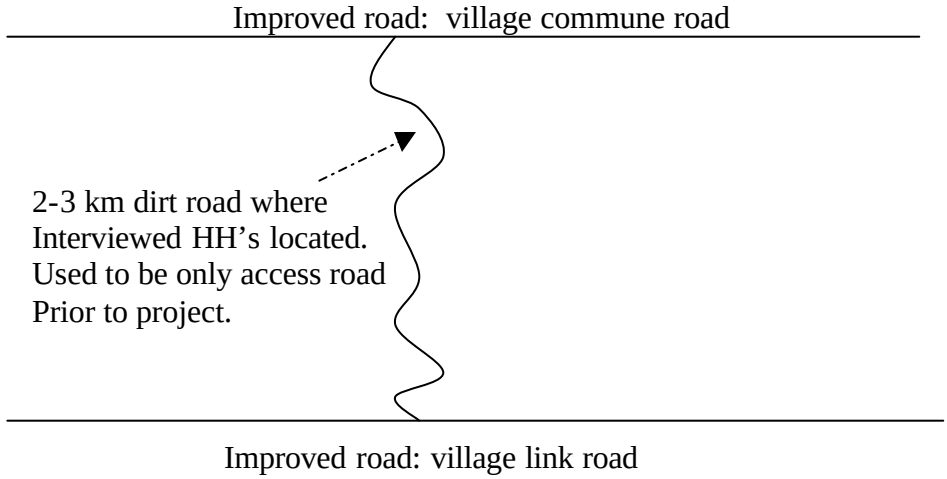
Dates: Travel from o/a July 16 (Monday) to July 21 (Saturday), 2001.

Annex 3
Rural Roads

Design of typical improved commune road in rural communes outside of the city of Buon Me Thuot:



Drawing of unimproved dirt road between two improved roads in Hoa Thuan Commune, Buon Me Thuot city.



The national road is 3-4 km away and the chief's house is 300m away.

Annex 4
Field Report on Visit to Kon Tum and Dac Lac Provinces,
Central Highlands, Vietnam
Household interviews in rural areas on the impact of rural road investments on the poor

General Summary

In order to complement desk research on the impact of rural infrastructure projects on the rural poor (e.g. improvement or lack of improvement in household welfare, income, health benefits, mobility, etc.), field research was carried out in two provinces of the Central Highlands. The purpose of the field visit was to interview poor households in sites benefiting from rural road rehabilitation through the completed Rural Transport Projects I and/or II supported by the World Bank and the World Bank and DFID, respectively to determine any positive, negative, or neutral impacts of the project. Efforts were made to interview poor households from unimproved sites in order to enable some degree of comparison between the two.

Field Research – Methodology

In-depth interviews and discussions

- **Objective.** To gain personal stories from villagers who had/did not have road improvements in their commune for better understanding of the impact of rural roads projects as perceived by the rural poor in Vietnam.
- **Respondents.** (a) Project beneficiaries and (b) villagers in comparable unimproved sites.
- **Structure.**
    - Interviews: (a) Individually, (b) by household, or (c) by group (focus group). Length of time: 1-1 ½ hrs. per interview/discussion.
    - Questions: For interviews – *Basic Household Questionnaire* followed by selected questions from *In-depth Interview Questions*. For focus groups – *Questions for Focus Groups,* modified for specific groups as necessary (Annexes 4-8).
- **Selection criteria.** Households and focus group members (excluding focus group of community leaders) having income at approximately the food poverty line, slightly above, and slightly below. Local Provincial Project Management Units will assist in identifying households in project site areas and unimproved villages to be interviewed.

Visits to project sites and unimproved sites: Project sites and unimproved sites in Kon Tum[73] and Dac Lac Provinces to carry out household interviews and focus groups.

Additional components of field visit

Observation/participation in meetings with local authorities, project implementing units, and other key actors in the field as scheduled by Resettlement Officer Vu Hong.

[73] Kon Tum is the second poorest Province in the country of Vietnam, after Lai Chau Province (out of 61 Provinces) (Baulch, unpublished data).

Interviews, and discussions with Provincial Project Management Unit (PPMU), local officials, and other community leaders to gain background on Rural Transport I and II, insight on local context, and share purpose of field visit.

Dates: Travel from o/a July 16 (Monday) to July 21 (Saturday), 2001.

Limitations of Research

A realistic assessment of the value of this research should consider its many limitations; yet maintain perspective on what it intended to accomplish. Given the small sample size and the rapid design and implementation of the research, the data and findings from this research cannot be generalized to a larger population or be considered conclusive. In addition, although some attempt was made to follow a reasonable plan to allow for comparisons between project beneficiaries and unimproved sites having somewhat similar characteristics, it would obviously still be inappropriate to draw definitive conclusions from this research regarding the differences between households in project areas and those in unimproved sites.

Other factors may have distorted the data gathered, such as the presence of local authorities and a representative of the PPMU at every interview conducted or possible misinterpretation in translation on the part of the researcher or the interpreter.[74] There is also the possibility of subject bias wherein respondents may have attempted to downplay the relative benefits to their household or their economic status due to a belief that this would benefit their household or village, e.g. perceived potential for financial assistance due to their *poor* or *very poor* status.[75] These and other limitations are significant and should constrain the applications of these findings.

The expected value of this work is the provision of qualitative data – descriptive, personal stories regarding the impact of road works on villagers' lives – to complement quantitative analyses and to support informed decision-making for rural infrastructure investments. Given the short time frame for research design and implementation, more interviews took place than the minimum target proposed in the initial research proposal, with 34 respondents participating in 21 interviews during the five days of research[76]. The respondents ranged in age from 15-69, and included a youth in school, a youth who had dropped out, single-female heads of households,

[74] It is unclear to the researcher whether the presence of local authorities (e.g. Village Chief, Vice Chief of Party Committee for a given commune, Head of local Farmers' Association) did anything to distort the responses given by the interviewees. The interviewees were generally very open, talkative, and interested in sharing their experiences (in most cases, after an initial warm-up); local leaders would often be seen nodding their agreement to interviewees' responses. At the same time, during initial interviews it was the case (until mediated diplomatically by the translator) that a village leader or the PPMU representative would interject with arguments why the road also benefited poor people, perhaps to convince the interviewee of resulting benefits or to draw attention to actual benefits that interviewees may have experienced but not recognized as such.

[75] Incorrect self-definition of economic status in *Basic Household Questionnaire* is unlikely because for all respondents providing the necessary data, when the stated income and household size is considered, the households' self-defined economic status (*very poor, poor, average, comfortable, rich)* was appropriate. For example, Mr. Dung noted his household's status as *poor*, and the annual income was 2,400,000 VND, whereas the poverty line for his four-person household would be 3,840,000 VND. Mr. Hanh noted his household's status as *average* and the annual household income was 9 million VND (poverty line for this household of seven would be 6,720,000 VND). Mr. So noted his household's status as *very poor*: annual household income was 1,200,000 and the poverty line for this family of four would again be 3,840,000 VND. See Annex 10 for more on the poverty line in Vietnam.

[76] These totals include 5 casual interviews with village leaders (6 officials) of different research sites and PPMU staff (2 staff members).

men and women, village leaders, and village elders. The interviews were individual interviews, by couple (husband and wife), and in groups of 2-4 people (same and mixed-sex).

Description of Research Structure

Respondents from a project site (4 respondents) and an unimproved site (5 respondents) were interviewed over the course of two days in Kon Tum Province, as well as a casual interview with a PPMU representative. The project site in Kon Tum was the only ethnic minority (Do Dra group) village where interviews were conducted. Interviews in Kon Tum Province took place with the village chief, men, women, and youth of the villages.

Respondents from two project sites (totaling 7 respondents) and two unimproved sites (totaling 10 respondents) were interviewed over the course of three days in Dac Lac Province, as well as interviews with local authorities of both types of sites (6 respondents) and a casual interview with a PPMU representative. Interviews in Dac Lac Province took place with village leaders, including officials of the local Party Committees, Farmers' Association, men, and women of the villages.

Thus, household interviews were conducted with 26 respondents, excluding casual interviews with local authorities and PPMU staff.

Both individual and group interviews were conducted. Questions used were drawn from both the *In-Depth Interview Questions* and the *Questions for Focus Groups*. No focus groups per se were conducted, though some interviews involved 3-4 people (excluding local official and PPMU staff observing interviews).

The PPMU and researcher discussed options and decided mutually on areas to be visited. Given the time constraints and the primary purpose of the field work being to conduct interviews, the researcher did not attend any meetings scheduled by Resettlement Officer Vu Hong, as indicated in original terms of reference.

Findings

Exogenous factors can limit the effectiveness of rural road investments in raising household welfare of the rural poor. Poor families cope with idiosyncratic challenges that may have caused and/or may be the primary reason why they cannot escape from poverty. Challenges can be grouped into two categories: those that have strong potential to be addressed through the use of assistance programs or appropriate policies by the Government, community-based organizations, or NGOs; and those that are more difficult to address through policies or programs.

Challenges that interviewed households faced that lend themselves to assistance through programs or policies included the following:

- *Lack of knowledge on how or where to invest increased income or funds borrowed (through formal or informal lending)*. Assistance could be in the form of investment advisory services, consultancies for small businesses, and small business/management training opportunities. Small businesses have the potential to create off-farm employment, and can absorb those unemployed due to low coffee prices or provide livelihood opportunities to those confined at-home such as mothers or the elderly. However, if the intent is to assist the rural poor, these services and trainings should be designed such that they are accessible and of an appropriate scale for the poor.

- Lack of access to credit (as perceived by the poor) or poorly structured lending schemes for the credit opportunities available. Those ineligible to borrow (due to formal lending requirements, e.g. possession of land titles to use as collateral) turn to informal sources for money, both for investment in income-generating activities and to pay for daily living expenses. Interest is charged for formal credit, and this varied from 1-1.25%. For informal credit, interest was varied and in some cases no interest was charged (respondents noted that this was dependent on the relationship between the lender and the borrower). In one case, a farmer was able to pay off his informal loan through labor. In another case a household noted that they would know if they needed to pay interest at the end of the coffee season.[77] In yet another case, one woman paid approx. 0.25% in interest (monthly, for a one-year period) to her neighbor. In many cases, those who could borrow (formally or informally) did not have to pay the principal until the one-year loan period was over. Also in many cases, households extended their loans (with a consequent increase in interest owed) because they were unable to repay their debt at the end of one year. Though this scheme may be appropriate or effective in many or most cases, it is possible that smaller monthly or quarterly payments will assist households to better manage their funds.

  Credit options (formal and informal) for the poor present an interesting area for further research. There seems to be a disconnect between the striking demand for credit voiced by poor households interviewed, particularly for those in Dac Lac Province, and the fact that informal credit from neighbors, often with no or lower interest rates in comparison with formal credit, does seem to be an option.[78] As credit was not a key area considered in this field visit, and given the small sample size, it is difficult to confidently draw any conclusion on micro-credit in rural areas from this research.

- *Single-source income/single-headed family.* One *very poor* respondent noted that though she owned a relatively large plot of land suitable for farming, she was not able to do so because she had to be at home watching her youngest daughter (aged 3). She is eligible for credit but her application was not approved because there were others worse off who received priority, given the limited funds available. Low-/No-cost support could be provided to single-heads of households, e.g. through the encouragement of support groups (if none already exist) that may be able to provide childcare services (on a shared/rotational basis) and where informal credit and savings cooperatives could be formed.

Challenges faced that are difficult, yet not impossible, to address through programs or policies included the following:

[77] If the (informal) lender made a high profit on his harvest in a given year, then no interest would be owed; otherwise a lower profit would require the borrower to pay some interest (amount not noted). This condition would imply a negative impact from low coffee prices on the poor household on two levels: likely a lower income due to lower daily wages or lower demand for his labor, and the need to pay interest on money borrowed.

[78] Out of 15 respondents interviewed in Dac Lac Province (all non-local authorities/non-PPMU staff; from both project areas and unimproved sites), 12 noted credit as a need to improve household welfare. Of those 12, four already had access to formal credit but wanted additional credit (maximum loan amounts permitted depended on factors such as land size, use of credit, etc.); four were ineligible for formal credit and borrowed through informal credit; and four respondents noted ineligibility for formal credit but were not currently borrowing informally. For the three respondents that did not note the need for credit to improve household welfare, all were currently borrowing from the Bank for Agriculture and Rural Development.

- *Vulnerability to weather conditions:* yearly flooding and droughts. The value of irrigation investments can be considered.
- *Decreasing coffee prices.* Promotion of off-farm employment, agricultural trainings to suggest ways of crop diversification, and official support (monetary and non-monetary, e.g. approval) to grow crops other than coffee or rice can be valuable.

Combined interventions and idiosyncratic factors can enhance the effectiveness of rural road investments. The household that seemed to be one with the highest welfare of households interviewed (per observation, income earned in relation to household size, and funding available through formal credit) had the following characteristics:

- *Diversified income sources.* Mr. Son (non-poor; self-defined economic status: *comfortable*) earned a stable income from his position as the Vice Chief of the Farmers' Association. Mrs. Phuong raised pigs, and both worked on their farm where they grew coffee and rice.
- *Access to credit from the Bank for Agriculture and Rural Development.* They borrowed 10 million VND to buy a truck for their farm; resulting in a 1 million VND annual savings in transport costs compared to the prior year when they rented a buffalo-driven cart when necessary to transport coffee and rice [total spent on transport from year to year not noted].
- *Assets that can contribute to income-generation or provide security against shocks.* They owned the recently-purchased truck, a motorbike, a pump on their compound for their home garden, and other home appliances (television, radio).
- *Completion of relatively high level of education.* Mr. Son completed 9th grade and Mrs. Phuong completed 10th grade. For those respondents whose grade levels of completion were noted, the levels were lower: for men, the average grade completed was grade 6 and for women, the average grade completed was grade 5.[79]

[79] Household respondents (i.e. excluding village leaders and PMU staff interviewed via casual conversation/informal interviews) *whose completed levels of education were noted* (of which there were 20 in total) were characterized by the following: Female (9 respondents): completed up to grade 3 (2 respondents), grade 4 (1), grade 5 (1), grade 6 (1), grade 9 (2), grade 10 (1), and did not attend school (1), with (average = 5.4); and Male (11 respondents): completed up to grade 2 (1 respondent), grade 4 (1), grade 5 (4), grade 6 (1), grade 8 (1), grade 9 (1), grade 10 (2), (average = 6.3).

The two couples with the highest education (hereafter, highest educated couples) had one spouse completing grade 9 and one completing grade 10 (husband, wife, respectively; and wife, husband, respectively). These two highest educated couples were found in an unimproved area and in a project site, and earned the highest incomes (15 million VND and 12 million VND, respectively) out of all respondents reporting household income (18 households reported estimated annual incomes, totaling 80,050,000 VND, i.e. average annual income = 4,447,222 VND). One of the highest educated couples felt they were *average* compared to the community, and the other, *comfortable*, respectively. Both also borrowed money from the Bank for Agriculture and Rural Development (10 million VND and 25 million VND, respectively). This suggests these families would show higher consumption than most, if not all, respondents. In the cases of the 20 respondents who reported their level of education attained, there seemed to be a positive correlation between level of education and household economic status. The two households with the highest levels of education were *non-poor*, in terms of household income and size and the MOLISA poverty line.

- *Location of house on the improved road.* However, many better-off homes (per observation) were also found on unimproved roads, and very poor households were also found on the improved roads.

Roads are likely to provide higher economic benefit to better-off households. Poor households can experience both economic and social benefits from rural road improvements, but poor respondents perceived that the existence of these benefits was often less frequent, less certain, and on a smaller scale than for better-off households.

Poor households interviewed in project sites were not necessarily better off in economic and non-economic terms compared to poor households interviewed in unimproved sites. In one unimproved site, households benefited from other interventions including some degree of road maintenance funded by a state-owned rubber plantation in the area, the establishment of a kindergarten, primary school, and health care center, and electrification of the village in recent years.

Any impact from rural road improvements is likely gender-neutral. Two respondents noted that women were able to use bicycles to get around more easily following road improvements in their area. Every respondent (male and female) in the first three days of interviews noted no change in women's role in the household and the community during the interviews. These questions were eventually dropped from the interviews to allocate interview time more wisely.

Project beneficiaries and respondents from unimproved sites noted that opportunities existed to participate in community decision-making, particularly through town hall meetings. However, it is unclear to what extent the poor participate (in general, not only for these projects) beyond giving financial contributions. One respondent noted that she was able to participate in decision-making through attendance at village meetings. When the question was probed further, she noted that she did not speak at meetings but just listened to what others had to say. Respondents were not involved in decision making for these road improvements; RTP I and II did not make community participation a project component. The recently approved World Bank supported Community Based Rural Infrastructure Project explicitly hopes to improve local capacities and provide community-based infrastructures.

Conclusion/Implications from the Research

The field research provided data in support of many of the key ideas in the literature review. Generally speaking, the interviews indicated that the rural *poor* and *very poor* perceive lower economic benefit from rural road investments than the rural non-poor. These perceptions can range from a negligible benefit to no benefit at all. All respondents cited some degree of non-economic and social benefit(s) from rural road investments; yet it is unclear if the degree of benefit justifies the cost. At a minimum, all households with road improvements benefited from easier or greater mobility, to some degree, which provides support for attainment of the objective of increasing access to these areas. The larger report will discuss implications of the existing evidence supplemented by data from this study.

The data collected from this small-scale qualitative study will feed into a larger final report on linkages between rural infrastructure investments and impact on household welfare of the rural poor. Given the limitations of this study, it would be inappropriate to propose definitive, specific implications from this data alone.

Annex 5
Basic Household Questionnaire/Project Beneficiary

1. Name of interviewee(s) _____
2. Sex _____ Age(s) _____
3. Occupation(s) _____ Level of education completed _____
4. Spouse name _____
5. Spouse sex _____ age _____
6. Occupation(s) _____ Level of education completed _____
7. Children – Name(s) Ages Enrolled in school (Y/N)
   _____
   _____
   _____
8. Other household members (relatives, non-relatives)
   Name Age Occupation Relative(Y/N)
   _____
   _____
9. Main source of income _____
10. Members of the household that work, occupations, and est. % contribution to HH income:
    _____
    _____
    _____
11. Average HH monthly income _____
12. Is HH income stable or unstable? _____
13. Debt owed? (Amt., to whom, since when) _____
14. Economic status of HH within the community: [very poor, poor, average, comfortable, rich]: (per respondent) _____ / (per observation) _____
15. What is your HH's current economic status now, compared to before the [construction of/rehabilitation of] the road in your community?
    [Better off, same, worse off] _____
16. What is the economic status of your village now, compared to before the [construction of/rehabilitation of] the road in your community?
    [Worse off, same, better off] _____
17. Proximity of road to house: _____ (km)
18. Household Assets:
    House [big, average, small] _____. Quality [good, average, small] _____.
    No. of rooms _____. Own/Rent _____. Land size ____Ha. Own (Y/N) ____.
    Other assets [motorbike, bicycle, vending stand, etc.] and how used:
    _____
    _____
19. Access to services (Y/N, Since when?):
    Electricity _____ Latrine _____
    Clean water _____, Time necessary to access water _____
20. Additional comments/observations:

Annex 6
Basic Household Questionnaire/Unimproved Site

1. Name of interviewee(s) _____
2. Sex _____ Age(s) _____
3. Occupation(s) _____ Level of education completed _____
4. Spouse name _____
5. Spouse sex _____ age _____
6. Occupation(s) _____ Level of education completed _____
7. Children – Name(s) Ages Enrolled in school (Y/N)
   _____
8. _____
9. _____
10. Other household members (relatives, non-relatives)
11. Name Age Occupation Relative(Y/N)
12. _____
13. _____

14. Main source of income _____
15. Members of the household that work, occupations, and est. % contribution to HH income:
16. _____
17. _____
18. _____
19. Average HH monthly income _____
20. Is HH income stable or unstable? _____
21. Debt owed? (Amt., to whom, since when) _____
22. Economic status of HH within the community: [very poor, poor, average, comfortable, rich]: (per respondent) _____ / (per observation) _____
23. What is your HH's current economic status now, compared to before X years ago?
24. [Better off, same, worse off] _____
25. What is the economic status of your village now, compared to before X years ago?
26. [Worse off, same, better off] _____
27. Distance of house to nearest road: ____ (km). Describe nearest road _____
    _____
28. Household Assets:
29. House [big, average, small] _____. Quality [good, average, small] _____.
30. No. of rooms _____. Own/Rent _____. Land size ____Ha. Own (Y/N) ____.
31. Other assets [motorbike, bicycle, vending stand, etc.] and how used:
    _____
    _____
32. Access to services (Y/N, Since when?):
33. Electricity _____ Latrine _____
34. Clean water _____, Time necessary to access water _____

35. Additional comments/observations:

Annex 7
In-depth Interview Questions – *Draft for Comments*
Project Beneficiaries

A. Impact of roads (General)

1. How did the road construction/rehabilitation impact [affect] your family?
2. Please describe your/household's life [situation] *before* the project. [If necessary, prompt in these areas: livelihood opportunities, economic status, vulnerability to shocks, level of mobility, health.]
3. Please describe your/household's life [situation] *after* the project.

B. Services

1. What services do you have in your village? [if necessary, prompt with the following: primary school, secondary school, health care center, post office, bank, telephone, modes of public transportation…]
2. Which of these services do you use?
3. What services are new services that came during/after/because of the project?
4. What services are located outside of your village?
5. [Services outside the village:] Do you use them? How do you use them?
6. How does the road affect your ability to use these services outside of the village? [If necessary, prompt with the following:
   Do you use them more/less/same now than before the road was built?
   Is it easier/cheaper/better [e.g. access year-round, vs. seasonal access] now with the [new] road or no difference?]
7. What public transportation options do you have? Are these services affordable for your family?

C. Income

1. What is your household income? [If sensitive, develop ranges of income with local translator and have respondent choose income range.
2. N.B. this question can be asked in BHQ or at during these interview questions.]
3. Is this more/less/the same as before the project?
4. What was the effect of the road on your family's income level? [Helped, hurt, no change] Why?

D. Consumption Patterns

1. If you have more income now, how do you use this income?
2. Who manages [budgets/keeps/controls] the money in your house?
3. What do you spend your money on?
   [Prompt as necessary: food, clothing, education, farming/business expenses, housing/rent, housing/maintenance, water, electricity, fuel, transportation, health, leisure]
4. How much of your monthly income do you spend on each of these things? [Get proportions/percentages.]
5. Is there any change in how you have budgeted your money in the past X years? [Give number that is approx. 1 year before road completion.]

E. Intra-household relations

1. You said that ____ manages the money in your house. Who makes decisions about how money is spent?
2. Who makes decisions concerning your children? [Attend school or not; work or not…]

F. Gender impact

1. What is the role of women in your family?
2. What is the role of women in the community?
3. How do you think the road affected the men in your community?
4. How do you think the road affected the women in your community?
5. How do you think the road affected the children in your community?

G. Governance/Participation

1. Do you think the money spent on the roads was used correctly?
2. Was it spent in a public/clear manner? Did you know how the money was being spent?
3. Did you participate in the project? If yes, how?
4. Do you think you, your neighbors, other community members should participate in projects like this one? How [in what capacity]? Why?

H. Suggestions for future improvement in project design and implementation

1. What did you think was good about this project and how it was carried out/done?
2. What did you think was not good about this project and how it was carried out/done?
3. Do you have any suggestions for how the project could have been done better/differently?
4. Do you have any suggestions for different needs of your household to improve your situation?
5. Do you have any suggestions for different needs of your community?
6. Do you have the opportunity to share your ideas with the people that make decisions about community projects? How do you do this?

Annex 8
In-depth Interview Questions – *Draft for Comments*
Respondents from unimproved site(s)

A. General

1. Please describe your/household's life [situation] now compared to *X years ago*. [If necessary, prompt in these areas: livelihood opportunities, economic status, vulnerability to shocks, level of mobility, health.]

B. Services

1. What services do you have in your village? [if necessary, prompt with the following: primary school, secondary school, health care center, post office, bank, telephone, modes of public transportation…]
2. Which of these services do you use?
3. What services are new services and when did they come? Why do you think these new services came to your village?
4. What services are located outside of your village?
5. [Services outside the village:] Do you use them? How do you use them?
6. How not having a [good/year-round access] road affect your ability to use these services outside of the village? [If necessary, prompt with the following:
   Do you use them more/less/same now than *X years ago*?
   Is it easier/cheaper/better now *than X years ago* or no difference?]
7. What public transportation options do you have? Are these services affordable for your family?

C. Income

1. What is your household income? [If sensitive, develop ranges of income with local translator and have respondent choose income range.
2. N.B. this question can be asked in BHQ or at during these interview questions.]
3. Is this more/less/the same as *X years ago*?
4. What would help raise your family's income level? Why?

D. Consumption Patterns

1. If you have more income now compared to *X years ago*, how do you use this income?
2. Who manages [budgets/keeps/controls] the money in your house?
3. What do you spend your money on? [Prompt as necessary: food, clothing, education, farming/business expenses, housing/rent, housing/maintenance, water, electricity, fuel, transportation, health, leisure]
4. How much of your monthly income do you spend on each of these things? [Get proportions/percentages.]
5. Is there any change in how you have budgeted your money in the past X years? [Give number that is approx. 1 year before road completion in comparable project site area.]

E. Intra-household relations

1. You said that ____ manages the money in your house. Who makes decisions about how money is spent?
2. Who makes decisions concerning your children? [Attend school or not; work or not…]

F. Gender impact

1. What is the role of women in your family?
2. What is the role of women in the community?
3. Do you think the role of men in your community has changed in the past *X years*? If yes, how? Why? If no, why not?
4. Do you think the role of women in your community has changed in the past *X years*? If yes, how? Why? If no, why not?
5. Do you think the situation for children in your community has changed in the past *X years*? If yes, how? Why? If no, why not?

G. Governance/Participation

1. Who makes decisions about investments for the village?
2. Do you think it is necessary/important/good for you/your neighbors/other community members to participate in efforts to help the village overall? How [in what capacity]? Why?

H. Suggestions for future projects

1. Do you have any suggestions for different needs of your household to improve your situation?
2. Do you have any suggestions about the different needs of your community?
3. Do you have the opportunity to share your ideas with the people that make decisions about community projects? How do you do this?

Annex 9
Questions for Focus Groups* – *Draft for comments*

A. Community leaders, Community Elders or Male focus group

1. What effects did the [new/rehabilitated] road have on your community?
   [If necessary, prompt with the following areas: income, services, livelihood opportunities, accessibility/mobility, health.]
2. [If not obvious:] Do you think the road brought mainly positive, negative, or no significant changes to your community?
3. Who do you think benefited from the new/rehabilitated road? [E.g. by sex, by occupation, by economic status, etc.] Why?

B. Female focus group

1. What effects did the [new/rehabilitated] road have on your community?
   [If necessary, prompt with the following areas: income, services, livelihood opportunities, accessibility/mobility, health.]
2. [If not obvious:] Do you think the road brought mainly positive, negative, or no significant changes to your community?
3. Do you think women benefited from the new/rehabilitated road? Why?
4. Do you think women should be involved in/participate in projects of this kind? How? Why?

C. Youth focus group

1. What effects did the [new/rehabilitated] road have on your community?
   [If necessary, prompt with the following areas: income, services, livelihood opportunities, accessibility/mobility, health.]
2. [If not obvious:] Do you think the road brought mainly positive, negative, or no significant changes to your community?
3. Do you think the young people in this community benefited from the new/rehabilitated road? Why?
4. Do you think that young people/the youth should be involved in/participate in projects of this kind? How? Why?

* Maximum # participants for focus groups is 6. Time for discussion no longer than 1 ½ hours. *Introduction*: Introduce myself, purpose of project. Emphasis that discussion is on impact on the community. *Conclusion*: Repeat/confirm key points and notify that copy of field report will be sent back to community.

Annex 10: Calculating the Poverty Line in Vietnam

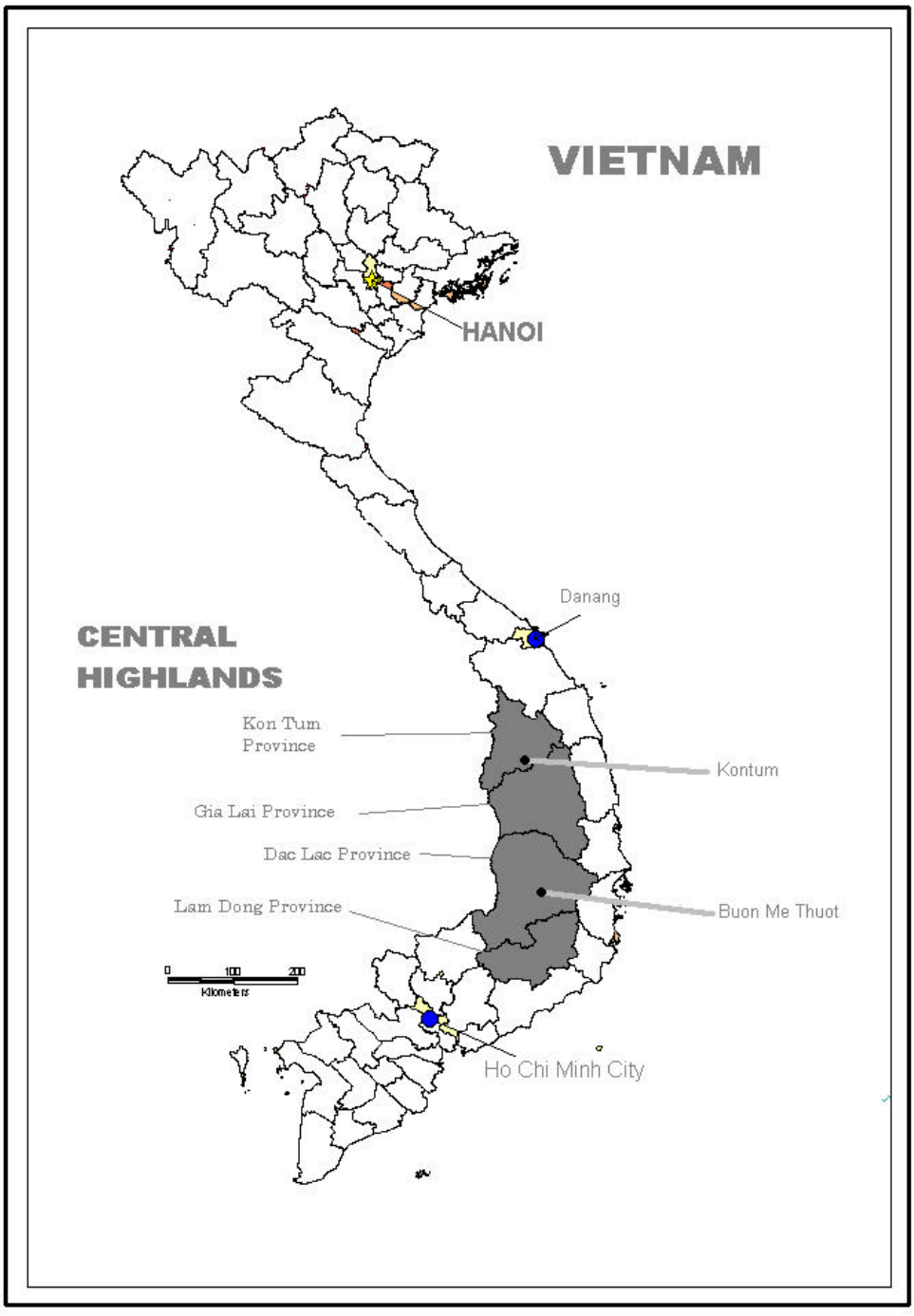
The Ministry of Labor, Invalids, and Social Affairs (MOLISA) in Vietnam calculates the poverty line in Vietnam by the following:

Urban:	150,000 VND per person per month
Rural plains, e.g. delta and coastal regions:	100,000 VND per person per month
Rural mountainous and remote regions:	80,000 VND per person per month

Kon Tum and Dac Lac Provinces are considered rural mountainous and remote regions.

Annex 11

Map of Vietnam: Central Highlands (Shaded Portion)



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