

Paper presented at the International Seminar on Rural Road Transport to on the 15-16 May, 2002 in Siem Reap, Cambodia

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Revised September 2006

Roads and Poverty Reduction

Introduction

This paper distills some of the lessons learned on a project carried out in Uganda with Cowi Consultants, financed by Danida. It also draws on work done in Vietnam under World Bank financing. The Uganda project showed that traditional road selection criteria, usually economic, are not adapted to meeting poverty reduction objectives. Poverty targeting requires criteria which are difficult and time consuming to apply and for that reason, unpopular. It was also clear that poverty reduction measures need subsidies. Such roads cannot pay for themselves. The Vietnam project highlighted the conflict between precise poverty targeting, requiring complex selection methods, and the difficulties of applying them locally in a consistent manner. There are diminishing if not negative returns on complexity.

Briefly, this paper tries to make the point that simply investing in roads will do little to improve the situation of the poor. Isolation is certainly a contributing factor to poverty. Nevertheless, benefits from roads tend to be distributed in inverse proportion to the level of deprivation of the people they serve. To counteract this, poverty reduction initiatives require investment in road networks to be situated within the larger context of making services more accessible. They must then be carefully targeted to ensure that the poor can profit from the increased mobility they provide.

I have not provided references as I feel the Internet has become the most accessible source for up-to-date information. Those interested in more detail can also refer to my website (<http://www.ruralroads.org>) and to the links to pertinent sites which it provides.

Poverty, Isolation, Mobility and Accessibility

Poverty reduction has become an overriding objective for governments and donors. It always has been, of course. However, too great a faith was placed in maximising economic growth, with the result that differences between rich and poor often increased rather than decreased. In the very long run, everyone may benefit from growth. In the shorter term, the one we live in, those already well off are too often the best placed to take advantage.

Poverty and Isolation

Poverty is at the same time a simple reality and a complicated concept. We usually know it when we see it. On the other hand, like most concepts, when we try to define it, we find that precision becomes more and more elusive. It is obviously relative, and must take into account the norms, expectations and resources of the society in which it is imbedded. The suffering it causes may be constant but perceptions of it vary over time. In advanced economies today's poverty line would have demarcated the wealthy two hundred years ago. Nevertheless, no matter how we define it, its existence demonstrates an unacceptable tolerance of inequality within and between countries for which history may someday severely judge us.

Chambers proposes a five dimensional scale to describe deprivation: physical weakness; lack of income; vulnerability; powerlessness; and isolation, since those who are cut off from the community cannot share in its benefits. Ideally, reduction measures should act on all these since progress in any dimension will sooner or later be constrained by one or more of the others. In practise, such an integrated approach would be difficult and we are generally forced to take a piecemeal approach, concentrating on one or at best a few dimensions.

The causal link between road improvement and poverty reduction is thus very indirect. True, in rural areas the poor often do not have access to those services which they most need. This lack of access may be physical, which can be helped by mobility enhancing measures such as roads, or it may be due to any combination of the factors listed above. Poor people, families and communities are often unable to realise their potential because they are isolated. However, they may also be dominated by other groups and unable to influence their future or that of their children no matter what measures are proposed. They may be too vulnerable to strokes of bad luck and thus unable to take even small risks which could lead to getting income. Many may simply be unable to pay the fare.

Traditional development criteria for roads prioritisation, generally favouring economic activity, have been clearly ineffective in targeting poverty. Roads may increase the potential for mobility, but the poor are often the worst placed to profit from it. Benefits are usually captured by the better off. Careful targeting is therefore necessary to ensure that road improvements reach the isolated for whom poor access is definitely a contributing factor to their deprivation.

Accessibility and mobility

Mobility is a measure of the ease or difficulty with which people, goods and information can move around. More places are accessible when people are more mobile. Alternatively, the need for mobility is lessened when services are moved closer to users. A road is one of the many ways to make services more accessible by making people more mobile.

Accessibility measures how easy or difficult a place is to get to. A place is accessible when a person can get there with what he or she considers an acceptable outlay of time, effort and money. Risk of not getting there through accident or unforeseen delay could also weigh heavily. A place is inaccessible when the outlay to get there is greater than the benefit expected once arrived.

Need for a Core Network

However, providing road access to poor and isolated areas requires road network improvements and extensions, costly to maintain and not necessarily sustainable since motor vehicles will be few. This can only be guaranteed by building upon a coherent and economically viable core network, capable of being maintained by a mix of local and national funding to that standard appropriate to satisfy user needs for year-round motorable access. It goes without saying, when poverty reduction is the objective, that labour-based methods (<http://www.ruralroads.org/labour.html>) are essential. Without this, poverty targeting risks being even more unsustainable and ineffective.

The core network

The Core Network is that part of a road system whose maintenance to a level allowing the all-year movement of motor vehicles is essential to ensure an equitable degree of access to services for as many of the population as possible. Its definition is vital when lack of resources severely limit the size of the network that can be maintained. If it has been well chosen, it will be more or less sustainable. Its existence is a precondition to investment in less sustainable poverty reduction measures.

It should be defined pragmatically using all knowledge available on the services most used, inside or outside the area, and the routes normally used to get to them. Connections with higher or lower level networks must be considered. Road condition and traffic surveys as well as community preferences should be used to identifying redundant links and bottlenecks. Coverage of the core network may be extended or levels of service improved as funds become available.

The core network is thus an over-riding priority. Heavily used roads, major assets but the most vulnerable, that can be ranked according to conventional cost-benefit criteria, such as the Internal Rate of Return (IRR), must continue to be the first priority for improvement works and subsequent maintenance. Remaining roads, not meeting this criterion, but considered essential from the standpoint of network coherence and access, may be ranked according to cost-effectiveness criteria, for example, total population served relative to the costs of provision.

Work on the core network only marginally addresses poverty reduction. All-year motor roads alone will not provide access to services for the poor. Community access roads, tributary to the core network, where bicycles and pedestrians are almost the sole users, must also be selectively improved. Given the weakness of management structures at the community or local level, sustainability will be a perennial problem unless community management capacity is simultaneously strengthened.

Selection criteria

<http://www.ruralroads.org/select.html>

The Internal Rate of Return (IRR) calculation compares savings to users (both motor vehicles and others) from an improved road to the time sequence of investments and expenditures necessary to realise them and summarises them in a simple index which takes account of the fact that deferred consumption has its price. A threshold or minimal value of 10-12% return on investment is generally considered to be satisfactory as being an acceptable margin over the cost of borrowing capital.

The index is useful in that it is relatively light on data, is intuitively acceptable, and does not require as many subjective judgements as other prioritisation methods. Unlike cost-effectiveness, it can be used not only to rank roads, but to determine the necessity and scope of rehabilitation and maintenance works, dictated by the level of service that vehicles require and the road wear imposed by them. Its use within poverty alleviation will not necessarily lead to acceptable programmes, since the benefits quantified are those captured by the owners and operators of motor vehicles. The population will benefit to the extent that the direct beneficiaries perceive any advantage in sharing them by lowering tariffs or improving the quality of service.

Cost-effectiveness measures the extent to which a course of action satisfies a given objective so that it can be easily compared with others. In its simplest form It may be the number of people living close to a given link, divided by the cost of keeping it at the system-wide minimum level of service. More complex indices are possible, depending on the objectives. Unlike cost-benefit analysis, it does not try to measure how good the investment is on an absolute scale. It can be applied to rank those roads lightly used by motor vehicles, when user benefits are scarce, which may have an important social role and cannot be neglected.

The method, unlike the previous one, does not show whether a road should be included. It does however allow better poverty targeting. The contribution to poverty reduction of the simpler criteria depends on the proportion of poor in the zone of influence (which, if known, can be used as a weight to target poverty reduction), on the extent to which poor access is a contributory factor, whether improved mobility is in fact an effective solution, and whether road transport in fact make the poor more mobile. Finally, all population-based criteria contain an inconvenient bias since they exclude those who are isolated since they are too far from the road.

The Basic Access Approach

Work on the core network only marginally addresses poverty reduction. All-year motorable roads alone will not provide access to services for the poor. Community access roads, tributary to the core network, where bicycles and pedestrians are almost the sole users, must also be selectively improved. Given the weakness of management structures at the community or local level, their sustainability is unlikely unless community management capacity is simultaneously strengthened.

Poverty and isolation are linked. Social equity considerations also require that as many as possible should have at least the possibility of using a motor vehicle in case of emergency. The basic access approach provides a way of identifying rapidly the poor and isolated, and offers an effective strategy for targeting poverty directly through road and track investment. An isolation threshold is defined consensually at the local or national level. This can be based on the maximum acceptable distance to be covered on foot to get to a motor road, or alternatively a maximum access time to basic services.

Basic Access

The Basic Access approach provides a criterion for allocating resources within a network that integrates poverty reduction objectives while being relatively simple to apply. It presupposes that the entire population have a right to a certain minimal level of service, here defined in terms of an acceptable walking distance (say 4-5 km) to a motor road leading to higher level networks and the services usually located on them. In some countries it is even viewed as a basic human right. Lack of basic access, however defined, implies isolation, a dimension of poverty.

Definition of isolation must be pragmatic reflecting a compromise between local perceptions of what constitutes an acceptable distance and resources available. Having agreed on it, isolated groups can be identified using maps, followed by fieldwork. The Basic Access approach, combined with direct verification that isolation-related poverty actually exists and can be reduced by better access to services, offers a way of targeting poverty through road investment. It does not, however, confirm that road access is the best way of making the poor more mobile.

It is simple to apply. Maps, augmented by local knowledge, can be used to identify those who are geographically isolated from the core network. Visits must confirm that isolation in fact does contribute to their poverty and that improved mobility offered by motor vehicles will help to alleviate it. If this is so, a minimal programme of road improvement can be agreed upon and costed.

Integrated Rural Accessibility Planning

Nevertheless, roads are not enough, neither to guarantee access to services, nor to combat poverty. The approach offered by Integrated Rural Accessibility Planning (IRAP) offers more promise for poverty targeting than a roads driven approach. It analyses external and internal accessibility problems directly with those who must live with them and proposes a wide range of solutions, including roads, to solve them.

Rural Accessibility and Transport Planning

<http://www.ruralroads.org/access.html>

Greater accessibility comes at a cost. There is always a trade-off between moving or multiplying services and making it easier for people to move around. Integrated Rural Accessibility Planning (IRAP), developed as a tool within community travel and transport projects, provides a systematic way of consulting people, both men and women, about their real priorities, making the necessary trade-offs with their participation and coming up with a series of measures that best reconcile desires for better access and resources. Improving motor roads will probably be one of the measures but not necessarily the most important.

RATP offers the most direct approach to poverty alleviation among the different approaches in that solutions, providing that the poor have participated in their formulation, have the greatest chance of reducing their isolation.

Hierarchy of strategies to reduce poverty

A hierarchy of strategies to reduce poverty through road investment can now be defined. Conserving the core network is without doubt the most viable strategy from an economic standpoint, while rehabilitating it is less so. As we extend the core network towards isolated communities, economic viability in the narrow sense declines and poverty reduction objectives must come into play. In general, poverty targeting gains in precision when criteria move from economic, through social, to direct identification of isolation and associated poverty. As an ultimate step, the roads constraint can be lifted and poor accessibility, the direct cause of poverty, attacked through a wide range of measures, including road improvement.

Unfortunately, sustainability moves in the opposite direction. The chances that users and producers will fund maintenance more or less locally are greatest when roads are well used by motor vehicles and the results clearly visible. Rehabilitation is notoriously difficult to finance without external aid. Prospects for sustainability further decline with traffic volume and as we move towards more remote and poor areas where not only money but management and technical capacity is lacking. Annual subsidies, from central government, almost certainly with donor support are thus essential to make poverty reduction measures work.

Conclusions

In conclusion, poverty reduction requires criteria that explicitly seek out the poor and propose solutions tailored to their needs. More precisely, indicators which show where they are, whether roads are likely to be of any use to them and if not, how best can the services they need be made more accessible to them.

Motor vehicles play a minor role in the lives of the poor, so measures that target isolation and explore a wide range of ways to increase mobility will be the most effective. Economic criteria relying on motor vehicle benefits are therefore very blunt instruments. However, they are necessary to identify the sustainable core network on which poverty reduction initiatives, themselves unsustainable without subsidy, must be built.

The Basic Access criterion offers a simple method to selectively channel road investment towards meeting the access needs of the poor. Although restricted to roads only, it can be implemented more rapidly and cheaply than Integrated Rural

Accessibility Planning, which nevertheless remains the best way to target accessibility needs. It is not incompatible with the latter approach and may be used to prioritise its implementation.

The table below will help to visualise the hierarchy of strategies in terms of an increasing focus on poverty reduction. Maintaining or rehabilitating the heavily used core network, although the keystone of road transport strategies, has only an indirect impact on poverty. Expanding it to include links with less motor traffic relative to other users will bring it closer to the population at large and thus enhance general mobility. Applying a basic access criterion will shift the focus to poverty reduction, providing, of course, that isolation is a significant contributory factor in the peripheral areas concerned. Finally, IRAP will enable a close-up view of accessibility problems in a specific area and indicate specific measures to target deprived groups.

Hierarchy of Poverty Reduction Strategies					
Strategy Focus	Prioritisation criterion	Primary beneficiary	Impact on poverty	Sustainability	Funding
Core network: Maintainable roads (economic roads) mainly used by motor vehicles (ADT 20+)	Cost-benefit (Economic Rate of Return (ERR) of 10% or more)	Road users Mainly road users in proportion to their investment in means of transport	Very indirect: Depends mainly on decisions taken by transporters and agricultural producers	Very sustainable Since users and producers benefit financially and visibly	Mainly National and Local Governments
Core network: Roads requiring rehabilitation to restore maintainability	Either ERR greater than 10% or very high cost-effectiveness	Road users and population (rich and poor) in the zone of influence)	Indirect: Depends on poverty incidence in the communities concerned	Moderately sustainable: Depends upon the selection criteria	National Governments and donors
Core network: Maintainable roads mainly used by non-motor vehicles (ADT < 20)	1)ERR: probably less than 10% 2) Cost effectiveness	Population close to the road	Indirect: Depends on poverty incidence in communities concerned	Less sustainable Since benefits are less visible and the average beneficiary poorer	Mainly National and Local Governments
Isolation and poverty (Basic Access) Roads linking the core network with isolated parts of poorer sub-counties	1) Communities more than an acceptable walking distance from a motorable road (4-5 km) 2) Indications of isolation-related poverty.	Poor and isolated communities	Direct when isolation is a significant determinant of poverty for the community concerned	Not sustainable without subsidy since economic viability will be very low	Donors, NGO, Community
Rural Accessibility Measures to improve access to basic services. Can include roads	Prioritises strategies for improving access through 1) Increasing mobility (improving roads, tracks and paths, 2) Making means of transport more available) and 3) Bringing services closer to users	Selected Communities	Very direct since it targets accessibility needs of both men and women. Poverty can be targeted explicitly using indicators.	Moderately sustainable since maintenance costs will be low and time and money savings high.	Donors, NGO, Community