

Social dimension of transport planning

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Every technology has a social imprint of the society where it evolves and also where it gets used. Transport technologies and systems are no exception. Transport technologies are used in public spaces, in the presence of intended users and non users. Urban transport systems development, planning and operations evolve to meet the mobility needs of the society. The existing patterns also reflect the prevailing social values. I would like to argue that if the planned systems do not meet the mobility needs of the most vulnerable or the "critical member" of the society, all users face sub-optimal conditions of operations and transport investments do not result in the intended mobility, safety or environment benefit. In fact the exclusive transport systems which meet the needs of the few only result in unsafe highways and urban areas including high crime rates. Therefore, recognizing social dimension as an integral part of transport planning methodologies, evaluation procedures, and infrastructure design guidelines leads to optimal solution for all.

Social dimension is an important concern for rural as well as urban areas. For rural areas the major focus is given to increasing access to rural population to employment, health facilities and education. Yet in countries like India, 50% villages remain unconnected by all weather roads. In fact regions, which have large number of small villages remain unconnected. This raises questions about existing planning and investment criteria used for rural road planning. Planning and design of National highways(NH) and State highways(SH) present another aspect of social costs and benefits, because the impact on the local population, living in the vicinity of the highway corridor is very different from the impacts on the long distance users of highways. Similarly, since urban areas in low income countries are heterogeneous where often different income groups interact, including social dimension in planning and designing the system becomes challenging and inevitable.

Acknowledging the differential needs of the urban and rural poor, transport strategies and programs can be designed to provide the poor with better physical access to employment, education, and health services. In an urban setting this often translates into ensuring adequate public transport including the services of the informal sector and non-motorized transport; in a rural context, transport programs should ensure the provision and maintenance of rural access facilities through community participation in decision making and project implementation. Similarly, transport policies can be focused to give particular assistance to the poorest groups either directly by highlighting the needs of particular social groups, or indirectly through assistance to those modes of transport on which the poor are known to be particularly dependent,¹ sometimes referred to as "targeted" interventions.

1. Rural Road Planning

In rural transport, transport infrastructure and, more importantly, transport services are critical to the economic and social development of rural communities. Rural transport investments can serve as powerful and transformational vehicles of social change. Improvements in rural transport increase access to markets, farm inputs and social services such as health and education; support indirectly the development of a non-agricultural rural economy; and improve information flows and access to urban areas.

The catalytic, economic potential of rural transport infrastructure and services has not been realized. Equity has not reached the rural areas of many developing countries. Rural transport investments, especially roads, have faced particular discrimination in terms of funding because they are expensive. The low volume of traffic does not produce a high enough economic rate of return. Furthermore, they serve district access transport activities rather than regional or national functions, and they are difficult to maintain because of institutional and financial complexities in many developing countries. The benefits of such projects are increasingly seen to outweigh the costs as project planners begin to factor into their analysis the significant social benefits that transport infrastructure produces for rural communities. Improved transport alone cannot reduce poverty, yet it plays a crucial and complementary role to the sectors of agriculture, education and health and their poverty alleviation efforts.

Rural areas throughout the developing world are characterized by isolation and impoverishment; they experience serious access constraints to markets, social services, and transport services. Many parts of rural Africa and Latin America become virtually inaccessible during the wet seasons due to inadequate infrastructure. Studies investigating the relationship between improved transport and socioeconomic development found that accessibility is a key factor in rural development. For example, one study discovered that the average annual farm income for households producing cash crops is a continuously increasing function of access value, and that the efficiency of agricultural production increases considerably with an increase in access value.² Interventions in this sub-sector have focused on the provision of reliable, all-weather transport infrastructure; provision and promotion of intermediate means of transport (IMT); and provision of complementary services or programs.

There are two important questions for rural road planning methodologies and investment criteria. (1). Since limited resources must be used to produce maximum beneficial impact, villages with large population have received priority. This is reflected in the methodology adopted by the rural planning organizations in India. Since 1943, when the first twenty year road development plan known as Nagpur plan was prepared, attempt has been to maximize accessibility to majority of the population. The first plan set the target that in agriculturally developed areas no village should be more than two miles away from any road or five miles from a main road. In non-agricultural areas and less developed areas the target was no village should be more than five miles from a road or 20 miles from a main road. Thus priority was given to already developed areas. In fact in the third road development plan (1981-2001), it was proposed that all villages with a population of 500 persons or more should be connected by all weather roads by 2001.

Criteria for budget allocation also adopted priority for areas where a rapid increase in agricultural production is expected-40% of the total budget, 20% to areas where no immediate returns are expected.³ Planning commission recommended 70% of total expenditure for linking villages over 1500 population. This has resulted in 92% connectivity of villages having more than 1500 persons and 38% for villages having less than 1000 persons. However, often regions which are underdeveloped and have very high incidence of poverty also have large number of small villages. Despite being under developed these regions have not received priority for investing in rural roads. Clearly the criteria for investment which is based on benefit assessment has favoured the already developed regions. The methodology of benefit assessment needs to be based on the understanding of the regional development requirements, morphology of village or settlement patterns to include cluster of small villages instead of individual village population.

Inclusion of poverty components with highway investments is becoming more common. Thirty-four percent of highway projects prepared by the world bank in 1997 included a poverty alleviation objective.⁴ The Road Improvement for Poverty Alleviation (RIPA) under the China: Tri-Provincial Highway Project was aimed at providing all-weather access to villages and towns traversed by the highways. The RIPA components focused on lower level roads in the poorest counties. A six-stage screening procedure was developed to select rural roads and included, *inter alia*:

- Identifying priority counties based on their poverty profiles;
- Applying a cost-effectiveness criterion to select rural road systems based on maximization of population served and connectivity to as many settlements as possible; and

Analyzing social benefits of rural road provision with respect to increased access to health and education facilities and services, reduced transport costs and increased employment opportunities. These efforts have to be strengthened and serious research efforts are required to understand short term and long term benefits and costs of investing in poorer regions first compared to agriculturally advanced regions which ensure immediate economic returns.

(2). Unlike long distance roads(highways), users of rural roads often do not have the capability of paying for the new or improved facility directly through toll charges. This calls for different financing methods like road development taxes on the regional market centers and other businesses which are beneficiaries because of the road improvement. Another example is from Nepal. The Nepal Road Maintenance and Development Project⁵, which is under preparation by the World Bank, plans to provide support to labor-intensive road building in the rural districts. Because of long distances, difficult terrain and low traffic volumes, this project would not have been judged viable based on economic rate of return alone. However, the expected positive outcomes for poverty alleviation in the isolated districts of Nepal and the improved access to health, education, and other services have been taken into consideration. There has been a broadening of how the Bank views sustainability, and it is no longer sufficient to talk only of economic sustainability. Poverty alleviation, distribution and equity, and social services to the poor must also be factored into the discussion about sustainability. In general, experience has

demonstrated that rural or feeder roads play important roles in the collection and distribution of goods, in generating the traffic volumes needed to support major investments in highways and ports, and in stimulating the economic and social development of an area.⁶

Appropriate Transport Infrastructure

Many rural areas are typically serviced by community level infrastructure – tracks, trails, paths, and footbridges – that connects them to the closest village or municipal district more than the classified network does. For example, in the Peru Rural Roads Rehabilitation and Maintenance Project⁷, household surveys and beneficiary workshops underscored the functional importance of the unclassified network of tracks and footpaths that are vital for servicing the transport needs of the rural poor and women in particular. Through a participatory planning process, communities determined and set priorities among a number of alternative routes that fulfilled similar trip purposes. Communities ranked the provision of more reliable and safer tracks as a high priority. Improvement to community transport infrastructure, it was anticipated, would enable more regular trips and more goods transported, which in turn effects an increase in agricultural production, increases in rural income, and ultimately better opportunities for education. Indeed, ex-post evaluations of rural transport investments find that improved accessibility through the provision of all-weather transport infrastructure produces positive economic and individual benefits for rural communities.⁸ These benefits include improved access to regional or national markets, improved marketing of local production, expanded consumer options, and new economic opportunities.

2. National Highways and State Highways

It is assumed that by being more responsive to the concerns and problems of the local population living in the vicinity of highway corridor and by considering how to improve overall mobility, transport projects can make an important contribution toward poverty alleviation. Improvement to community transport infrastructure enables more regular trips and more goods transported, which in turn results in an increase in agricultural production, increases in rural income, and ultimately better opportunities for education. Indeed, ex-post evaluations of rural transport investments find that improved accessibility through the provision of all-weather transport infrastructure produces positive economic and individual benefits for rural communities.⁹ These benefits include improved access to regional or national markets, improved marketing of local production, expanded consumer options, and new economic opportunities. However, there exists a conflict between the demands of the local traffic and through traffic. In India, vehicles using National and State Highways (NSH) have a wide variations in operating characteristics, and tractors and animal carts often share the carriageway with fast moving motorised traffic. NSH passing through villages and towns are used by local traffic also, resulting in wide variations in direction, speed and vehicle mass. Pedestrian activity is also high in these stretches. In the context of our socio-economic conditions, limited access highways for some heavily traveled corridors are possible only if the accessibility of the local population is ensured by major design changes. This includes convenient cattle and slow vehicle passes, and parallel service roads. Land acquisition remains a very difficult issue and often international safety guidelines are ignored to limit the cost.

Road accidents are estimated to be responsible for 500,000 deaths and around 15 million injuries per year. It is forecasted that road accidents will represent the third leading cause of death and disability in the world by 2020. The increasing rate of road accidents imposes social and economic costs on a nation's development. In terms of economic impact, this fatality and injury rate represents \$53 billion of lost production costs to developing nations – equivalent to the level of all international aid. With respect to socio-economic costs, it is important to recognize which sectors of society are affected by road accidents. Safety is an issue that affects the poor more acutely. Women and children, who are often pedestrians, are disproportionately the victims of road accidents, especially in countries with high and mixed levels of motorized and non-motorized traffic using the same road.

NH and SH together carry more than 70% of the total road traffic in India. Safety has become a major concern on these roads. The problem is especially serious and difficult when NSH pass through villages and towns. The local traffic and activities around the highway cause congestion at daytime and these locations can become a bottlenecks for fast through traffic. However, at night and when the volume of local traffic is low and vehicle speeds high, these road sections become a major safety hazard especially for the local population. This demands that when NSH pass through villages and towns, safe passage must be ensured to through traffic consisting of trucks, buses and cars as well local traffic consisting of bicyclists, pedestrians and other non-motorised traffic. Road construction and maintenance consume a large proportion of the national budget, while the costs borne by the road-users are often neglected. According to study sponsored by the Ministry of Road Transport and Highways (MoRTH), road accident costs alone account for at least 0.69 of the GDP of India¹⁰. This amounts to billions of rupees a year. Besides, this cost does not include human suffering and pain due to injury and loss of life, which defies valuation in monetary terms. These issues demand equal attention in designing counter measures to mitigate the various risks. It is, therefore, vitally important that policies be pursued which, within financial and other constraints, minimise total transport costs for the individual road links and for the road network as a whole.

These issues have assumed more importance in recent years because of the conflicting demands expressed by those who want speedy through traffic conditions on NSH on one hand, and the inhabitants of towns and villages who demand safety for themselves on the road. The latter have been successful in constructing speed breakers, usually by force, on NSH passing through their villages all over the country. Though construction of speed breakers on NSH is illegal, the authorities have been unsuccessful in curbing this practice. The speed breakers so constructed do not follow any standards and the design is based on forcing vehicles to slow down as much as possible. Though this serves the objectives of the local inhabitants, these speed breakers cause a great deal of annoyance to the drivers of vehicles and can even be hazardous at high speeds if not seen early enough. In such a scenario, it becomes necessary to look at the issue in a scientific manner and evolve traffic calming guidelines that suit both the parties.

NSH pass through many different sizes of small towns and villages. The density of these settlements varies depending on the region. Since these are not limited access roads, they are intersected by other category of roads forming intersections on the main highway. Upgrading of the network must ensure that the needs of long distance traffic be addressed along with the needs of 'local' traffic, which includes slow moving vehicles like bicycles, animal carts, tractors and pedestrians. Capacity and speed enhancement strategies for NSH must address the safety concerns of other than the long distance road users present on the network. In the light of present commitment of the government to upgrade NSH sections, these corridors which pass through villages and towns present a challenge which must be addressed to develop a safe and efficient highway network in the country. To do this meaningfully, particularly when dealing with large and diverse road networks, the following areas of action are required:

- Development of guidelines for adequate and safe provision of cuts in the median on divided highways.
- Development of guidelines for provision of frequent and safe underpasses for local traffic, pedestrians, bicycles and other non motorised traffic.
- Establishment of standards for paved shoulders along with the fixing of physical and luminous separation devices like cats eyes.
- Traffic calming standards in semi urban and urban areas.
- Guidelines for provision of service lanes along national highways where villages, towns and cities occur at frequent intervals.

3. Urban areas in low income countries

Many cities in the Indian subcontinent, Sub-Saharan Africa, and some of the poorer cities of Latin America are characterized by rapid population growth, an economy heavily dependent on the informal sector; widespread poverty and informal housing areas; basic problems of environment and public health; and difficult issues of governance. These regions are characterised by the dominance of large cities, which experience such extremes of wealth and poverty that they can be characterized as having dual or multiple economies. One economy serves the needs of the affluent and features modern technologies, formal markets, and outward appearance of developed countries. The other serves disadvantaged groups and is marked by traditional technologies, informal markets, and moderate to severe levels of economic and political deprivation. Urban poverty characterized by unemployment, dependence on the informal sector, low wages and insecure jobs has a direct bearing on travel and transport demand of a large segment of the population residing in urban areas. Their dependence on transport which enables them access to job markets becomes essential for survival. This need is more critical for them than for those with high-income and secure jobs. Therefore, access to affordable transport is necessary for survival

The transport needs of the poor would be better met by supporting the informal sector. The poor confront everyday problems related to mobility such as access to employment, social services, educational opportunities and domestic tasks. Non-motorized users, who are primarily the poor, are the majority in Sub-Saharan Africa (on foot) and Southeast Asia and South Asia (bicycles, cycle rickshaws, bullock carts, and traditional country boats on the inland waterways). However, they are often neglected in the design and

modernization of transportation infrastructure. Their presence on the highway is considered illegal. The existing road design does not cater to the needs of pedestrians, bicycles, or any other slow moving traffic. Service roads if present, are not maintained well. Footpaths are either not present or poorly maintained. There are no specific facilities provided for buses also, except locating bus shelters. Approach to bus shelters, bus priority lanes, continuous pedestrian paths, lane for slow vehicles like bicycles and rickshaws etc. have not been included in the road network designs. Consequently all road users have to share the carriageway. This often leads to unsafe conditions for pedestrian and slow moving vehicles and congested conditions for motorised vehicles.

The present mix of traffic in Asian cities results in varied activities on the streets. Bicycles, pedestrians and bus traffic attracts street vendors. Vendors often locate themselves at places, which are natural markets for them. A careful analysis of location of vendors, number of vendors at each location and type of services provided demonstrates the need for their presence. If the services provided by them were not required at those locations, then they would have no incentive to continue staying there. However, road authorities and city authorities view their existence illegal. Often the argument is given how the presence of street vendors and hawkers reduces road capacity. If we apply the same principle that is applied for the design of road environment for motorised traffic, then vendors have a valid and legal place in the road environment. Highway design manuals recommends frequency and design of service area for motorised vehicles. Street vendors and hawkers serve the same function for pedestrians, bicyclists and bus users. As long as our urban roads are used by these modes, street vendors will remain inevitable.

Street vendors also enable integration of various activities and functions in and around public spaces. The mixing of various functions and people makes it possible to interpret how the surrounding society is composed and how it operates. What are important are not the formal integration of buildings and primary city functions, but whether the people who work and live in the different buildings use the same public spaces and meet in connection with daily activities. An inclusive street environment requires pedestrian, bicycle and public transport friendly streets. Inclusive streets ensure not only safe mobility- reduced risks of traffic crashes but also reduced street crimes and better social cohesion.

3.1 Captive users of non motorised vehicles and public transport

Cities in the South have captive riders of buses and non motorised vehicles. Despite hostile environment, they continue to walk or bicycle or use overcrowded buses because their survival in the city depends on that trip. Urban arterial roads, which are designed for motorised vehicles only operate under sub optimal conditions and reduced efficiency because often one lane is occupied by pedestrians and other slow moving vehicles. State authorities and 'experts' continue to plan infrastructure which ensures fast movement of car traffic at the cost of pedestrians and non motorised vehicles. Basic needs of pedestrians are not recognized as part of urban transport infrastructure. In a recent study (IIT, 2000) pedestrians were observed at selected junctions on a major arterial road in Delhi. The study shows that nearly 70% pedestrians cross the road when it is safe for them to cross, i.e. either it is green for pedestrians or green for right turning

vehicles which makes half crossing safe. The number of pedestrians waiting at the median is more than those waiting on the side of the road, even though there is no pedestrian island in the median. The road median does not provide any convenient space for waiting, however, restrictive measures for pedestrians are instituted such as high medians(30-50 cms) and guard rails on medians. Often, construction of pedestrian subways and foot over bridges are to ensure that the pedestrians do not obstruct the motorised traffic and the road is available to motorised vehicles only. These poorly located pedestrian subways continue to have low usage rate not only because of poor location also because of safety concerns they are often locked at night. This leaves no option for pedestrians but to either break the median fences or run across at the risk of losing their life. Pedestrians have to spend more time and energy to cross the road.

Attempts to introduce clean technologies disregarding social compulsions often have adverse impacts. For example in Delhi some of the present bus users may be forced to either switch to two wheelers or bicycle long distances if the new CNG buses raise fares. Similarly, the Supreme court directive of changing the public transport fleet to CNG has already reduced supply of public transport vehicles in the city and also introduced RTVs(rural transport vehicles) running on CNG. Thus attempts to reduce traffic emissions introduces inappropriate technology from a commuter's perspective. The RTVs are designed for rural operations and not for the convenience of urban commuters. Again, these will be used by people who have no choice, and may encourage some people to move away from public transport. Both increase the risk of getting involved in traffic accidents in the present infrastructure. Even if there are marginal environment benefits, the social cost of increased traffic crashes to the most vulnerable section of the society is very high. A well functioning road infrastructure must fulfill the requirements of all road users. In the context of the present socio-economic realities of most Asian cities, pedestrians, bicyclists and other slow moving vehicles cannot be eliminated from the urban landscape.

Social dimensions of transport systems

Vulnerable groups lack mobility which also means accessibility to income generation opportunities and most of all contributes to exclusion from urban life. Exclusive urban environment or exclusive streets create violence at different levels. Survival compulsions forces people to defy laws: often they are exposed to higher risks in traffic and victims in fatal road traffic crashes. This violence or injuries is created by insensitivity of state planners and infrastructure designers who ignore the existence of pedestrians, bicyclists and public transport users.

Cities where authoritarian administration is successful in implementing the laws against vulnerable groups, i.e., ban pedestrians, cyclists and rickshaws, along with hawkers and street sellers, often streets are reduced to areas which is of "no interest to anyone". Street crime is highest on such streets. Millions of people in the cities of Africa, Asia and Latin America cannot find work in the formal sector and have to create work themselves. Streets provide opportunity for self employment and honest living with dignity. However, when this is denied, what options are left for survival? Not surprisingly safety is one of growing urgency as cities in many countries are becoming more violent which further

restricts access and mobility in the city including women children and high income residents.

Sustainable transport needs inclusive cities. Inclusive cities are also safe cities. It is going beyond physical infrastructure. It is also providing opportunity for honest living. Inclusive streets ensure not only safe mobility, - reduced risks of traffic crashes, but also reduced street crimes and better social cohesion, and makes public transport attractive, and the preferred choice for commuting.

Urban poor tend to live on the outskirts of the city center. Travel to and from work often takes several hours, and can cost as much as 30 percent of personal income. In having to walk places because they cannot afford the cost of using “for-payment” transport, the poor spend time and personal energy that could have been used for productive activities aimed at raising their living standards. Another feature of the urban poor is the high number of non-motorized road users (pedestrians and cyclists). The poor walk long distances on minimally maintained footpaths, and negotiate traffic hazards since they must cross or walk through motorized vehicle roadways. They often carry heavy and even hazardous loads on their heads, backs or hips for long distances, thus increasing the risk of physical injury or debilitation. The urban poor also have a greater likelihood of dealing directly with the repercussions of poor air quality due to lax vehicle emission controls.

Experience shows that urban transport projects should take the following considerations into account:¹¹

- Improve physical access to jobs and amenities and reduce time spent walking;
- Reduce barriers to the supply of informal transport services (mini-bus, public motor vehicles);
- Regulate or privatize urban bus services;
- Enable greater use of intermediate means of transport by improving rights-of-way, interchange infrastructure, and attention to safety and eliminating fiscal and financing impediments to vehicle leasing or ownership; and
- Eliminate gender biases by integrating the transport needs of women into transport policy and planning processes.

In summary, integrating the needs of the captive users of transport facilities, pedestrians and bicyclists on the highways as well as urban areas is recognizing the social dimension of transport planning. The understanding of differential needs of the urban and rural poor, transport strategies and programs can be designed to provide the poor with better physical access to employment, education, and health services. In an urban setting this often translates into ensuring adequate public transport including the services of the informal sector and non-motorized transport; in a rural context, transport programs should ensure the provision and maintenance of rural access facilities through community participation in decision making and project implementation. Similarly, transport policies can be focused to give particular assistance to the poorest groups either directly by highlighting the needs of particular social groups, or indirectly through assistance to those modes of transport on which the poor are known to be particularly dependent,¹² sometimes referred to as “targeted” interventions. In inter city highway setting this means design changes to

meet the needs of safe accessibility and mobility of the local population to be treated as an integral cost of the project and not as an after thought. This approach ensures that needs of the captive users of transport facilities are integrated in the formal designs and laws and their presence is not viewed as illegal.

Gender and Urban Transport

Research on the differences between the travel patterns and transport needs of men and women in the urban context are not as well developed as in rural areas. In urban areas, women's essential trips are more dispersed in time and location. Some of the transport constraints urban women face include:

- Greater distance between home and employment opportunities reduces the compatibility between household and non-household activities.
- Irregularity of services on off-peak and non-radial routes. Most urban transport systems are not designed to respond to women's needs to combine multiple trips, many at off-peak hours and off the main transport routes.
- Sexual harassment discourages women from traveling, particularly at night.
- High costs of private transport forces the poor, especially women, to wait for publicly operated bus services.

As many of these trips are related to home or child-care provisioning, they are considered inessential and therefore do not receive the appropriate attention of transport planners. The combination of "multi-tasking," poor service, and vehicle access severely limits the time available for other, more productive activities.¹³

In the India State Highways Program, consultations have also shown that men and women often have different priorities when it comes to compensation or assistance to replace lost assets such as land or homes. Men frequently prefer cash compensation, while women have stated they would like support in kind, such as replacement land, a new home, or assistance in learning new skills.

Similarly, women in India and elsewhere frequently depend on resources available by the roadside for firewood and water, for drying cowdung for fuel, and other purposes. Upgrading a small rural road to a multi-lane highway may have negative effects on the local population, which may disproportionately affect women. These impacts are addressed as an integral part of the resettlement activities, as support to vulnerable groups and communities. Experience from these and other projects demonstrate the importance of gender analysis, and of taking into account of risk factors related to longer term viability and sustainability of the household.

Inclusion of Social Dimension in Planning Methodology

Following methods have been suggested to include social concerns in transport planning. Socio-economic surveys: Administered to collect baseline and gender-specific information on the target or beneficiary population to assess socio-economic benefits of roads and access services and to establish a set of indicators aimed at measuring the socio-economic impacts of road project. Suggested data to be collected:

- Demographic information of a sample population (ethnicity/caste, gender, age, religion)

- Forms of livelihood (land holdings, land cultivated, income, type of crops, non-farm employment including migration)
- Transport data (average daily load, distance and time to and from the nearest road, type of transport, costs of transport)
- Access to social services and status of social well-being (distance to primary and junior high schools, enrollment rates by gender, access to primary health facility/nearest hospital, days lost due to sickness in the previous year)
- Access to markets (costs, time, and by main mode of transport, marketing channel of main crops)
- Commodity prices (of major crops and fuel)

Semi-structured interviews: An interview questionnaire should gauge households' perceptions regarding their access issues to resources, services, opportunities, transport constraints and needs, priority problems; the importance they assign to improving their transport conditions, willingness to participate in the maintenance of rural road network (roads/paths/trails). The questionnaire should also reveal existing transport options and services available to user groups, frequency of usage, costs of such services and their impact on household income, and preferences for transport options.

The questionnaire should also assess bottlenecks experienced in using available transport option and services as well as assess the needs of beneficiaries and other user groups for services that may complement rural road investment. For example, promotion of appropriate, low-cost non-motorized means of transport or the introduction of transport reducing measures such as siting the water pump or grinding mill closer to the village.

Focus group discussions: These are held with village leaders, district/local government representatives and other key informants to obtain baseline data about the community and an overview of its travel patterns, transport constraints and problems. Focus group discussions are held separately with each stakeholder to draw their experience and knowledge of the issues involved in project selection, preparation, and implementation.

Willingness-to-pay surveys: Administered among a select and representative group of beneficiaries and user groups to determine the willingness to pay for and/or maintain rural road improvements and transport services.

Survey questionnaires: Distributed to key service providers and transport operators and distributors to understand the nature of their constraints in service delivery and to establish an estimation of the level, frequency and quality of service resulting from road improvements.

User surveys: Intended to obtain representative data at a household level. Includes demographic and economic data for the household, transport use and satisfaction, trip lengths and times, transport costs, and priorities for improvements.

Participant observation: A fieldwork technique used to collect qualitative data and to develop in-depth understanding of people's motivations, perceptions and attitudes. In-depth participant observation can reveal the influences on people's preferences and can lead to a better understanding of their constraints and incentives.

Participatory stakeholder workshops: Conducted with beneficiaries and key stakeholders to present findings of surveys, focus group discussions and interviews; to establish and agree on priorities in a transparent manner, and to achieve consensus around project objectives. An output of this workshop is to recommend how to incorporate stakeholders' priorities and perceived constraints into project design.

We need to prepare a critical review of all the above methodologies in terms of their usefulness, strengths and weaknesses in integrating social impacts successfully. A comparative statement of various studies based on these different methodologies needs to be prepared for further development of a rational methodology.

The India State Highways Program¹⁴ has developed an approach where displacement under the project will be limited to the corridor required for the road and its safety zone. This corridor of impact is defined as the full construction width plus a safety zone of one meter on either side. This varies depending on area, but is typically 18 to 20 meters. Within this corridor, there cannot be any structures or other hindrances. The advantage to this approach is that such a corridor is easier to maintain free of encumbrances than the full right of way (ROW). Since the density of structures and other encroachments is not very high close to the road, the need for resettlement is reduced to less than a quarter of what would be required if the entire ROW were to be cleared – with corresponding savings in cost and efforts. Through consultations with the project authorities and government officials, agreement has been reached that those outside the corridor of impact but inside the ROW will not be displaced during the project period.

While this solution constituted a compromise in very difficult discussions about how to deal with squatters and encroachers, it should be recognized that the approach offers only a temporary solution. It does not adequately address the Government's longer term needs of maintaining the right of way clear, nor does it provide squatters and encroachers with the security of tenure needed to improve their lives. Attempts are therefore being made within the context of the project to investigate and attempt to achieve more permanent solutions, such as facilitating access to credit or other ways for squatters and encroachers to obtain security of tenure.

For monitoring and evaluation, a social assessment:

- Establishes baseline conditions in select communities in order to allow for a comparison of pre-and post project benefits and to enable the measurement of the magnitude and direction of change. Baseline surveys should contain gender-specific information regarding *land holdings* (distinguishing between owners and tenants), *agricultural production*, *household incomes*, *health conditions*, *education levels*, *employment*, and other socio-economic data.
- Identifies a set of social indicators against which the benefits of transport investments can be measured. Benefits may include enhanced accessibility, time savings, reduced travel costs, increased incomes, increased enrollment rates, number of visits to health and other social facilities, and the proportion of on-farm and off-farm employment created.
- Develops mechanisms for participatory monitoring of social development objectives. Monitoring activities systematically seek feedback from main stakeholders involved in the project concerning project benefits. Basic attitudinal and beneficiary surveys can be used to gauge any changes in attitudes, needs, and expectations of key stakeholders. Such monitoring can provide vital feedback to the client regarding project implementation in addition to flagging potential problems at local levels.
- Monitors the distributional impacts among different socio-economic groups with respect to income distribution, access, gender, safety, land-use and values, and spatial

impacts. This provides a better picture of who benefits and how well the poor are reached from transport investments. It develops impact indicators to measure the development impact, magnitude, and direction of social and economic change resulting from the project intervention. Results of this change should be gender disaggregated.

Monitoring and evaluation contributes to a better understanding of poverty, enables better and more effective targeting of the poor and vulnerable, maximizes user/stakeholder participation, and can draw attention to the complementary investments needed to support the intended objectives and impact of transport projects.

Beyond simply determining the criteria or benchmarks for measuring whether project benefits are reaching the targeted stakeholders, monitoring and evaluation processes should serve as feedback mechanisms. Process indicators that monitor and evaluate operation and maintenance should be specified in addition to adjustments required to meet the needs of beneficiaries, user groups, and service providers more effectively identified.

There should be specific points in the life of the project when the results of monitoring are used to introduce modifications into project design to take account of changing circumstances or new information. The mechanisms for doing so should be built into project design from the beginning.

In the case of more general social analysis, which is designed to provide information concerning the social landscape and the most effective ways to foster sustainable development, the monitoring of social change should also be carried out on a consistent and ongoing basis. The results of this monitoring should feed back into the development of social policy that in turn should be integrated into economic and development policy in general. In this way, the ongoing monitoring of social groups and how they are changing will inform development policy.

Wealth and income distribution: Although all groups are better off in most cases, the wealthy seem to derive more benefit from rural road provision than do less advantaged rural dwellers. Research conducted in Kenya concerning the distribution effects of future roads found specific cases of economically powerful truckers, traders, and farmers who could be expected to benefit disproportionately relative to their numbers in the overall population. Also, land tenancy patterns are important considerations in assessing distributional impacts. Location of households with respect to new roads also causes differential effects: those living nearest roads benefit from increased land values, cash cropping opportunities, and reduced transportation costs, while those living farthest from the roads may find themselves relatively worse off. Therefore, in conjunction with road construction programs, complementary and targeted programs are needed to enable the poor to exploit benefits from improved access and infrastructure.

Gender impacts: Activities affected by road access and availability are gender specific and the services provided through roads are accessed and utilized differently by women and men.¹⁵ Investigating gender differential impacts in a context characterized by female-headed households was of critical importance in the Kenya RARP. Furthermore, the baseline survey revealed distinct disparities between male-headed and female-headed households, particularly with respect to greater wealth, ownership of land, level of

economic activity, and consumption behavior. While female-headed households are able to meet their subsistence needs, their agricultural productivity level and overall income stream fall below those of male-headed households. The following gender differential impacts were noted in the Rural Impact Study with respect to these variables:

- Farm inputs and outputs: Male-headed households increased their agricultural inputs, outputs, and income at a more rapid rate and hence were able to increase farm earnings more than female headed households. Women are less involved in higher value and cash crops.
- Non-farm activity: Female headed households showed a greater increase in both non-farm and total earnings than male headed households.
- Wage opportunities: Women were found to be seriously underrepresented in the RARP labor force, and hence excluded from accessing and benefiting from income-earning opportunities.

Regional growth inducement may result in impacts that are not only adverse to the community, but also can adversely impact the transportation investment. Imagine the following scenario:

1. Buildings are constructed in the planned future right-of-way of a proposed roadway, foreclosing opportunities to widen or interconnect roads where needed,
2. Thoroughfare frontage is strip zoned for commercial use or subdivided into small lots, with little attention to access control,
3. Poorly coordinated access systems force more trips onto the arterial;
4. Traffic conflicts multiply,
5. Crash rates rise,
6. Congestion increases,
7. Roadway improvements are needed sooner than expected, and
8. The cycle begins again, only structural improvements along the roadway have now increased the cost of future right-of-way and the ability to provide needed roadway capacity.

This counterproductive cycle reduces the life of a transportation facility and increases the potential for adverse community impacts. Conducting a community impact assessment can help raise awareness of these issues and local support for a more effective and coordinated transportation and land use planning process.

Conclusion

Social dimension is an essential dimension. This means meeting the needs of captive users, other wise formal designs of highways and urban systems are violated. Assessment of benefits and costs must take into account the cost of ignoring the needs of people who do not have choice of either switching to alternate modes incase of restrictive measures or relocating themselves in case of highway limiting their access. A detailed critical review of social assessment methodologies is required to understand their limitations and usefulness. Social audit procedure needs to be developed like safety audit of transport facilities.

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