

SOCIO-ECONOMIC IMPACT OF RURAL TRANSPORT INTERVENTIONS AND POVERTY ALLEVIATION

Professor John Howe

Objectives of the paper

Abstract

In considering rural roads and poverty alleviation it is useful to consider the following issues:

- a) How do we assess the impact of road investment on rural development?
- b) What are circumstances in which road investment is most likely to have a positive post investment impact?
- c) How have the rural poor benefited from the subsequent development?
- d) How can the poor benefit from labour intensive road construction programmes?
- e) How should the planning and funding of road investment and maintenance programmes be organised to help the rural poor?

Besides road investment and maintenance are there other issues and complementary policies which need to be addressed and implemented to ensure the poor gain the maximum benefit from road investment?

Key issues

- Road impact studies provide very mixed results. They cover a wide range and type of road investment in different geographical environments. Care must be taken in interpretation. The scale in change in transport costs will usually be critical in assessing impact.
- In general road investment should be seen as enabling development to take place rather than as a catalyst to development. The poor often do not benefit greatly from road investment and they are frequently ignored in the road planning process. Although the poor do not travel frequently they still have need of basic access to markets and social facilities like hospitals that needs to be addressed. Well-organised labour intensive road construction and maintenance programmes are an important way that the poor can participate and benefit. The engineering solutions of road investment and maintenance need to be supplemented with policies to address other issues such as transport services and Intermediate Means of Transport (IMTs).

Key topic areas

- The development impact of roads
- Roads as a catalyst to development or as enabling development
- The impact on the poor
- Labour intensive construction, road maintenance, planning and funding road investment and maintenance, social and economic needs, transport services.

1. INTRODUCTION

The socio-economic changes associated with investments in transport infrastructure in developing countries have been subject to intensive scrutiny for almost four decades and there are a number of summaries of findings (Devres 1980, Howe and Richards 1984, Ahmed and Donovan 1992, Creightney 1993, and World Bank 1994). A related literature has focused on the socio-economic changes associated with general public works programmes that include investment in roads, in which characteristically emergency relief and employment creation have been the major objectives (Ravallion 1990; von Braun, Teklu and Webb 1991, Keddeman 1997). The focus on poverty alleviation has both a more recent origin and restricted literature. This mainly deals with the topic indirectly - through proxy indicators such as household income, agricultural production, and wage rates - rather than 'poverty' in the sense of the incidence of deprivation, and changes in deprivation, of basic needs and services. Also, poverty indicators have usually been treated simply as a sub-set of general socio-economic changes.

Due to variations in the scope of the enquiries, definitions used and methodological differences, the outputs from these literature sets offer a confusing collection of findings and opinions, with respect to the road sector. This is due, inter alia, to: (i) investigators combining experience from major highways and minor road projects; (ii) uncertainty as to whether the projects compared represent new or rehabilitated routes; and (iii) the generalisation about the experience from different continents. In respect to (iii) there is a notable Asian bias to the literature, where conditions differ markedly from South America and, to an even greater extent, Africa. Thus, to bring clarity to the present discussion on poverty alleviating impact of rural roads it is necessary to define the discussion's scope, the reasons for interest in the topic, and the terminology that will be used.

2. ASSESSING RURAL ROADS IMPACT ON GROWTH AND POVERTY ALLEVIATION

The development of models to predict the socio-economic changes resulting from investments in road infrastructure have been something of a holy grail. While a number of attempts have been made to formulate general relationships, these have not been successful. In fact such models are unlikely. The reasons for this seem to be poorly understood, although they were set out more than two decades ago (Wilson, 1973).

2.1 Wilson's 1970s model: the 'enabling environment'

The findings were the result of extensive research conducted by the Brookings Institution on behalf of United States Agency for International Development (USAID) (Fromm 1965, Wilson 1965, Wilson et. al. 1966). They discounted the strategic, or catalytic, view of transport investment: "Transport investment is no more an initiator of growth than any other form of investment or deliberate policy. Under some conditions, it may turn out to be strategic but the same can be said about any specific investment or policy" (Wilson, 1973). Restrictive conditions were delimited under which investment in roads could be expected to precipitate growth. These were based on the premise that the observed variation in the results of investment could be explained by differences in two main factors: (1) the creation of economic opportunity; and (2) the response to economic opportunity. The first was thought to depend primarily on the quality and quantity of resources in the regions served, the actual change in transport rates and service, and commodity price levels. The second on an awareness of opportunity and 'attitudes toward

economic change’.

In the common situation where a road opened up new territory, the soil or forest conditions in the area determined not only the type of activity, but also much of the increase in output. With improving yields or rising prices, reduced freight rates merely provided a further stimulus. The new transport capacity was permissive and responsive rather than causal. However, the magnitude of the additional stimulus provided by transport was thought to vary inversely with rate levels. In common with much other research, entirely new routes were found to have more numerous and larger effects than rehabilitated or improved roads.

In respect to this aspect the essential question is: ‘under what circumstances and to what extent will economic opportunity be exploited in such a way that net output per capita rises?’ Additional transport capacity generates new opportunities for pecuniary gain. Observation suggested, however, that there was no apparent consistency in the extent to which such opportunities were seized, or in the apparent consequences. The creation of economic capacity is only permissive. Effective utilisation and augmentation require attitudes, abilities, and incentives that cannot be taken for granted in most underdeveloped economies.

One of the main factors influencing the response to new transport capacity was awareness of its potential, which obviously depends on the number of people directly influenced. This favours densely populated areas, which tend to be those of greatest agricultural potential.

Wilson drew two important conclusions concerning the implications of continuing existing transport investment policies with their emphasis on road infrastructure. First a positive response could only be expected in areas in which a ‘prior dynamism’ existed. If a particular region is growing rapidly in terms of population, output, and so forth, the probability is very great that existing transport facilities will soon constitute a true bottleneck even if there is some excess capacity at the moment. The existence of overall dynamism implies, *inter alia*, an environment in which economic opportunity tends to be sought and quickly exploited when found. By definition this is not normally a characteristic associated with areas in which poverty is prevalent on a significant scale. Second, one of the important ingredients in inducing increased production is often a sharp reduction in rates usually associated with an expansion of vehicle capacity. In other words, the coming into existence of a highly competitive motor transport industry is the mechanism whereby cost savings are passed on to producers.

This aspect of transport investment has been systematically underestimated. Experience shows that the emergence of competitive rural transport services cannot simply be presumed to follow road construction (Carapetis, et. al. 1984). This has especially been the case since the 1980s when most of the low-income countries experienced real stagnation or decline in their goods vehicle fleets, under the foreign exchange rationing imposed by the oil price crises of the 1970s. The reality is that the rural areas became a market for the ‘sellers’ of transport services not their buyers (Howe, 1995).

Wilson’s limiting conditions of ‘prior dynamism’ and ‘a competitive motor transport industry’ imply that relationships which seek to model changes resulting from investment in rural roads will necessarily be highly local and therefore difficult to establish. A similar conclusion was reached as the result of efforts to develop such relationships for Southeast Asian conditions (Louis Berger Inc., 1979). The study referred to ‘mediating variables’ which act as constraints on the magnitude of the response of different rural

areas to accessibility change. The sheer number of these - more than 30 in all - indicate the impracticality of the modelling approach to forecasting socio-economic change and the resultant effects on those living in poverty.

2.2 Changing context of road investment and growing significance of labour-intensive works for poverty-alleviation

In assessing impact it is important to appreciate the phases through which the rural road sub-sector has developed in the last few decades. The 1960s and 1970s witnessed significant expansion in the rural road networks of many countries, often linked to the exploitation of major cash crops - tea, coffee, sugar, wheat - or areas of potentially profitable smallholder agriculture. The impact reviews conducted for USAID (Devres Inc., 1980) and ILO (Howe and Richards, 1984) are representative of the findings from this period.

The early findings, which relate mostly to new road construction, broadly agreed with Wilson's conclusions (Devres Inc., 1980, Howe and Richards, 1984). There are examples of positive, nil and negative socio-economic changes. However, in respect to distributional aspects, reflecting the likely effect of the investments on the poorest, the findings are overwhelmingly negative - Box 1. Partly this is because income distribution and poverty alleviation were seldom considered as criteria in the selection of projects. An area's potential contribution to agricultural output was the main factor considered in the process of road selection. This can be expected to reinforce existing social and economic structures and to speed up any tendency towards increasing social and economic stratification, mainly because it would help wealthier and better-informed producers to expand faster than others. Also, the use of labour-based methods was rare giving few direct income transfers to the poor. It was also found that poor maintenance had nullified many of the benefits of road provision.

The 1980s saw the rise of efforts to promote labour-intensive methods, mainly for road improvement and maintenance, following the initial successes enjoyed in Kenya with the Rural Access Roads Programme (RARP), and Malawi under the District Roads Improvement Programme (DRIMP) (Howe and Bantje 1995). ILO now defines a labour-intensive approach as one which optimises rather than maximises the labour content of a project. The change in emphasis was intended to distinguish between: (i) the temporary use of labour-intensive methods to provide short-term employment or income generation in times of crisis, synonymous with the EIP concept; and (ii) the creation of systems, procedures and capacities for sustainable employment generation, through local-resource-based approaches in the context of longer-term development strategies, for which the term labour-intensive is now reserved. However, the improved performance with EIPs in the 1990s means that in practice it is not always possible to distinguish between the two variants.

The most immediate poverty-alleviating effect of investing in a road is the local employment created in its improvement and subsequent maintenance. If suitably targeted the poor can benefit most directly through earnings. Maximisation of these benefits revolves around whether the work activities are labour- or capital-intensive, located in areas containing significant numbers of the poor, and managed in a way that the poorest are targeted efficiently. High wages relative to those in the local economy will tend to exclude the poor and vice versa.

Box 1: Distribution of Impacts

- Those in a better position to take advantage of road improvements (landowners near the road, middlemen, retailers, truckers, urban dwellers, upper and middle income levels) will profit most in the absence of specific programmes to counteract this.
- The fundamental effects of roads is a reinforcement of the development of capitalism, widening of income disparities and concentration and centralisation of capital.
- Where there are large landholders, road improvements cannot be expected to spur production increases since landowners enjoy sufficient income and fear that additional income might liberate their employees. Land tenancy will therefore be a major factor in determining who benefits: if land is unevenly distributed, the landless or land-poor will receive little benefit, but if land is more evenly distributed, road projects will serve lower income groups better.
- Where export cash crops were most important, there was a tendency toward greater income stratification. Where domestic food crops were grown, there was greater income equity. This is because high-income farmers are most likely to participate in cash cropping, use fertilisers, extension services, and credit, and exhibit innovative behaviour and risk-taking.
- Some evidence has been found of road improvements lessening income differentials, especially when accompanied by crop centres and credit associations.
- The implication for policy makers is that road projects must be complemented by programmes to promote competition among transporters, land reform, and access to credit.

Source: Devres Inc. (1980)

Table 1 gives an approximate indication of the initiation of labour-intensive road improvement and maintenance works, but only for those under the auspices of the ILO. Some of these have since ceased. In other cases (e.g. Ethiopia, Tanzania) there have been repeated pilot and demonstration projects for more than a decade without resulting in large-scale programmes and the institutionalisation of the technology. There is a notable African bias, made stronger by the foundering of a number of Asian initiatives (e.g. Philippines and Indonesia). Although 1986-90 appears to have been the peak of activity, this is misleading because there are now few countries in which there has not been some labour-based experience.

The initiation of labour-intensive road works in the 1980s undoubtedly strengthened the poverty-orientation of the sub-sector, although the scale of change should not be exaggerated. Most sectoral investment continued to be capital-intensive, and many labour-intensive activities were deliberately located in the potentially more productive and wealthy locations. However, the conscious efforts to increase the involvement of women in the labour-based works certainly ensured that the least advantaged were increasingly represented (Bryceson and Howe, 1993).

Table 1: Initiation of labour-intensive road works in developing countries

Number of Initiatives	Period (Years)	COUNTRIES
1	1970-75	Kenya
3	1976-80	Botswana, Malawi, Tanzania
9	1981-85	Burkina Faso, Burundi, Cape Verde, Ethiopia, Mozambique, Uganda, Laos, Philippines, Thailand
13	1986-90	Ghana, Lesotho, Madagascar, Morocco, Namibia, Vanuatu, Niger, Nigeria, Rwanda, Sierra Leone, Zambia, Nepal, Solomon Islands
8	1991-95	Angola, Guinea, South Africa, Zaire, Zimbabwe, Bangladesh, Cambodia, Indonesia
3	1996-	Sudan, Eritrea (?), Haiti (?)

Source: Petts (1995), ASIST (1997)

The socio-economic effects of most programmes and projects were monitored, especially the largest in Kenya, but with generally disappointing results in respect to clear conclusions concerning their effect on those living in poverty. The findings were contentious, mainly for methodological reasons (Keddeman 1997). In general the methodological and analytical requirements necessary to establish causative socio-economic relationships have been underestimated (Cook and Cook 1990).

Notwithstanding these difficulties a recent assessment shows labour-intensive road works to be 25-30% cheaper than comparable capital-intensive methods; to employ five times more labour, which can be wage-targeted on the poorest groups; and, where new construction or major rehabilitation is concerned, to result in US\$3,000 - 5,000 per km being injected into the local economy. Opportunity costs were found to vary from as little as 10%, for women in poor isolated villages in India, to close to 100% in Thailand and in a few cases in Africa. Backward linkages were not found to be significant. On the other hand, forward linkages, defined as the spending of earnings during construction, were estimated to generate income multipliers in the range 1.5 - 2.8 (Keddeman 1997).

2.3 Rural roads as development ‘catalysts’

In the face of the caution instilled by Wilson’s work and subsequent project experience, a major study on rural roads was conducted in 1982 by the Bangladesh Institute of Development Studies (BIDS) and International Food Policy Research Institute (IFPRI) (Ahmed and Hossain, 1990) which firmly came down on the side of rural roads as a development catalyst. It has been widely quoted (World Bank 1990, Ahmed 1990, Ahmed and Donovan 1992, Creightney 1993) as indicating that investment in rural roads does indeed lead to a reduction in poverty, thereby contradicting the findings both of Wilson and previous empirical research (Devres Inc., 1980). The study has also been considered to hold important lessons for Africa (World Bank 1991a).

The BIDS/IFPRI study attempts to isolate the developmental ‘impact’ of rural infrastructure, in particular roads, on the rural economy of Bangladesh. The 16 villages in its sample were categorized into two groups - developed and underdeveloped - based on an aggregate index which reflected the ease of access to various services such as markets, schools, banks, and local administrative offices. Villages which had better than average access were classified as ‘developed’. The ‘developed’ villages were found to be

significantly better off in a number of areas including agricultural production, household incomes, wage incomes of landless labour, health, and the participation of women in the economy.

2.4 According to the authors:

“the most important finding is the profound effect that infrastructure has on the incomes of the poor.” Overall, estimations based on the most and least developed villages indicate that infrastructural endowment causes household income to rise by 33%: income from agriculture increases about 24%, that from livestock and fisheries about 78%, that from wages almost doubles, but income from business and industries only rises by 17%. Most striking, however, is the distribution of these increases: the functionally landless and small farmers garner a larger share of the increases from crops, wages and livestock and fisheries, while the large landowners capture most of the smaller increase in business and industries”.

This conclusion led the authors to assert that development of rural infrastructure, with roads explicitly identified as being the central component, has to play a key role in any development strategy for Bangladesh (Ahmed and Hossain, 1990). Further that (past) allocations to infrastructure have been based on experience and judgement about current or emerging bottlenecks and that this “bottleneck” approach should be replaced by conscious creation of excess capacity that would, in turn, induce production of agricultural and non-agricultural goods, services and employment (Ahmed, 1990).

The implied effects on poverty alleviation appear unequivocal in the context of Bangladesh’s development environment. However, issue can be taken with the attempts that have been made to assume that these results might be applicable to other developing countries, and the strategic investment conclusions that have been drawn.

The reason for doubting that these results can be applied outside of Bangladesh lies in the almost unique character of its environment. In summary these comprise a flat plain much of whose fertility is annually renewed by the silt-rich waters of its major rivers which inundate much of the land area for several months. This plain supports one of the most dense rural populations in the world at an average of over 800 persons per sq. km., in the range 175 – 4,200. It is able to do so because 12% of the land area can be triple cropped, 59% double cropped, and the balance of 29% single cropped (Rahman, Hossain and Sen, 1996). Due to a high proportion of functionally landless people, variously estimated to be in excess of 50%, there is an abundant service sector, especially in all forms of non-motorised transport (NMT), which are ideally suited to the ‘small parcel’ nature of most goods consignments. The NMT are indigenously produced, and are cheap and robust. With rice production - the major grain - increasing at 4%, and population at 1.8%, annually there is a continuously rising demand for transport. Thus any new road taps into both a demand for transport and a service sector willing and able to meet that need. The combination of these factors can be found in very few parts of the world, other than, perhaps, selected parts of Asia - the Gangetic plain of India, Indus basin of Pakistan, Java and China.

The BIDS/IFPRI advocacy of road investment as a strategic ‘catalyst’ - or causative factor of more general development - which should lead other investments, appears to be fundamentally unsound. Hirschmann’s work showed that much of the optimism about transport’s role in inducing development to be unfounded, and a more ambiguous scenario was posited with transport also appearing as either a permissive or lagging sector (Hirschmann, 1958).

The BIDS/IFPRI study indeed quotes Hirschmann in support of its contention for transport's leading role, but the reference is selective and not in keeping with his general arguments. He regarded the 'bottleneck' approach as the most likely and effective route to development. Investment in infrastructure, he argued, was essentially permissive, reinforcing motivations that already existed, and therefore it made sense to direct investments into directly productive activities which would lead to increased infrastructure investment once the bottlenecks began to appear. Moreover, the indivisible nature of many infrastructure investments made for costly and irreversible mistakes if the 'leading' route was pursued. For this reason Hirschmann was particularly critical of the potential for 'leading' policies in backward regions and countries which, he argued, were hardened in their reluctance to develop and so were unlikely to respond to the opportunities presented by additional infrastructural investment.

2.5 The maintenance hitch: 'disabling infrastructure' and draining investment

For earth and gravel roads, especially, there is an important and usually overlooked link between effects and impacts, and that is maintenance. If the quality of a road is not preserved by appropriate maintenance then the effect of the project inputs (e.g. road surface improvement) will be diminished such that there are much reduced, or no discernible, impacts i.e. effects are essentially perishable and have to be preserved by appropriate maintenance. Without a continuous effort to redress natural processes of deterioration and wear-and-tear the roads and associated effects will decline to their pre-investment level, undermining the possibility of long-term impacts. Worse still the dis-benefits embedded in the original improvements are likely to remain, e.g. once land is lost to the right-of-way for a road it is rarely reclaimable for other purposes.

One consequence of this relationship is that it is meaningless to talk of the socio-economic impact of roads as though this is a permanent, quantifiable phenomenon. The nature - type, magnitude, and duration - of the effects of road provision will depend on the standard of the facility provided initially, and the extent to which that standard is maintained.

The 1980s saw the issue of maintenance become steadily more prominent on the international investment agenda, such that few new construction programmes were initiated after the early years, although the momentum of some continued. Perhaps the outstanding example of the latter is Nigeria. Due to its oil wealth it initiated major rural road programmes which persisted long after its short-lived economic boom (1974-82) had collapsed with disastrous results:

After the early 1980s there was little new construction in the really poor countries due to the intractability of the maintenance crisis. Reconstruction or the maintenance of existing routes, whilst being laudable for other reasons, is likely to rejuvenate developments which reinforce established patterns of income distribution, with the exception of any benefits resulting from the substitution of labour- for capital-intensive methods. Thus, effects on poverty alleviation are likely to be muted.

The 1990s have, arguably, brought a new realism to the rural road sub-sector. A decade or more of maintenance under-funding has caused havoc and many countries face a huge backlog of major rehabilitation and maintenance (World Bank 1990, 1991a, 1991b, 1992; Republic of Ghana 1992. Sylte 1996). It is difficult to envisage much new rural road construction in the foreseeable future and some countries, notably Kenya, are experimenting with innovative spot-improvement policies as a means of spreading scarce funds further. The result will be lower rates of spending per km, but (hopefully) more

kms and people reached by passable roads.

Box 2: Aspects of the rural roads sector in Nigeria

In a seven year period the rural road network in Nigeria increased by 45% from about 75,000km in 1985 to 108,700km in 1992. However, with the decline in oil prices in the early 1980s and a rapidly depreciating currency, the GNP per capita fell from about US\$1,110 in 1982 to US\$260 in 1995. Nigeria is now counted amongst the poorest countries in SSA. Worst still inadequate road maintenance in the past has led to nearly 70% of the network being in poor or very poor condition, with currently only 5% in good condition. Most of the network is unmaintainable pending rehabilitation. This is estimated to take about 30 years and is not thought to be justified for one-third of the network. Nigeria's long-term debt was estimated to be US\$35 billion at the end of 1995.

Source: World Bank (1992, 1997)

2.6 Overall assessment

Review of the empirical findings provides little support for the view that conventional investments in rural roads are likely to have a significant effect on poverty alleviation, other than in exceptional circumstances and in the short-term through employment in project implementation. Evidence on the longer-term impacts is not convincing, but seems likely to reinforce existing social and economic structures and stratification processes (Devres, Inc. 1980, Keddeman 1997).

These somewhat negative conclusions are presented to counter the rather crude way road investment has been used in the past when viewed from a development and, especially, poverty alleviation perspective. Essentially it has been a supply-led, road-system-focused process, which leads naturally to a top-down way of planning. This tends to emphasise efficient long-distance motorised transport. A demand-led process, which is more appropriate to the movement needs of the poor, emphasises efficient short-distance and non-motorised transport (Barwell, 1996)

Nevertheless, with these provisos in mind, much can be done to improve the poverty alleviation effects of investment in rural roads. Discussion will be limited to three relatively easy to implement and important aspects: (i) enhancing the use of labour-based methods; (ii) funds allocation procedures; and (iii) promoting an 'enabling environment' through stimulation of complementary transport services.

The first aims at maximising the direct effects on the poor of expenditures in the rural road sub-sector. The second is important to ensure that poor areas are not systematically overlooked by the scramble for investment and maintenance funds, particularly given the widespread appearance of 'disabling infrastructure' arising from the 'maintenance hitch'. And the third is to seek to complement investments in rural roads by policy measures to stimulate competitive transport services. These are essential to induce longer-term effects and impacts.

3. MAXIMISING THE POVERTY ALLEVIATION EFFECT OF INVESTMENT IN ROAD TRANSPORT

3.1 Enhancing the use of labour-based methods

The track record of labour-based methods is such that it should no longer be necessary to conduct pilot or demonstration projects. Rather the onus should be on investment analysts to explain why they should not use an employment-generating approach rather than the reverse. However, it has to be acknowledged that despite the impressive results large-scale use of labour-intensive methods for rural road works remains the exception, and many pilot and demonstration projects have failed to attract sufficient support to institutionalise the process. Why?

The explanation appears to lie with the way many pilot projects have been set up with insufficient learning and development time as the commonest fault. Valuable lessons can be learnt from those projects which have succeeded in developing to large-scale programmes.

Drawing on the experience and analysis of the programmes in Kenya and Botswana in particular, McCutcheon has distinguished the following main reasons for their success (McCutcheon, 1995):

- (i) The programmes were long-term and supported at national level.
- (ii) There was a sound intellectual assessment of the technical feasibility and economic efficiency of using labour-intensive methods: cognisance was also taken of technological and institutional capacities.
- (iii) Technical, institutional, organisational and socio-economic aspects received concentrated attention during preliminary work, which was maintained through pilot projects, embryonic training programmes, and subsequent national programmes. Technical matters included design, standards of construction, specifications, tools and equipment, and methods of construction. Institutional matters included the decentralisation necessary for grassroots success and the centralisation necessary to plan and co-ordinate a large programme. Organisational aspects included management structures and systems (recording, reporting, controlling, monitoring and evaluation) and training. Socioeconomic aspects included wage rates, conditions of employment, labour supply, the role of women, and social and economic impact studies. Prior agreement was reached between the different parties with regard to wage rates, conditions of employment, and the role and responsibilities of the community.
- (iv) Strong organisations were established with good management systems; a balance was achieved between decentralisation and centralisation.
- (v) Training was extensive and well focused.
- (vi) There was long-term political support.
- (vii) There was long-term financial commitment.
- (viii) On balance there was good co-ordination between the government, government departments, those administering the programme, local authorities, those providing technical assistance and donors. This was facilitated by objective external advice from the ILO.

There is an important corollary: these were *not* short-term emergency relief programmes.

3.2 Funds allocation procedures

Currently many developing countries, especially in SSA, find themselves in a cruel dilemma: “while Africa is under-equipped in relation to its potential it is overburdened by the little infrastructure that it possesses” (Riverson, et. al. 1991). That is, African countries cannot afford to maintain the rural roads they already have, but these are insufficient to meet the basic needs of their people, especially the poorest. Recent surveys in Eastern and West Africa underline how seemingly intractable this problem is and suggest that among the larger countries maintenance expenditure only around 30% of requirements within the range 13 - 50% (Sylte 1996, 1997).

One approach to this problem have been appeals to the notion of a more ‘network-based’ approach to rural road planning. Kenya is about to launch a major policy shift, with its ‘Roads 2000’ programme, which embodies this concept although doubts persist as to exactly what the approach means. In the context of the present discussion it is germane to note that narrow economic interpretations will inevitably produce a biblical situation of ‘to him that has more will be given’, and the poorest will lose out.

A poverty-oriented funds allocation procedure has to confront the equity of access issue. In some areas of almost all countries, the degree to which access is provided - like the provision of schools, health and other social services - is essentially a political decision. For example, in December 1993 an appeal was issued for 2 million tons of food aid for Kenya to combat the effects of prolonged drought. This was only the latest in a long series of such appeals. Most of the aid was destined for the arid and semi-arid lands which constitute 80% of the land area necessitating an extensive rural road network and is inhabited by about 30% of the population. Whilst the provision of access to these areas may not be an economic necessity it is most certainly one no government can ignore. The inescapable conclusion is that investment funds allocation for rural roads has to be based on both social and economic grounds if they are to serve the needs of the poor.

3.3 Promoting complementary transport services

With the exception of employment in road works the various other economic and social benefits (or dis-benefits) are manifest indirectly and only if transport operations become:

- cheaper (or dearer);
- quicker (or slower);
- more (or less) frequent;
- more (or less) reliable.

Despite Wilson’s findings, there has been a tendency to assume that road investment will lead naturally, through spontaneous interventions by the private sector, to improved transport services without the need for complementary actions and government policies. This was shown to be false more than a decade ago, but little change in investment policies is discernible (Carapetis et. al. 1984, Gaviria 1991). Without a strong, competitive local transport sector the poor stand little chance of receiving other than the direct employment benefits from road works.

Changes in the characteristics of own-account operated transport or transport services, as a direct result of a road improvement, are the essential mechanism by which other changes take place. But there is no certainty that alterations in transport operations will take place. If they do not occur, for various reasons, then the socio-economic impact of road improvement and maintenance will be correspondingly diminished. In other words, the mechanisms by which the population receives socio-economic benefits resulting from

the investments in road improvement and maintenance other than those directly due to employment are missing.

For example, governments can regulate fares and tariffs, or operators can form cartels such that travel costs to the user do not change. A country experiencing a severe shortage of foreign exchange may not be able to expand the size or usage of its vehicle fleet so no extra traffic appears. Faster potential journeys can be frustrated by rigidities in the scheduling of services, or else the magnitude of timesavings may not be of any practical significance due to the short length of most journeys.

Investigations can be made into the reasons why conducive transport operations do not materialise. By focusing attention on both national and local conditions affecting the provision of cheaper, faster, more frequent and reliable services, the probability of economic and social effects and impacts resulting from rural road investments can be qualitatively assessed. The magnitude of any operational change is an obvious additional factor that influences the scale of any corresponding effects, and can be used to further modify the qualitative assessment. Analyses of this kind would provide a means of identifying key constraints and possible measures for their removal, either by complementary investments or government policies. In so doing, the chances of achieving the desired effects and impacts of rural road investments could be enhanced.

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