RURAL ROADS AND POVERTY ALLEVIATION

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JOHN HOWE and PETER RICHARDS

ROUTLEDGE

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The World Employment Programme (WEP) was launched by the International Labour Organisation in 1969, as the ILO's main contribution to the International Development Strategy for the Second United Nations Development Decade.

The means of action adopted by the WEP have included the following:

- short-term high-level advisory missions;
- longer-term national or regional employment teams; and
- a wide-ranging research programme.

Through these activities the ILO has been able to help national decision-makers to reshape their policies and plans with the aim of eradicating mass poverty and unemployment.

A landmark in the development of the WEP was the World Employment Conference of 1976, which proclaimed *inter alia* that 'strategies and national development plans should include as a priority objective the promotion of employment and the satisfaction of the basic needs of each country's population'. The Declaration of Principles and Programme of Action adopted by the Conference will remain the cornerstone of WEP technical assistance and research activities during the 1980s.

This publication is the outcome of a WEP project.

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CHAPTER 1

The Economic Context of Rural Roads

Peter Richards

1. Introduction

Do the selection criteria used for deciding rural road investment and improvement affect income distribution and poverty alleviation? The idea that they do, in fact, have a considerable impact on incomes and poverty is the hypothesis on which this study is based. The consequence, if poverty alleviation is to be one of the principal aims – if not the main aim – of rural development policies is that road selection criteria may well need to be redesigned to meet this objective. For the purposes of this study rural roads are defined as those where improving mobility between settlements is an important feature in their planning. Major new highways connecting cities and ports are, on the whole excluded, as are the improvement of such trunk roads and major new roads opening up virgin land. But within any country the number of such major roads will be low so that for most rural people it is access to a larger village or district town which is important. Planning techniques initially designed to cope with major roads, however, may well be applied to a programme for upgrading local roads.

Any discussion of roads is meaningless without a full knowledge of the type and number of vehicles they are designed to carry. Although trucks and buses, relying as they do on – usually – imported fuel, may be inappropriate for some developing countries, they are the basic form of transport for longer distances. Walking, bicycling, or the use of animal carts, are rarely attractive for journeys over a few kilometres. Thus road selection criteria are developed with the general objective of improving physical access for farmers or villagers to a road network, which is capable of carrying trucks and buses. Furthermore, criteria are usually formulated with goods transport in mind, thus giving an inevitable bias towards areas and producers with the largest marketable surpluses. It is here that the settlement pattern of the region becomes important. Are areas of surplus production also likely to be densely populated? If not, then criteria based on goods traffic specifications may be plainly inegalitarian in their effects. There is little doubt that in some of the densely populated but poorer states of India, for example, this has happened. In Egypt, on the other hand, a high density of population seems to coincide geographically with the existence of a marketable surplus. Much then clearly depends on the nature of agrarian relations in any major area.

Few countries follow explicit criteria in upgrading rural roads. A footpath becomes a cart track and later becomes a road. This development may be quite spontaneous. But government intervention may also be involved and when this occurs a choice has to be made between different claimants. And this choice may not be made according to explicit criteria; however, official statements frequently indicate that 'development potential' (which usually means the capacity to produce a marketable surplus) is a major factor to take into account.

We cannot, however, simply plead for the use of some form of social cost-benefit analysis in rural road planning so that the benefits accruing to each income group are weighted in some fashion inversely to that group's position in the income scale. Some road programmes may conceivably have negative benefits for the poorest groups. To quote Lord Balogh (1972)[1] in a similar context it is precisely those data – a recognition of the pattern of the distribution of benefits – which are most needed for such an excercise and that we most lack. An understanding of the interaction of road construction and improvement with other socio-economic factors in rural development is what we must aim to achieve. In that way we may know what to expect and perhaps we shall be able to anticipate the consequences.

2. The Economic Function of Transport and Mobility

Personal mobility and the transport of goods are part and parcel of everyday life. Economic development both demands and permits more of such movement particularly as specialised production methods are increasingly adopted and personal incomes rise. This study will attempt to specify how and whether the provision of more and better rural roads will affect (one hopes diminish) rural poverty. But personal mobility and goods transport have always existed; thus expanding a road programme is not adding a new dimension to development. A road may be a new physical entity but the consequences of building it can only be the further development – although perhaps on a major scale – of already existing forms of social and economic behaviour.

The utility of road programmes lies in their contribution to the reduction of both mobility and transport costs. The function of a road is, above all, to carry wheeled transport. Where poverty reduces the local demand for mechanized transport to nearly zero and where there are few animals to draw wheeled vehicles, the best-engineered road in the world will have little more merit than a footpath. But if rural productivity is high enough to generate effective household demand for truck and bus transport, then the effect of transport cost reductions may be colossal. Even the cost of animal drawn transport can be considerably reduced by better road maintenance and improved road surfaces. But since animal drawn transport is not likely to be used for long distances (if only because of difficulties in arranging for the supply of fodder) the dominant role of rural road programmes must be that of bringing access to mechanised transport closer to the home or, through the construction of all-weather roads, allowing access for a longer period of the year. In any instance the impact of rural road programmes is likely to be greater the more transport costs are reduced. Furthermore, the socio-economic effects of achieving a vast change in mobility and goods transport habits over a short period of, say, five years rather than achieving the same change more gradually over 20 or 30 years, may themselves be widely different. However, schematically and for the present purposes of understanding the role of mobility and transport in economic development, rural road programmes will be equated with a reduction in transport costs.

In the flourishing states of pre-modern times rural road programmes – in our sense of transport cost-reducing investments – had perhaps four major consequences. The first was to facilitate the imposition of law and order. The intention was to connect strongpoints and to allow disciplined and compact bodies of men to be moved around the country (usually on foot) as speedily as possible. Administration and justice might then follow but physical control was the first priority.

The second consequence was specialization and hence trade. This was on a fairly small scale and no doubt mainly concerned handicrafts and luxury items. Brass pots and pans and some textiles were common products and human porterage the normal method of transport. Rural communities no doubt continued to be largely self-sufficient – not only in food but in other household items. Some agricultural specialization and trade in agricultural products, particularly between different climatic regions, was certainly also encouraged – the sale of clarified butter by the hill villagers to the plain areas of Nepal, the Terai, is a modern example of this.

The third consequence was the stimulation of population movement. Naturally the movement of goods would have been unlikely to have taken place independently of owners or producers. Of course, exodus from rural communities to establish new settlements, or to escape onerous feudal exactions, took place with or without a road network. Improved mobility, however, encouraged temporary movement and continued contact with home settlements. Presumably, it also improved the possibility of finding paid work outside the village in areas with different seasonal labour requirements and may, in that respect have hastened economic stratification within rural communities. No doubt specialization in services and trades through itinerant barbers, tailors and other such tradespeople was also encouraged. Under these circumstances personal mobility was no doubt every bit as important as the movement of goods.

The final consequence of such early road programmes was that they no doubt stimulated urban development by permitting the transport of surplus grain crops from rural to urban areas. These surpluses came partly from high land rents and partly from favourable terms of trade for urban produced goods. Towns, which were the seats of local potentates with a large number of camp followers – and hence specialized handicraft production – would require quite considerable importations of staple foods as well as of animals.

The integration of more countries into the world economy and the effects of the industrial revolution changed this picture in two major ways. Rural road programmes acquired further important functions. The first was to help meet the demand from Europe and North America for agricultural produce, fine and coarse fibres, oils and tropical beverages, rubber and some foodstuffs. This demand continues and has, in certain ways, grown. Animal forage, for example, has been added to the list. How this momentous increase in demand impinged on levels of rural poverty and intra-community relationships varied greatly according to different organizational forms, and the climate and fertility of different subregions. Plantation agriculture, necessarily, had different social effects from smallholder production. In Africa, particularly, the production of export crops is still an important engine of growth. Road expansion can generate increased production for the export market so that the issues involved in integrating today's developing countries into the world market are still live.

The second effect of economic integration was to open these countries to imports of mass-produced consumer goods – the very same textiles and pots and pans in which urban producers had previously specialized. The losers from these manufactured imports were those same urban artisans and those involved in incipient urban capital goods industries. Some rural purchasers, however, may have gained and it is possible that production of basic household utensils produced within the village was not threatened. Thus, the process by which former artisans were likely to have been transformed into workers in search of wage employment can be seen.

Today many governments are just as anxious to expand domestic food production as to stimulate the further export of agricultural produce. Growing urban areas need to be fed. Mass-produced consumer goods are now rarely imported. National urban centres have revocered their earlier position in manufacturing. A far greater integration of rural and urban areas through trade is being achieved – an integration which now is based on the use of mechanised transport.

The need to raise output of domestic food crops is being given direction and assistance by the developments which have occurred in agricultural technology. These include both mechanisation – whether of operations such as land preparation, threshing and irrigation – and the use of chemical fertilizers. All these activities require bulk transport. A further factor, the improvement of seed stock is also dependent on transport, but on a much smaller scale. Most of these inputs are themselves the output of manufacturing processes. Urban based manufacturing is also increasingly destroying most rural-based crafts, trades and services. Ready-made clothes drive tailors out of business as plastic buckets may well do potters or basket weavers. Rural road programmes necessarily hasten this process, although where purchases are intermittent, a series of irregular visits on foot to a trading post will be sufficient to introduce such goods into the village. That the goods are cheap is enough to achieve their full acceptance.

Thus the effects of such changes can be summarized as moves away from village level subsistence, whether in handicrafts or food, and towards greater specialization between urban and rural areas, and within rural areas so far as different crops are concerned. This can be seen as increasing commercialization or modernization of agriculture. This modernization is often the explicit or implicit objective of rural road programmes. Here we must reiterate that our interest is in the poverty alleviating effects of rural road programmes. If these programmes lead to the modernization of agricultural production that may give us a helpful lead in our analysis, but it will not replace analysis.

There are other factors at work as well. Three other major consequences of transport cost reduction are apparent and these may have poverty alleviating effects which are quite contrary to those implied by the processs of agricultural modernization. The first is that of migration for employment, whether from rural to urban areas or within the rural sector. (Migration here refers to movement of certain family members, not to a once-for-all shift of a whole faimly.)

Increased personal travel for social and leisure purposes is the second consequence. The importance of personal travel has usually been somewhat understated in relation to goods transport, partly because of the difficulty of integrating it into a national income accounting framework or perhaps because of a reluctance to tax travellers. Nonetheless, rural road programmes frequently stimulate very considerable personal mobility.

The third consequence is that of increased travel for educational and health care purposes.

So far it appears as though the effects of rural road programmes will be the same in whatever environment they are introduced. Certainly, in major respects, these effects must be the same. However, there are four points, in relation to the physical location of rural road programmes, which should be borne in mind. First, the average level of productivity and of incomes in the region or, if the area is uninhabited, its fertility in relation to that of other areas. Second the degree of population density. This will be very important in defining the process of modernization. Third the availability and traditional use of draught animals, which determine the extent of the jump in technology that access to wheeled and mechanized transport will imply. Fourth the remoteness of the area from urban and industrial centres. Road programmes, by necessity will reduce some of the costs of remoteness and bring nearer and closer localities onto a similar footing. But remoteness can never be completely overcome.

Finally the theoretical means by which poverty can be alleviated are discussed. In this study poverty is treated as an absolute concept. The poor are those below a certain threshold, generally defined in terms of income. The level of that threshold is assumed to have remained constant during the period of analysis. The extent of rural poverty can then change because of any one – or a combination of – the following four factors.

1. Changes in (income) distribution within the rural (agricultural) sector because the purchasing power accruing to a unit of one factor of production (land/labour) has changed relative to that of the other.

2. Relative changes in the purchasing power accruing to certain individuals within each class, defined by ownership of factors of production, (i.e. bigger and smaller farmers).

3. A change in total sectoral net output with internal distribution unchanged.

4. An increase or decrease in the command over goods and services produced outside the sector of a stable net sectoral output, i.e. shifts in the terms of trade between the agricultural and industrial sectors.

Road programmes can, in principle, work on any of these four factors. They may aid in increasing rates of return to land while opening up village jobs to competition from outside labour. They may allow larger farmers to reap benefits which smallholders cannot afford.

They may, of course, raise total rural output with distribution unchanged. Finally, they may so increase the integration of rural and urban areas that their vulnerability to price shifts is greatly increased. Higher oil prices, for example, may turn the internal terms of trade against the rural sector while faster urbanization may raise relative food prices.

3. An Example of the Analysis of Road Programmmes: Nepal

Some interesting[2] literature has been produced on the effects of the construction of major highways in Nepal. The roads in question, which connected major towns within the country and with the Indian border, cannot be called rural roads within the normal meaning of the phrase and were and are more in the nature of trunk roads. In a sense these roads are a historical anomaly caused by Nepal's self-imposed isolation before the 1950s. Thus some of their major effects have been those mentioned above, namely the penetration of local markets by foreign, (Indian) goods and some destruction of local manufacturing. Personal mobility has been considerably stimulated by the availability of bus travel, particularly as an alternative to the porterage of small head loads. The administration has achieved the potential for quick travel within the country. And provincial towns have acquired an administrative presence and hence considerable cash income.

But the major positive impact that was expected from these new roads, in both the Hill and the Terai areas of Nepal, has failed to develop. As Blaikie, Cameron and Seddon (1977)[3] write:

> The roads have served to encourage agricultural imports rather than exports. The adoption of new technologies has been very limited. No new crops have appeared. The move towards increasing subsistence because of population presssure outweighs any local commercial development, and public administrative services have been limited and ineffective.

As the authors point out, the provision of major roads is just not sufficient to alter the pace and pattern of Nepal's development or, as an earlier ILO report put it, Nepal's daily impoverishment.[4] Government machinery is not organized to support peasant agriculture and poverty is so great that farmers cannot risk innovation.

In the southern Terai areas the situation is somewhat different. While major roads have allowed more forest areas to be opened up, their absence in the past was by no means always a constraint to development. Furthermore, the difficulties of modernizing Terai agriculture are more those of defective government machinery and of general disincentives to reinvestment in agriculture. The authors comment: 'Even within Nepal there are opportunities in commerce, transport, education and smuggling which do not encourage a deepening of capital within agriculture. Road development only serves to make these alternative opportunities more attractive.'[4]

The approach of these authors to the analysis of the effects of the construction of a major new road network in Nepal expands upon the approach discussed in this introduction. Trends within the national economy are identified as pointing clearly in one direction ('the crisis' in Nepal). The network of major roads has done little to arrest the trend and may, indeed, have intensified it. Like many welcome initiatives, this development promised (or many observers thought it promised) much more than it could sustain. But, of course, the severity with which the road network can be criticized must be in direct proportion to the claims which were made earlier for it. There is also little criticism of the existence of the roads as such, although it is suggested that their alignment could sometimes have been improved. Nepal would not necessarily be better off if major urban centres were not linked to each other and to India since an almost inevitable process of economic deterioration could hardly be arrested.

4. Roads and Agricultural Modernization

In this section we look at two major developing regions, Africa and Asia – particularly South Asia – and ask how rural road provision appears to have affected the process of modernization; and, furthermore, how roads and modernization may have affected poverty.

Africa. To speculate briefly on the likely consequences for poverty alleviation of processes of modernization in Africa (south of the Sahara) is rash. Furthermore the nature of the contribution of road investments and lower cost mobility (and transport) to modernization is not clear. However, to justify the analysis of road programmes in terms of agricultural modernization we do not need to invoke the relatively strong, and frequently doubtful, assumption that road investments were always planned with an eye on material costs and benefits. A weaker and more plausible assumption can be accepted, namely that on a geographical basis, district for district, the distribution of expenditure on road investment followed the general level of economic activity, average productivity and average incomes. The second assumption is quite sufficient to support the association of road programmes with agricultural modernization.

'Modernization', it may be noted, is sometimes a misnomer in this context. Many African economic success stories, such as the agricultural performance of the Ivory Coast or Malawi, are based on the application of relatively well-known techniques to increased amounts of land.

However, yield increases are nonetheless usually positive although slight. But the differential returns to land from producing export crops and producing domestic food crops (mainly maize or millet) are still usually far more important in affecting an area's productivity and income than would normally appear to be common in Asia.[6] When this consideration is added to an awareness that (at least in East and Central Africa) export cash cropping was controlled by colonial governments and permitted only in certain areas and for certain privileged groups (e.g. Buganda[7]) it is clear that the opportunities given to the spread of export crop cultivation after independence would have major socio-economic effects in rural areas. Just as European settler agriculture in Africa needed labour, which was one reason for restricting smallholder export crops – so that cash needs had to be met by selling labour – so do the larger and more successful peasant exporters. This demand for labour, coupled with inhospitable conditions in large regions of many countries, would appear to have caused considerable labour movement, mostly of a once-for-all nature and often across national boundaries.

The different fertility of regions within countries in Africa, which many writers refer to, is often mentioned as a cause of economic inequality. Land was freely available for members of various groups, but often only on onerous terms for outsiders. Better land became more sought after and inequality in its distribution increased. Some fertile land was, in any event, used for large-scale settler farms and this pattern often continued after independence. However, it would appear that even in land-plentiful areas, such as in many parts of Zambia,[8] as population has increasingly concentrated in settlements where they can make the best use of social services, so rights to neighbouring land have acquired a monetary value. At the same time shifting cultivation is still practised in areas further afield. In such examples a fairly high density of population may still be associated with low average income levels. In other areas, parts of West Africa for example, population density may well be positively related to income levels.

The general picture for tropical Africa is that outside pastoralist areas, as in the Sahel and in the south, e.g. Botswana, few animals were, or could be, used for draught or cultivation. Oxen, of course, were used to some extent in East Africa but they were, no doubt, prohibitively expensive for peasants. As a result, there was little intermediate transport technology available between head-loading (and in Ghana, apparently 10 per cent of produce movement along feeder roads – measured in tonmiles – is still by head-loading[9]) and the use of trucks. The agricultural surplus which truckable roads could carry is likely to be generated for two main purposes, either for export or for supplying urban food and fibre needs. What are the distributional consequences of an expansion of those two likely to be?

In West Africa export crop production is likely to be associated with a greater degree of inequality and of stratification in land-holding than is domestic food production. Shifts from one to the other may well increase inequality. Of course, poverty in an absolute sense may well be reduced, especially when the income position of labour moving from semi-arid areas is considered. Such movement may nonetheless contribute to real wage stagnation for existing rural wage labour. Export tree crops can, in principle, be cultivated on any holding size. In fact, because smaller growers also have food crops, the bulk of exports comes from larger holdings. Furthermore, extension advice and the distribution of new seeds, for example, which is often organized on a more or less commercial basis, is usually likely to benefit larger-sized holdings first and most. The same general picture applies to the field crops grown for export in East and Central Africa and a concentration on 'bigger' or 'progressive' farmers is often a stated national objective as, for example, in Malawi and, earlier, in Kenya.

Surplus production of domestic foodstuffs differs from export production to the extent that land fertility and location is usually less of a constraint on production. However, it is in this context that Elliott (1980)[10] discusses the difficulties faced by subsistence farmers in Zambia in starting up production for the market. Such production requires the adoption of expensive and risky new techniques and inputs where a failure in one element may jeopardize the value of expenditure on the others. Furthermore cash needs can only be met by wage employment, which may conflict with home farm labour needs. Many governments meanwhile clearly see no realistic prospects for the bulk of small peasants being able to supply urban food needs and thus prefer to trust, and assist, larger farms. In these circumstances it may be that modernization by strengthening the need of the poorer peasants for cash in hand has worsened their absolute position because no credible compensating assistance to increase their output has been given.

South Asia. This section continues the discussion of agricultural modernization and road programmes. It reviews a number of 'stylized facts', anchored in descriptions of developments in India, relevant to the effects of agricultural modernization on poverty alleviation. What is valid for India does not necessarily apply elsewhere. In other Asian countries land scarcity may not be so acute while non-agricultural employment opportunities are often growing faster. Nevertheless we can start with an image of a labour-abundant agricultural sector with a relatively unequal pattern of land-holdings distribution. Modernization in this context means the application of mechanization to traction and to irrigation and the application of chemical fertilizers and improved seeds. As noted earlier, the use of these modern methods need not require a truckable road running up to the farmstead since animal carts can cover the last few kilometres. Modernization in this sense has often led to considerable increases in output and revenue per hectare, partly through higher yields or improved varieties, partly through multiple cropping with the same crops and partly through diversification into, either higher value crops, or crops suitable for the interstices in earlier cropping patterns.

There are two questions to pose next. The first concerns the relation of this modernization to improved transport links and the second, the consequences of modernization for poverty alleviation. In other Asian countries, in other areas, large output increases have been achieved without the benefit of mechanized transport. Japan, from the late nineteenth century to the pre-Second World War era, would be the obvious example. Improved cultivation methods (using locally available organic fertilizer) were adopted which did not require large bulk inputs. Furthermore in the early twentieth century the increase in silk-worm cultivation provided a labour intensive, valuable and lightweight crop. But present-day improved cultivation methods revolve around new seed varieties requiring major inputs of, usually, chemical fertilizer in order to give of their best. In this respect cheap transport is more important than it was. Mechanized irrigation requires either electricity link-ups or the transport of diesel fuel. Both are likely to be closely linked to road availability. Finally, the use of tractors is often not considered essential to yield increases and is frequently viewed as unnecessarily labour-displacing. However, tractors may well play a land-augmenting role. Tractors might be viewed, on the one hand, as road substitutes because of their ability to cross rough ground. In fact they are probably complementary to roads because they can be easily used for commercial haulage[11] (and their purchase price may well be subsidised relative to trucks). Road expansion may on balance, therefore, favour tractor usage and thus have some labour displacing affects.

Turning to the second question, stylized facts suggest the following. In agriculturally modernized areas where both yields and cropping intensity have risen there is little doubt that real gross (and probably net) income per hectare has increased significantly faster than the rate of growth of real per capita GNP.[12] However, real wages have not done so and in some areas over some periods have fallen.[13] In the Indian context there is little doubt that the major means of alleviating poverty must be through increasing the demand for hired labour and thus raising the price of labour relative to capital. Naturally there are many poor households cultivating small areas of land (and selling some labour) and in principle their income from cultivation could be raised. In addition, there is evidence that returns to scale in modernized wheat