

# **Chapter 5**

## **Summary of Findings and Recommendations**

### **5.1 Introduction**

The study was undertaken based on the premise that rural roads are essential for sustainable development. In this broader context, it examined the policies, institutional arrangements for rural roads, and their linkages with production processes at policy, programme, and project levels. The main findings, along with the problems identified at various levels, are summarised in this Chapter. Based on the findings, some policy and programme level recommendations and suggestions are made for the development of environmentally friendly rural road programmes for sustainable development.

### **5.2 Summary of Main Findings**

#### **5.2.1 Policy Level**

In the conventional literature, and also in practice in Nepal, rural roads are defined as district- and village-level motorable roads providing access to higher level roads or market places. But, given the difficult terrain in the hill and mountain areas of Nepal, there are technical, financial, and environmental limitations to the extent to which motorable roads can and should be constructed. Therefore, in this study the concept of rural roads is defined as a way of providing access to markets in order to realise the development potentials of an area. The definition includes track, mule trails, and suspension (wooden) bridges that are connected by rural motorable roads, which in turn connect to feeder roads and highways. Such combinations would become a 'rural road network'. While designing rural roads, among others, greater attention should be given to minimising the damage to the environment, as the alignments of rural roads are likely to pass through village settlements. Since various types of rural road are interconnected, the economic benefits from the rural road network are also likely to be interdependent.

In the Eighth Five Year Plan (1992-97), the lack of effective rural infrastructure to facilitate access to agricultural inputs and outputs as well as basic services has been recognised as the main impediment to poverty eradication. The Plan called for the development of an extensive rural road network in the country as a prerequisite to achieving the national objectives of faster economic growth and poverty reduction. During that period, several national level studies were carried out to identify the need for a rural road network for the country. The District Road Network Studies (1992-93) proposed to construct over 14,000km of new roads representing an increase of over 150 per cent above the existing level. The Agriculture Perspective Plan (1995) proposed to construct an additional 6,200 km of rural roads in the next 20 years, in order to provide a reasonable road density for rural areas. The Priority Investment Plan (1996), although it did not sum up the total additional mileage, recommended the maintenance of the existing road facilities followed by construction of earth standard roads into areas currently not connected by road, especially in the hill districts.

Although a lot of work has been done at the national level to identify the need for rural roads, the operational plans of these major studies were not clearly conceptualised. The national level studies seem to have taken for granted that the objectives can be achieved by strengthening the present bureaucratic structure or creating a new one. For example, the District Road Network Studies assumed that, by strengthening the District Road Offices under the DOR, the additional work, could be carried out, while the APP proposed to create a separate organization, e.g., the Department of Agricultural Roads. The PIP (Vol III) talks about the technical and economic aspects of the projects identified, remaining silent on strategies for their implementation. In reality, the implementing agencies are the DDC\VDCs all over the country, which have very limited technical and managerial capabilities for carrying out such large projects. Further, as the DDC\VDCs are self-governing, statutory local bodies, they are competent enough to set their own priorities and operational procedures (Chapter 3). Therefore, the target set at the national level and the standards prescribed would only be meaningful when they are actually carried out at the local level with the same technical standards. Keeping these institutional linkages in mind, a clear rural road policy should have been prescribed as a part of the study.

In order to develop rural roads in a sustainable manner, several innovative experiments have been carried out that have shown encouraging results. The concept of a District Transport Master Plan, which was developed and tested in a number of districts, can prove to be an useful document for the DDCs in preparing annual programmes and plan for the maintenance and rehabilitation of district transport networks. Another innovative experiment of a low-cost environmentally friendly and self-help (LES) approach to rural road construction has been carried out in Palpa and Dhading districts. The LES approach is based on a series of principles to address a broad range of technical, environmental, and socioeconomic issues such as the phase-wise construction method to allow natural settlement and stabilisation, balanced cut-and-fill so that the roads merge into the landscape; bioengineering for slope protection; labour-intensive construction methods in order to use the underemployed rural labour force; use of indigenous skills, materials, and tools; and a participatory approach to road construction and maintenance. The LES approach could be very suitable for labour surplus and environmentally fragile countries such as Nepal.

### **5.2.2 Programme Level**

At the programme level, although most of the elements in the concept of a development project, such as development objectives, activities, resources, targets, and specific locations, are found in the DDC level projects, they seem to be included to meet administrative requirements rather than to achieve objectives. For example, a project is identified and designed, resources allocated and a users' committee formed for implementation. But all these steps are fulfilled only in a formal sense without being oriented towards and used for efficient use of available resources to achieve the stated objectives.

The policy framework and institutional arrangements that exist at the central as well as at the local level are not used effectively. For example, stages in the planned development process adopted in each district are different and the Manual for the Rural Road Programme, issued by the MLD, is not followed at the operational level. In fact, the local self-governing bodies such as the DDCs\VDCs are autonomous and set their own priorities and operational rules.

The MLD, which is supposed to coordinate at the national level and provide policy and technical support to the local level, is not properly equipped to enforce national policies at local level.

Similarly, a number of innovative experiments has been carried out on the development of a District Road Master Plan at the local level, as well as a low-cost, environmentally friendly and self help (LES) approach to rural road building (Chapter 2). However, these experiments do not seem to have impressed the policy-makers and implementing agencies (such as DDCs and VDCs) who have continued to follow their own practices in project selection and implementation. For example, the phase-wise construction method is prescribed in the road policy of the DOR; it prescribes a detailed engineering survey and design, costing of the construction/upgrading project, and planning of the construction works as a necessary initial phase. The construction of roads through the LES approach, the phase-wise construction method, is used to allow the natural stabilisation process for environmental protection and to coincide with the agricultural slack season so that labour for construction is available. But in the DDC/VDC managed projects, although roads are constructed on a phase-wise basis, there is no clear planning for inter-connection between phases, rather the phases are dictated by the budget allocations. Consequently, roads are always constructed on an *ad hoc* basis and, in many cases, the resulting roads are of such a low standard that they cannot be maintained. On the technical side, there is a lack of sufficient technical manpower for the projects run by DDCs, and the available technical manpower at the district level are scattered and not used effectively.

Finally, there is no clear maintenance policy for rural road projects. Two issues, one about the ownership of rural roads and the other about rural road users, are related to designing a road maintenance policy. On the ownership issue, the users' committee, even if it is organized and strengthened, cannot be the owner of a rural road project, as road users are identifiable. Due to the wide coverage of a rural road, the project users cannot easily elect a truly representative users' committee. In addition, there are regulatory functions for the operation of a rural motorable road such as closure of traffic during the rainy season, prohibition of heavy vehicles, or load limit, toll tax collection, tree plantation on the right of the way and regular maintenance work that could be difficult to enforce through a body such as the users' committee which is designed for increasing people's participation. For other types of rural road, such as trails, tracks, and suspension bridges, the users' committee, constituted either from the locality or of the lay officials of the VDC/DDC, could regulate periodic maintenance work through self-help.

The issue of effective use of a road is linked to the increase of production in areas connected by the road. The use of the road should be to provide inputs and technology from, and produce to, the market. In the absence of local production, use of the road would be only to carry in industrial products for retailers. As a result, the regeneration of capital for road maintenance through toll tax collection will be limited. Therefore, for the regulatory function, a separate body can be created at the district level that can coordinate all rural roads for the purpose of operation and maintenance. For increasing production in areas connected by a road, the DDC, VDC, or Municipality, depending on the type of road, should be involved in making plans to promote production, and this will ultimately generate more revenue from the roads.

### 5.2.3 Project Level

At the project level, it was found that various roads are interconnected and the economic benefits are also interdependent. On the whole, the road has reduced the feeling of isolation and remoteness among the population and has inculcated a sense that they are connected by road with the mainstream of development such as markets, social services, and development institutions. Moreover, the decisive control of the traders from frontier locations over hinterland trade has been weakened as a result of road extension beyond the frontier market. And, indeed, the transport cost, time, damage to goods in transit, have decreased considerably and the volume of business in the area of influence of the road has increased considerably.

The prices for staple goods did not decrease, except for salt and kerosene in Baglung District, in spite of the savings in transport costs in the study area. The road did contribute to an increase in the availability of merchandise in the areas connected by road and to a decrease the price differential between larger market centres and the road head. However, as the price did not fall below the base price already set before the road was established, but increased over a period of time, it appears that the benefits from saving transport costs were not passed on to the consumers. Thus, on the whole, the main beneficiaries were transport owners and retailers, not those who donated land free of cost and contributed free labour for the construction of the road.

The scale of production has increased, although with considerable variations throughout the study areas. Many of the locally available, non-marketable items, such as *Lapsi* in Kabhre District and Broom flower in Ilam District, have also become commercially profitable items. Production of valuable cash items with short shelf life value, such as vegetables and milk, benefitted from the roads, especially in Ilam and Kabhre districts. It was observed that potentials for increasing production existed in all study locations. Nevertheless, serious limitations were noticed in terms of input supply, technology transfer, marketing networks, pricing policies and risk sharing mechanisms.

In social sectors, such as education and health, the road has made a positive contribution, although the road is not the sole contributor to change. In education, a visible impact of the road is that good teachers from outside have also moved into teach in local schools. In the health sector, the road has made it possible to reach hospital more quickly.

Regarding the environmental impact of roads, two problems were observed in the road projects studied: manifest in landslides and soil erosion on the one hand and the unsound quality of the road resulting in problems of maintenance, on the other. First, the plan to plant trees along the roadside did not materialise even in the technically well-planned LES project in Dhading, primarily due to the confusion about right to the land by the roadside. Second, for the DDC/VDC managed roads, the available resources, along with people's free labour, were used mainly for earth excavation in order to enable vehicles to ply the road as soon as possible. This *ad hoc* approach to road building has had a serious impact on the environment. The road policy of the DOR, prescribing five stages for road construction (Section 2.3) in which Stage I must precede all stages for detailed engineering design, costing of construction/upgrading a road project, and planning the construction process has not been effectively enforced at the project level.

## 5.3 Recommendations

Based on the findings mentioned above, the following recommendations have been made.

### 5.3.1 Rural Road Network

The concept of rural roads, as defined in this report, is as an access to market in order to realise the development potential of the area; it includes rural motorable roads, tracks, mule trails, and suspension bridges. All of them interconnect with each other, making the motorable road the centre of the hierarchy which, in turn, connects to the feeder road and the highways. Such a combination would become a 'rural road network'. The strategy for the development of rural roads should include all these components, so that the positive impact of the 'rural road network' is realised.

### 5.3.2 Rural Road Policy

The policy framework for rural roads is weak and unclear, and many the policy guidelines are not enforced effectively at the project level. A comprehensive rural road policy to include the following elements is required and recommended.

#### (a) An Institutional Mechanism

Currently in Nepal, the authority for identifying needs planning projects, implementing them, and maintaining and operating rural roads is too defused and uncoordinated. Coordination at one point is needed so that the resources are used efficiently. For the regulatory functions at the local level, such as closure of traffic during the rainy season, prohibition of heavy vehicles, load limits, toll tax collection, tree plantation on the right of the way, and regular maintenance work, a public office such as a District Road Authority, accountable to the local government, needs to be established at the district level. At the same time, in order to make the road economically viable by increasing production in the areas connected by it, the local government should coordinate the activities of sectoral agencies, NGOs, and private sectors in production, transportation, storage, and marketing of local products.

The rural road programme also needs financial, technical, and policy support at the national level. Therefore, there should be a proper institutional setting at the local as well as the national levels. Local level institutions should work at identifying needs; planning projects, and implementation, maintenance and operation of rural roads, while the national level institutions should be concerned with policy formulation, technology, quality control, and mobilisation of internal and external resources.

#### (b) Technology for Rural Roads

There are two points for serious consideration. First, the employment opportunities generated by rural road projects must be retained locally as far as possible. Second, since rural roads are likely to pass through farmland and village settlements, the environmental considerations must receive top priority. Among the currently available technologies in Nepal, the LES approach seems to be an appropriate one. Such technology should be used widely for

the development of rural roads. Moreover, further research is required to adapt other indigenous technologies, e.g., cement-less suspension bridges (Box 2), for the development of a rural road network.

### 5.3.3 The Road Head Concept

In all districts, development of *Bazaar(s)* along the roadside, typically with teashops and hotels, were observed. Though some of these *Bazaar(s)* have developed as marketing points for agricultural produces from adjoining villages, they lack physical facilities, usually the space for collecting, processing, packing, storing, and loading and unloading goods. Therefore, in order to develop organized marketing centres along the road, suitable areas that are connected with the main mule trails near major settlements and are potential areas for the development of a 'road head' could be identified during the alignment of a rural motorable road. Some infrastructural support, such as land stabilisation and construction of link roads, could be given during road construction. Most likely, settlements in such stabilised areas will be spontaneous, but some external support may be needed to avoid unorganized mushrooming of structures. Eventually, the road head could be the market outlet for the surrounding villages. It would also discourage ribbon settlement along the road; dangerous in terms of road safety as well as in terms of human health.

Through the 'road heads', institutional support, such as inputs, credit, and technology, can be spread throughout the hinterlands. One method would be to use the JTs\JTAs as effective contact points at the road head. If JTs\JTAs were supported to open retail shops for vegetable seeds, fruit saplings, and other inputs at road heads, the people concerned could reach them and also find out about cropping methods. At the same time, the JTs\JTAs could be marketing channels for certain locally-produced items, such as vegetable seeds, that could be supplied to other places where there is a demand. In this way, the JTs\JTAs can earn enough to live with their families in the field and be available to provide services to the farmers in the area.