

SUSTAINABLE MANAGEMENT OF RURAL ROADS

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ABSTRACT

The provision and maintenance of a sustainable rural road network requires a sound institutional capacity able to deal with the technical, financial and administrative challenges in the provision of a sustainable and affordable network, serving the economic and social needs of the rural population. The parlous state of rural roads networks in many developing countries is not merely a problem of lack of financial resources. Lack of capacity to plan and implement the works is also a serious constraint. Political interference, the imbalance between funds allocated for improvement of roads and those allocated for maintenance, the limited user involvement, poor financial, budgeting and procurement systems contribute to the problem.

The paper draws together the work carried out by the ILO and other agencies on the development of the capacity of decentralised road agencies, the establishment of financing procedures and budgeting, the promotion of effective contract management systems, the search for functional maintenance based on the principles of asset management and the need to integrate rural road development with other sectors such as health, education and agriculture in order to maximise both the economic and also the poverty reduction potential of a coherent rural road network.

1. THE SITUATION AND ITS IMPACT

Since the early 1980s massive investments have been made in rural roads. There were several reasons for this. In the first place it was a natural extension of investment into the lower parts of the road networks given the major investments that had already been made in the national highways of most countries. It was therefore a logical step to develop the whole of the road network.

Underlying this was a belief that rural roads and the vehicles that travelled on them would provide the catalyst for increased economic activity in the rural areas. It also responded to the change in development thinking towards a belief in the necessity to develop the rural areas so that agricultural production could be stimulated and to ensure that jobs and livelihoods could be created locally to limit the urban drift. The development of the rural road network was seen as, if not the prime mover in this, certainly an important facilitator. Indeed the justification for rural road investments was, and to some extent still is, based on their effect on the rural economy.

The investments made in rural roads therefore seemed to be justified not only in purely transport planning terms but also in both economic and social returns that could be expected from these investments.

This fever of investment in rural roads was almost totally concentrated on new construction and improvement works. The fact that the expansion of the road network

would require additional funds for its maintenance was, if not ignored, considered a separate issue that could be dealt with at a later stage.

Worldwide in the developing countries, rural roads represent between 70 and 80% of the total length. However they only account for some 15-20% of the traffic volumes on the network. [14]

In the Asian region for example, the road network increased significantly over the last 20 years. In the period 1998 to 2004, the South Asian and East Asian regions showed an overall increase in the road network of 88% and 83% respectively. In East Asia, China accounted for the major part of this increase. However, even in the other countries of the sub region the increase was over 50%.

Despite the significant increase in the rural road network, the level of accessibility of the rural population still remains low. The level of rural access, based on the percentage of the population being less than 2 km from an all season road, is shown in Table 1. In Sub-Saharan Africa, values of the rural access index are the lowest at 30 percent. [1]

Table 1 - Rural Access Indicator for Selected Countries

Rural Access Index for selected low-income countries (Percentage of rural population within 2 km of an all season road)			
Country	%	Country	%
Albania	31	Madagascar	25
Azerbaijan	67	Malawi	38
Bangladesh	37	Mongolia	36
Benin	32	Nicaragua	28
Burkina Faso	25	Niger	37
Burundi	19	Nigeria	47
Cameroon	20	Pakistan	77
Chad	5	PNG	68
Congo DR	26	Tajikistan	74
Ethiopia	17	Tanzania	38
Ghana	34	Uzbekistan	57
Guinea	22	Vietnam	73
India	60	Yemen	21
Kenya	44		

In addition the rural roads that have been developed have not increased the proportion of the rural road network that is in reasonable condition, principally due to lack of maintenance.

Table 2 - Rural road condition in selected countries in Asia [13]

	Portion (%)of rural roads in poor condition
India	60
Madhya Pradesh	80
Uttar Pradesh	80
Jharkhand	81
Himachal Pradesh	55
Philippines	65
Lao PDR	73
Bhutan	53% of District and 86% of feeder roads
Pakistan	>50
Indonesia	50

Source: Authors' analysis of various World Bank, ADB and Government statistics

This paper is concerned with the requirement to have sustainable management of the rural roads so that they can fulfil the potential for economic growth and poverty reduction.

The authors have been involved in a range of programmes and studies on rural roads in recent years.[2,3,4,5] These have provided in depth insights into the range of issues facing local authorities, civic society and the private sector in the provision of a viable rural road network. In addition the work carried out by the ILO and other agencies has not only identified the constraints facing the sector but has provided a range of good practices which support the establishment of the rural road network. Much of this work has been based on the principles of developing institutional capacity at local level and maximising the use of local resources.

2. THE PROBLEM

The dilemma posed by the major investments in rural roads came to a head in the early 1990s. It became clear that the investments that had been made were not providing the benefits that had been predicted. [6] Several reasons were postulated for this amongst which was the lack of understanding that benefits would not accrue if complimentary activities to the road investments were not implemented in parallel with the road improvements. However, it was also becoming apparent that the burden that the increased network had placed on the recurrent budgets was too much for it to bear. Consequently, roads were deteriorating at such a rate that the intended benefits were being lost.

Accurate figures on maintenance expenditure are hard to come by. An analysis of several countries in the Asian region has shown that there is insufficient money to maintain the total road network from centrally allocated funds.[2] Nevertheless, studies carried out by the ILO have shown there are potential and sufficient funding sources in addition to central funding for maintaining the maintainable parts of the road networks [3,4,5].

The limited funds available for rural road maintenance are often used for other activities as, in a cash deficient situation, local authorities commonly placed greater emphasis on road building activities. The basic problem however is that the road network is growing at a greater rate than the recurrent budget can deal with.

Finance is certainly a problem, however there was and still is a basic institutional problem. Decentralisation is the order of the day in many countries. This process is often carried out by transferring responsibilities from centrally based agencies to local authorities. However this is often done without, at the same time, transferring the required financial resources. In addition, the technical and managerial capacity at the local level to provide road maintenance is insufficient.

The classical approach to maintenance of public roads has been through a central government works department in charge of all civil works under government authority. Public works departments in a number of countries still have large road works sections, organised with satellite offices at strategic locations around the country. In some countries, the choice has been to rely on one single road works agency for the provision and maintenance of the entire road network, ranging from highways to rural roads.

The strength of this arrangement is that scarce resources for management and operation of public roads are consolidated into one organisation. With budgets, staff and logistical resources earmarked for rural road maintenance, this arrangement can prove feasible if the authority has established local offices close to the network and are able to respond in a timely manner when inputs are required.

With recent trends to decentralise authority to local government, the responsibility for the provision and maintenance of rural infrastructure, including rural roads, has in many countries been transferred to local government administrations. In such arrangements, a road works unit is often established within the relevant technical department in the local administration.

There is a growing understanding among governments and key players in this sector of the importance of giving the authority and responsibility to local authorities. However, the change required to develop the required capacity is a major challenge. Nevertheless, experience has clearly shown that if the local institutions are provided with the means to handle new responsibilities, they are perfectly capable of assuming them.

When rural infrastructure is planned as part of a central government programme, it is too often done in relation to the development of the sub-sector alone. The decentralisation of authority to the local level (i) allows all types of infrastructure such as roads, clinics, schools, irrigation to be planned in relation to implementation of other infrastructure, and (ii) may achieve a better reflection of the real demands of the local communities. Building proper ownership already at the construction stage may increase the pressure from local communities to secure adequate maintenance of the improved roads.

Genuine decentralisation enables local organisations to "exert pressure" and therefore to defend their projects better because, at that level, the negotiating partners and the needs of the population are better known. The main issue here is that local authorities are held responsible to the users for their actions. When works are managed by personnel who reports to some central agency, this pressure from the local population is diluted, since central agencies and their staff take their orders from superiors situated in the capital or provincial headquarters.

For the past 30 years, there has been a series of attempts to transfer at least some of the maintenance burden of rural roads to the local communities. Most of these initiatives have been on a project basis with some mixed results. What is evident is that in order for this to

take place with a minimum of success, there will always be a demand for considerable support from a technically competent agency. [15]

Equally, most of these initiatives have proven that it is difficult for most rural communities to shoulder the entire costs of the required maintenance. Experience suggests that none of the models developed, in which the communities take the lead role in providing road maintenance, have been mainstreamed on a national basis as a solution to the lack of maintenance of rural roads.

Whilst finance is certainly a major issue for rural roads, the most important institutional issue is that of capacity. This has been poorly dealt with in the devolution process. Even if sufficient funds are available, if there is not the capacity at the local level then the efficiency gains of decentralisation will not materialise. In the roads sector relatively little has been put in place during the decentralisation process to ensure that the staff within local authorities possess the knowledge to effectively deal with sustainable road management.

Institutional capacity to perform efficiently is particularly important for road maintenance. Maintenance involves the capacity to plan and carry out the works at the right time, preserving investments with solutions which are cost-effective and thereby utilising available funding resources in the most efficient manner.

An additional factor is that, in recent years, there has been a tendency to move away from public sector provision of infrastructure services towards the involvement of the private sector. This has obvious benefits in that the private sector is usually perceived as more effective in delivering services. However, this still requires both contracts management capacity at the local level and supervision to ensure that the work is carried out effectively.

The level to which responsibility is devolved in a decentralised system has more to do with political considerations than with either economic or functional efficiency. Unfortunately, the result is often that the level to which the responsibility for rural roads is devolved is not optimal. In the Philippines for example the Barangays are responsible for the maintenance of the 160,000 km of Barangay (tertiary) roads. Each Barangay is responsible for no more than 2-3 km of road. [5] Whilst this should result in those roads being maintained, in practice it means that they are ignored. Not for any wilful disregard but because the funds available at Barangay level are so limited and there is no technical capacity to deal with roads. In India, responsibility for rural roads is devolved to the Panchyati Raj Institutions. However they, in common with most decentralised agencies in the region, rarely have sufficient funds and often have limited technical expertise.[4]

Only in rare cases has the devolution of responsibility been accompanied by the requisite financial and technical capacity to shoulder that responsibility. Even if there was a political will, even if attitudes towards maintenance changed and even if finance was available, the implementation of effective road management would not be done unless the appropriate capacity existed

3. LESSONS LEARNED

3.1. The Development of Capacity

In recent years considerable effort has been made to develop the rural road network. This has generally improved the access of the population to economic and social services.

However it is clear that the capacity at the decentralised levels to provide and even more importantly to maintain these networks is limited. [7]

Access is accepted as being of prime importance to the achievement of the MDGs. There is also justifiable evidence that rural roads can provide much of the access needs of the rural population.[8] However it is not the construction of roads that ensure the access. If they become impassable after the first rains then their access value is lost. It is maintenance which provides the sustained access and contributes to the achievement of the MDGs.

Improving a rural road provides the opportunity for a reduction in the price of consumption goods; for ensuring that cash crops can be exported to the local market in a timely fashion; that children can attend school on a regular basis; and that medical attention can be obtained when necessary. However it is maintenance which ensures that the opportunity which is provided is not only taken but can be sustained.

Much has been written recently on the poverty reduction potential of rural roads. This is generally seen as a plea for more investment in rural road rehabilitation. However it is the maintenance of rural roads which is going to ensure continued access. Such continued access will provide the potential to significantly contribute to the achievement of the MDGs.[8]

Through its programmes on sustainable rural infrastructure, the ILO has been able to draw some conclusions on both the extent of the problem and on the key areas that need to be addressed.

In general decentralisation should provide the opportunity for decisions to be taken at the local level; for funds to be used for locally defined problems; and for communities to become more involved.

The most serious challenge however is the lack of capacity. Greater responsibility is given to local managers, administrators, planners and engineers. This in turn means that they have to have the capacity to be able to respond. Lack of capacity is often cited as the reason for not devolving full authority and allocating the necessary funding for maintenance. Equally local authorities often underestimate what is involved in taking on this responsibility.

The lack of capacity is also closely linked with the issue of the appropriate level of devolution of responsibility. In some countries the administrative unit to which responsibility has been devolved is dealing with only a few kilometres of road. In others the central ministry is still responsible for the whole of the rural road network. In the first case it does not make sense to develop the capacity to deal with 2-3 km of road and in the second case the central agency is far too removed from the object of their responsibility.

The development of effective capacity has to be undertaken, therefore, with the full understanding of the level at which authority exists for each function of the road development and maintenance process.

Table 3 lists some key tasks and responsibilities, which need to be clearly allocated at various levels of the hierarchy within the relevant authorities at national, provincial, district and sub-district level. As seen from the table, there are a number of activities which need to be dealt with at local level, and equally there are other tasks which are more

appropriately addressed by central authorities. The division of responsibilities shown in this table will vary from one country to another and depends on the type of works and the conditions in which the works are carried out.

Table 3 - Administrative levels of responsibility

Level	National	Provincial	District	Commune
Data Collection			✓	✓
Planning	✓	✓	✓	✓
Budgeting	✓	✓	✓	
Plan approval	✓	✓	✓	
Budget approval	✓	✓	✓	
Source of funds	✓	✓	✓	
Standard setting	✓			
Authority to classify	✓	✓	✓	
Works Implementation		✓	✓	
Supervision		✓	✓	
Maintenance			✓	
Award contracts		✓	✓	
Monitoring	✓	✓	✓	✓
Accounting		✓	✓	

3.2. Implementation

A wide number of implementation arrangements have been devised for executing rural road provision and maintenance, ranging from mobile force account units, use of local contractors and community contracting with various elements of voluntary inputs. Any, or all, of these arrangements can be effective, and the solution chosen is very much dependent on prevalent government and donor policies on the provision of public works. Nevertheless, the effective execution of any of these implementation arrangements requires an efficient management organisation.

The problem is particularly severe in the case of maintenance. In a number of countries today, it is evident that there is simply no institutional home for rural road maintenance – or at best it exists on paper but not in practice. The reasons for this differ from one country to another. A general trend, however, which is found in several countries, is that when the responsibility for the provision of rural infrastructure is decentralised to local government authorities, the responsibility for rural road maintenance is moved to institutions with no history or capacity in relation to rural road maintenance.

To be able to even begin to plan road investment and maintenance, engineers and technicians need to have an understanding of the road network. This implies that key data on the length, traffic levels and condition of the roads is known with some degree of confidence. This has particular importance in relation to the maintenance of rural roads. Without reliable data it is simply not possible for engineers to develop and effectively argue for providing funds for road maintenance. Local officials are aware that funding is limited. To make a case for maintenance funds engineers must show that they have identified the key links in the network, understood what is required to maintain them and provide a coherent budget and plans to implement the work.

3.3. Financial Management - Accounting and Cash-flow Arrangements

The major criticism of decentralisation is that the devolved bodies are not capable of effectively managing the finances. Critics state that the local authority cannot handle the funds. However, experience shows that they will develop the capacity when they are given the opportunity to take on such responsibilities. The most common weakness in financial management systems is actually a lack of capacity, which is often related to poor procedures and inexperienced staff.

Contrary to common belief, it is not the misappropriation of funds, but rather the lack of or poor accounting of funds which results in the shortcomings of finance and accounting systems in local government institutions. Nevertheless, it is a major challenge. There is the question of the development of effective financial procedures at the local authority level and there is the issue of the organisational arrangements and responsibilities.

The financial system required is not only limited to procedures at local level. It also encompasses procedures for cash flow arrangements from the various sources of funding, coordination of the release and the authority to instigate the release of funds. Funds sourced from central authorities need to arrive at local government well in advance of works or commitments, before contract awards are carried out. The most common reason for liquidity problems at local government level is actually the slow and irregular transfer of funds from central level. In order to safeguard this vital issue, there is obviously a need for appropriate procedures for preparing cash flow projections, requesting the funds well in advance and ensuring that they arrive on a timely basis and at regular intervals.

Proper and timely accounting provides the basis for projections of expenditure and cash flow requirements. Accounting procedures can be established using computerized methods or "paper-based" systems. The accounting system needs to meet the reporting requirements related to (i) documenting the various types of work carried out and (ii) the specific reporting requirements of various funding sources. Specific programmes or projects may not only require separate reporting, but also separate accounting and dedicated accounts. Such arrangements improve the transparency in fund management. They also instil confidence in donors and central government in terms of local level financial management capacity.

As compared to force account operations, the use of contractors involves a substantial reduction in the number of financial transactions for local accountants. [7] When carrying out works through force account, all details of expenditure are left with the accounts unit of the local authority. With the use of contractors, this level of detailed accounting is effectively privatised. Works completed by contract are normally paid on the basis of measured quantities, summarised in monthly payment claims, involving one single payment transaction each month to be processed by the local government finance unit. When working with contractors, all financial transactions should be carried out through the use of private banking facilities. Payment of works should be carried out by bank transfer or by cheque, thereby minimising the amount of cash handling.

3.4. The Promotion of effective contract management systems

Devolution of responsibility provides the opportunity for greater involvement of locally based contractors. However, it also requires that the capacity of the local contractors is equal to the task, and that there is a sufficient capacity to administer and supervise the contractors.

The first step in this process is to establish an efficient contracts management capacity in which contains effective contracting procedures and appropriate contract documents. The next steps are to (i) provide support to the contractors both in terms of technical training but also in relation to business capacity, and (ii) build up a local contracts management capacity. Contracts management capacity needs to be developed at the appropriate level of local government, where qualified staff is found or can be recruited.

It is often ignored that the privatisation of works implementation requires a certain level of capacity in the local authority agencies to administer contracts. It is of little value having effective and efficient contractors if the administration of those contracts is inefficient, slow and/or unduly bureaucratic – or simply not prepared or authorised to carry out this task. Therefore, appropriate management procedures needs to be established and local authorities trained in terms of establishing who and how they will be involved in contract administration.

It is important to bear in mind that contract management also include the payment of the contractors. In other words, these responsibilities need to be vested in an institution which not only have sufficient technical know-how, but also possess a financial management capacity. If this capacity is lacking, it is imperative such skills are developed within the local authorities. Local government organizations often include a small public works department. In many countries, their level of activity has been very low and for this reason, limited resources have been allocated to their units. When larger responsibilities are vested into local government, it is often necessary to strengthen these institutions, thus enabling them to effectively carry out the duties involved.

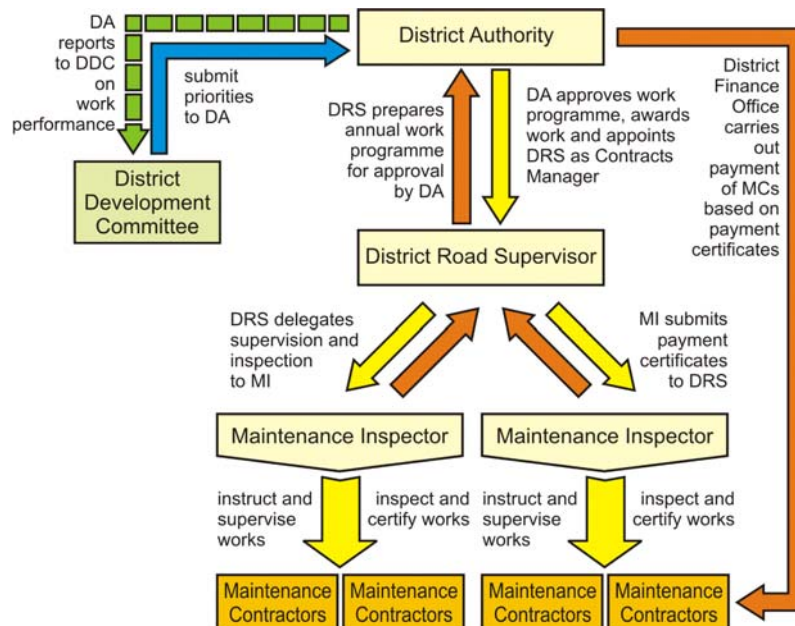


Figure 1 - Maintenance Authority [10]

The figure above presents a flowchart of events in relation to the planning and execution of rural road maintenance. It indicates how the stakeholders at local level are involved in the various aspects of maintenance management.

Rural road works would ideally be initiated by a demand voiced by the users of the assets created or rehabilitated. However there is a major input from the technical service as priority needs to be given to the maintainable roads in the network. Once the political bodies have set their priorities, the plan is submitted to the local authorities for implementation. The local authorities would then engage their technical staff to develop detailed plans and detailed cost estimates. This information is finally fed into the annual work programme and budget of the district/province.

3.5. The search for functional maintenance based on the principles of asset management

Rural roads form an integral part of national road networks. It can be argued that during the past 30 years, the capacity to maintain such roads has been lost in a number of developing countries due to the institutional changes which have taken place. In the past, road maintenance, including rural roads, was carried out by centrally organised force-account operations. With the structural adjustments carried out in these countries, such operations have been privatised, leaving the government only with a managerial responsibility. This process has arguably been successful in terms of transferring implementation capacity to the private sector for main roads. Central road works organisations have developed effective systems and procedures for managing private construction firms executing highway maintenance and improvement works. However, in parallel to this process, the responsibility for rural infrastructure has been transferred to local authorities, and in this process there have been very limited attempts in rebuilding implementation and management capacity.

The problem is particularly evident in relation to rural road maintenance. Rural road networks are facing a crisis in terms of maintenance and operation. Whilst the technology already exists, is simple and inexpensive, local capacity and funding for managing and implementing such works are missing or lacking in a number of developing countries.

The asset management approach [9] tries to move the debate over road maintenance away from the purely technocratic and even political to concentrate on “the inherent value of the network expressed in money terms”.

The idea is relatively simple. It is possible to estimate reasonably accurately the asset value of the existing road network. Lack of maintenance will mean that roads will deteriorate over a relatively short period of time. Investment in rehabilitation and/or new construction will increase the asset value but this is likely to be more than offset by the deterioration of the network due to lack of maintenance. It is therefore possible to compare in money terms a strategy which gives low priority to maintenance and higher priority to rehabilitation and construction and one which places higher priority on preserving the existing network. These calculations are not complicated and local decision makers can make them. This means that they themselves can see the financial consequences of their decisions whether to invest in maintenance or rehabilitation.

An assessment of rural roads in Battambang Province in Cambodia showed that between 1998 and 2000 US\$1.5 million per year had been invested in rural roads. However over that period no maintenance had been carried out. Consequently the asset value of the rural roads which in 1998 had been US\$2.5 million had fallen to US\$1.7 million. The cost over the period of keeping the network in its existing condition would have been some US\$800,000, 20% of what had been invested [11].

The asset management approach demonstrates the financial benefits of investing funds in maintenance. In addition it integrates both construction investment and maintenance

expenditure into a more holistic assessment of the appropriate use of the total financial resources available for the road network.

3.6. The implementation of maintenance

There is a variety of different modes of implementation for rural road maintenance as shown in the figure below. A combination of approaches 1 and 2 is the classical setup often used when authorities choose to carry out works relying on force account operations. When road works are carried out in this way, equipment, materials and labour are provided directly by the agency. The effectiveness of these maintenance approaches is largely dependent on the availability and utilisation of transport and equipment. The third approach covers the “lengthman” system, which has been applied with varying degrees of success in a number of countries. Although this arrangement in principle relies on a contract in which the workers should be paid on the basis of outputs, it is often the case that due to limited supervision resources, payments are instead based on attendance – and in effect resemble the old force account arrangements. The drawback with these systems is that, (i) due to the lack of production related incentives, productivity rates are low, and (ii) with the limited supervision provided to the individual workers, their work priorities are often incorrect or not according to the real work priorities.

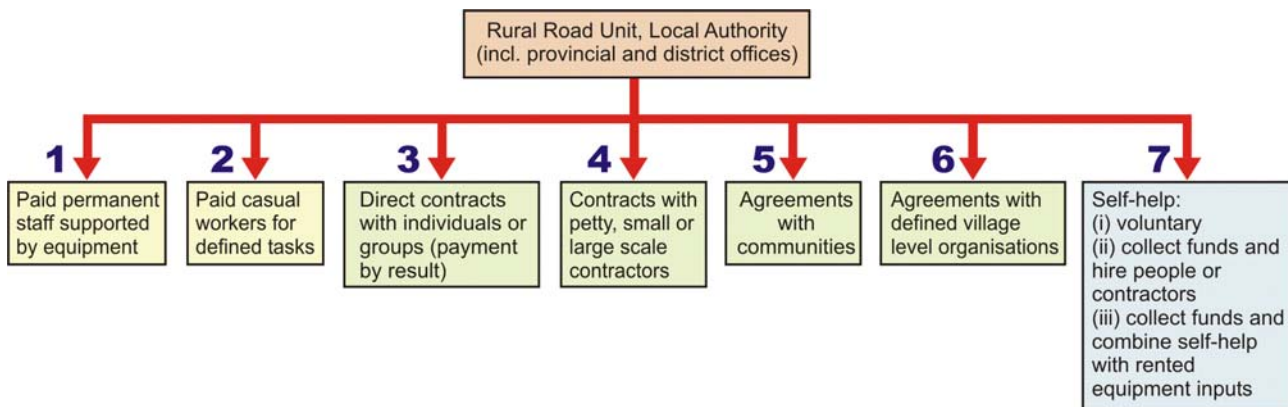


Figure 2 – Implementation Modes

The alternative approaches, such as the ones specified under 3 to 6, are likely to require substantial technical and managerial inputs, particularly in the development phase. Despite this initial organisational requirement, it is often the experience that contracts with specific groups eventually demand less supervision, are more transparent and by basing payments entirely on work outputs, are more cost effective. By engaging contractors, communities or other local organisations, agreements are made based on work outputs. The actual supervision of the individual workers is then delegated to the contractors, and is no longer the concern or duty of the technical agency.

3.7. Community involvement

As a result of the limited financial resources available, many local government organisations have looked to community participation as a means to expand the resources available to them. However, for road maintenance such efforts have proven to be difficult to sustain at the level of input required. The provision of public infrastructure at local level needs to be backed up with the necessary means for the local authorities to provide these services. Great caution should be taken with regard to leaving the financing responsibilities with the users of services which are provided by the government.

It is also important to avoid situations in which government authorities resort to self-help schemes to justify using unpaid labour due to budgetary constraints. The use of

community self-help in the form of unpaid labour is an issue which is often susceptible to simplistic solutions. An argument often heard is that rural roads are built specifically for the benefit of the people and they should therefore shoulder the responsibility for maintaining the road [12].

One has to remember that roads are built to carry vehicles and in most cases also cater for other types of traffic in addition to the villagers living along the road. The road users may also consist of long distance traffic; government service providers; and commercial enterprises, such as merchants, contractors, logging companies and others conducting business in the area.

The communities recognise the benefits from improved access to markets, easier access to government services and better connection to the outside world. Nevertheless, they do not necessarily recognise the individual benefit that will come to them. After all, most of them do not own a vehicle. Many are subsistence farmers and have no real need of roads and markets. Indeed, they may feel that as individuals they cannot see the benefit that will accrue to them. At best, they may be prepared to maintain the road where it runs through the village but, experience suggests that, they will be unwilling to maintain more than that.

In the majority of cases, however, further inputs in the form of regular cash wages will be necessary in order to establish a continuous and sustainable maintenance system. Regular and sustained inputs can also be commercially negotiated with individuals, villages and village organisations (youth organisations, farmers associations, etc) acting as petty contractors.

Most projects that have attempted to transfer the responsibility of road maintenance to local communities have not been successful in sustaining such arrangements. Moreover, the community contributions would normally be limited to covering only a portion of the resources required, typically in the form of voluntary labour for routine maintenance activities. As road maintenance also requires other resources such as materials and the use of construction equipment, external support is still required since most communities do not possess nor can afford to acquire such resources. [16]

Studies have shown that in most developing countries there is simply insufficient wealth to shoulder the cost of maintenance of public roads. For this reason only, it is clear that community involvement should rather focus on planning and identification of appropriate infrastructure improvement as well as playing an important role in terms of expressing the views of the users in relation to the performance of maintenance and operation of the road assets.

There is also a large moral dimension, which is often overlooked. On the one hand, people who live in wealthier urban areas obtain these services for free, while people in rural areas as well as in poor urban settlements are expected to pay for them.

4. CONCLUSION

The provision of access is a prime factor in poverty reduction and rural roads contribute significantly to the provision of access. The social and economic impacts of rural roads are well established. Rural roads facilitate marketing, schooling and health services. Better access provides the opportunity for increased income and employment opportunities and contributes to the alleviation of poverty. However, it is not merely the construction of a road which provides access but the sustainability of that access through effective

maintenance. This ensures that the benefits that are generated with the improvement of the road network are continued.

Road deterioration due to lack of maintenance has become a growing issue in a number of developing countries. Although the results of a lack of maintenance have been well defined and quantified, the extent of the problem is not fully appreciated and the solutions still not commonly understood. Equally, the measures required to rectify the shortcomings are under-estimated. These include the scale of support and capacity development required, and the time-scale necessary for establishing an effective road management system.

In order to rectify this problem, there is a need for both increased funding as well as capacity development in order to provide sustainable management of rural road assets.

Funding support to rural roads need to address the real challenges in the sector instead of merely allocating more money to new construction. A concerted effort is required to address the issues of (i) funds shortage for rural road maintenance and (ii) equally important, the lack of, or in many cases the complete absence of, a competent agency tasked with the responsibility to carry out the maintenance works.

Before any serious attempts can be made to build up a sufficient capacity to deal with rural road maintenance, it is important to establish a proper policy framework in which the task is well defined and the main government actors are identified. This policy will need to be supported with a strategy on how sufficient capacity can be established in order to address current and future maintenance challenges.

Issues which forms part of this development process will need to include:

Financial issues:

- Creating an inventory of the rural road assets and the condition of the network, and thereby obtaining a better understanding of the magnitude of the challenge;
- Establishing appropriate estimates of the cost of maintenance, thereby providing the government with indications of the total funding requirements;
- Establishing the necessary funding mechanisms including identifying sufficient funding sources;
- Establishing appropriate programming and budgeting procedures and financial management which secures the timely and correct use of the funds;
- Install control and monitoring measures which ensures that the system is efficient in protecting the asset value of the road network and avoids any future deterioration.

Capacity Development Issues:

- Clearly defining the roles and responsibilities of various level of government for rural road maintenance;
- Creating competent institutional bodies at different levels of government to monitor the performance of the network and to effectively manage the maintenance works;

- Developing the procedures and necessary technical capacity in local government bodies to efficiently oversee and implement timely measures to preserve the existing local road networks;
- Develop the necessary systems and procedures for programming, design and budgeting of rural road maintenance works;
- Achieving an improved understanding and appreciation of the principles of asset management among local level planners and decision makers;
- Ensure that local technical units are equipped with the necessary human resources and skills required to manage a local road network;
- Develop the necessary technical capacity within the local construction industry to carry out the necessary maintenance works;
- Develop in-country training institutions to deliver training in rural road maintenance for both government and private sector technical staff;
- Establish a contract management capacity within local administrations.

It is important to note that each of the items involve a series of sub-activities each of which require substantial resources and commitment in order to reach adequate and sustainable results.

The lack of maintenance is not only an inefficient and expensive way of managing rural roads, but also has a set of negative social impacts. Rural roads often form the most important link in terms of providing access for the rural population. Their permanent or seasonal absence will act as a crucial factor in terms of the access of rural communities to basic services such as education, primary health care, water supply, local markets and economic opportunities.

Improving a rural road provides the opportunity for a reduction in the price of consumption goods; for ensuring that cash crops can be exported to the local market in a timely fashion; that children can attend school on a regular basis; and that decent medical attention can be obtained when necessary. However it is maintenance that ensures that the opportunity provided is not only taken but can be sustained.

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