

SUSTAINABLE RURAL ROAD

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TECHNICAL COMMITTEE A.4 RURAL ROAD SYSTEMS AND ACCESSIBILITY TO RURAL AREAS

INTRODUCTORY REPORT

CONTENTS

executive summary	3
COMMITTEE MEMBERS WHO CONTRIBUTED TO THE REPORT	4
1. Strategic Themes	4
1.1. Introduction	4
1.2. Rural roads and the Millennium Development Goals (MDGs).....	4
1.3. Constraints in rural road provision	5
1.4. Successful practices for the sustainable maintenance of rural roads.....	5
2. Accessibility and planning of the development of rural road network.	5
2.1. Introduction to accessibility and mobility planning.....	5
2.2. General planning aspects	5
2.3. The Planning Process	6
2.4. Planning tools	6
2.5. Recommendations to planners	6
3. Sustainable maintenance of rural roads	7
3.1. Importance of rural roads maintenance	7
3.2. Socio-Economic Importance of Rural Roads Maintenance	7
3.3. Rural road sustainable maintenance practices.	8
3.4. Tools for Sustainable Maintenance	9
3.5. Cases Studies.....	10
4. Involvement of Local Community in Rural Roads.....	11
4.1. Background of Community Participation in Infrastructure	11
4.2. The importance of community involvement.....	12
4.3. Need for Participation of Community and its Scope.....	12
4.4. Practices of Community Participation	12
Conclusions	13
BIBLIOGRAPHICAL REFERENCES	14

EXECUTIVE SUMMARY

Isolation is a major constraint to development, especially in rural areas. A lack of access to goods, markets and services deprives people of opportunities to improve their livelihoods and sustains poverty.

Rural road infrastructure is a prerequisite for economic growth and poverty alleviation. But it is no guarantee! If the objective is to improve access in rural areas, there is a need to understand the basic, social and economic access needs and constraints of the local people in order to address their specific needs. With this understanding a tailored approach can be applied.

It is a known fact that the lack of well-maintained roads generally increases transportation costs; as a result, local and national economies are hampered. Moreover, public and utility services experience difficulty providing for rural communities, particularly in regards to health and education, resulting in an inestimable cost to human development.

In contrast, properly maintained road systems reduce general transportation costs, as well as benefit the country's development. However, it should be noted that states face budgetary constraints, challenging a country's ability to tackle large infrastructure projects. As a result, it is necessary to adopt viable technical and financial methods of sustainable road management.

Reliable and effective infrastructure still remains to be provided to large portions of the rural population living in developing countries in order to improve accessibility and reduce isolation. The World Bank estimates that around 900 million rural inhabitants are without reliable transport access. In Sub-Saharan Africa only 34% of the rural people have access to an appropriate transport system. In South East Asia the figure reaches 57%, but it is far from acceptable.

The planning of rural roads must have the sustainability aspects at the forefront to be effective. Far too often in the past, interventions have either been too narrowly focused or grappled with development policies in the broadest terms. It has been difficult to bring together high level strategic thinking with the local context in a way that ensures optimum outcomes, and many projects, despite the best intentions, have under-achieved. Today, there is a better recognition for the complex process, albeit it does not necessarily mean pro-poor outcomes.

In this sense, several countries from the different continents have shared within this technical committee their works, experiences and suggestions on the process involved in a new planning model for road management, focusing mainly on the sustainability of maintenance in rural roads, which is an essential factor in order to ensure the appropriate access and mobility for rural population, significant progress in meeting their most urgent needs and reducing poverty.

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This introductory report refers to the report drafted by the Technical Committee which will be published after the congress.

1. Strategic Themes

1.1. Introduction

Roads are a prerequisite for economic and social growth of rural areas in any country, but more important than the roads themselves are the aspects of accessibility and mobility of the rural people. This document, which serves as an overview of tools and approaches applied for planning rural roads, emphasizes the importance of these two aspects in the planning process.

On the other hand, the importance of an integral approach that involves the interested parties in a participative process in the evaluation of the solutions to the transportation needs of the whole population is stressed.

1.2. Rural roads and the Millennium Development Goals (MDGs)

It is now 10 years since the world leaders came together to commit their nations to a new global partnership to reduce extreme poverty. This was the first time world leaders pronounced time-bound targets to reduce poverty worldwide. They adopted eight Millennium Development Goals (MDGs). Even though there is no objective for transportation itself, it is recognized that this has been a key factor in the achievement of the objectives concerning poverty reduction or the investment in other sectors.

1.3. Constraints in rural road provision

This chapter highlights the fact that the provision of rural roads is not without its problems; it lists some examples and concludes that the technical issues are the top of the iceberg while institutional and external factors have a much bigger impact

The challenge for engineers and planners in developing countries is to find cost-effective solutions that facilitate the provision of rural roads that are safe, durable and maintainable.

1.4. Successful practices for the sustainable maintenance of rural roads.

Information regarding the best practices on sustainable maintenance of rural roads is provided, particularly stressing those in Asia, Africa and South America. The report includes a full review of the methods and approaches considering planning, financing and management.

The connection between rural accessibility and poverty has been a key factor in order to trigger community participation. Rural roads as a component of the rural transportation network and as the way to access rural areas are in essence a community asset. The sustainability of its operation obviously has a direct impact upon the sustainability of better economical conditions of the people. Therefore, the connection between poverty and the sustainability of the rural transportation network should activate a strong interest of the communities, leading to active participation and consequently communities will always be aware enough of the facts previously mentioned.

2. ACCESSIBILITY AND PLANNING OF THE DEVELOPMENT OF RURAL ROAD NETWORK.

2.1. Introduction to accessibility and mobility planning.

It serves as an overview of tools and approaches that can be applied for planning rural roads for accessibility. It highlights important issues in the planning process and issues that need special attention and care.

2.2. General planning aspects

2.2.1. Planning accessibility and mobility.

The document refers to the importance of considering several aspects that hinder the sustainability of supplying and maintaining rural roads such as political, institutional, financial, economic, social and environmental aspects, as well as those concerning road security. However, one of the most important aspects is the guideline to follow in order to achieve community participation right from the start of the whole process of planning, designing, constructing and maintaining rural roads.

2.3. The Planning Process

In this section, a frame for the planning process which sets down the principles and approaches for multisectorial participative planning is proposed, coming to the conclusion that without an integrated approach between transportation infrastructure and services, the investments in transportation are highly unlikely to contribute to economic and social benefits to the people, which is why it is necessary to implement policies and strategies for rural roads in the national plans.

2.4. Planning tools

Existing planning tools in the market are shown; coming to the conclusion that only a few are appropriate for rural road planning, emphasizing the following:

- ASPIRE is a new assessment tool on the market and it has been tested in countries such as Kenya, Zambia, South Africa, Sri Lanka and the US.
- Basic Access Approach (BAA) - developed by the World Bank - adopts a holistic view in understanding mobility and accessibility needs of rural communities. It enables road authorities to adopt an approach in managing road infrastructure considering both national and rural roads.
- Integrated Rural Accessibility Planning (IRAP) – developed by the International Labour Organization, is a tool for including rural transport interventions as an integral part of rural development and focusing on the mobility and access needs of rural communities. It involves a process that enables road authorities to accommodate the accessibility needs of rural communities in road infrastructure management.
- Integrated Rural Mobility and Access (IRMA) – developed by the Council for Scientific and Industrial Research (CSIR) for the Rural Transport Strategy in South Africa. It provides a framework for planning, designing and implementing rural transport infrastructure interventions with environmental sustainability as the foundation.
- Participatory Rural Appraisal (PRA) – developed by the World Bank. It aims at increasing the stakeholder participation in the context of development initiatives and to enable development practitioners, government officials and local people to work together to plan appropriate work programmes. It uses a wide range of simple methods to enable people to express themselves and share information, and visual methods are common.
- Sustainable Livelihood Approach (SLA) – developed by DFID - provides an improved way of thinking about the objectives, scope and priorities of development that will better serve the needs of the poor at both project and policy levels; it enables road agencies to provide rural transport infrastructure in a manner that more optimally addresses the needs of the poor.

2.5. Recommendations to planners

This final chapter provides planners with guidance on how to work with local communities and stakeholders. It lays out some basic principles and states what has to be done and how to do it – this could serve as a checklist for planners. It concludes that effective participation is created when different needs and interests are taken to account by the planners.

3. SUSTAINABLE MAINTENANCE OF RURAL ROADS

3.1. Importance of rural roads maintenance

Minor rural roads are usually the last to be accounted for in the transport network and, therefore, are considered greatly inferior to major paved roads. However, rural roads play a crucial role in the economic and social development of societies, linking rural communities to education, health services and market.

Rural roads maintenance is therefore critical to ensure adequate access and mobility to rural populations. Agencies in charge of rural roads maintenance have difficulty developing effective engineering solutions to address the functional requirements of all-weather access and selecting low-cost solutions to build and maintain an extensive network. Given the low level of traffic on these roads, it is usually economically unfeasible to pave rural networks, especially in developing countries where budgetary limitations prevail.

3.2. Socio-Economic Importance of Rural Roads Maintenance

It is a known fact that the lack of well-maintained roads generally increases transportation costs; as a result, local and national economies are hampered. Moreover, public and utility services experience difficulty providing for rural communities, particularly in regards to health and education, resulting in an inestimable cost to human development.

As it has been mentioned, one of the fundamental objectives of road maintenance is avoiding the loss of invested capital through physical protection of the infrastructure and road surface. Maintenance entails avoiding destruction of road structure stretches as well as subsequent rehabilitation or reconstruction.

3.2.1 Economic Benefits (Evaluation)

Recent studies have evaluated the positive impact of rural roads investment and development in poor countries. In Asian and African countries, studies have demonstrated a close relationship between the extent of the road network and expenditure on roads with income growth. In India, a study found that expenditure on rural roads presented the most positive impact on rural poverty reduction and income growth.

Regarding education and health, studies held in Pakistan [16] and Morocco reveal that the presence of an all-season rural road in a village is associated with higher school enrollment rates, improvement in education quality, higher use of health services, higher immunization levels of the population and more births assisted by a skilled attendant.

In regards to economic growth, it was demonstrated in China that every yuan invested in rural roads resulted in an increase of 5.68 yuan of rural non-farm gross domestic product (GDP) and 1.57 yuan of agricultural GDP [17]. In Vietnam, a positive correlation between the level of economic activity and the extent of the rural road network was observed. It was found that, for every dong invested in roads, 3.01 dong of agricultural production value would be produced.

Due to the benefits that roads have on the social and economic development, it is clear that an efficient road management does not only improve transportation, but also promotes the basic development objectives.

3.2.2 Socio-economic Indicators and Impact Analysis

The socioeconomic impacts of rural roads can be divided into direct (primary) effects and indirect (secondary) effects. The objective of socioeconomic impact analysis is to assess the magnitude and distribution of both direct and indirect effects. Primary effects are the directly measurable traffic-related effects, like reduced travel times and savings in vehicle operating costs (VOC). The indirect effects of road improvements consist of increases in income and other dimensions of well-being such as health, education, social interaction and political participation. These effects are related to social benefits (secondary effects) and are difficult to measure and isolate from primary effects. Therefore, special attention should be given to avoid double-counting when performing socioeconomic impact analysis

Several studies have been carried out in developing countries to assess the impact of rural road maintenance projects. For examples, projects have been carried out in Morocco, Peru, Brazil, Vietnam and Tanzania, in partnership with the World Bank, Asian Development Bank and other organizations. The findings in many cases have been limited due to the lack of available baseline or control data. Overall, it has been difficult to identify the comprehensive benefits achieved from the specific projects. In essence, they focus on just one aspect and they do not effectively integrate findings.

3.3. Rural road sustainable maintenance practices.

3.3.1. Operational methods for maintenance practices.

The guides and manuals from the series, "Routine road maintenance with micro enterprises" are specifically oriented to promote routine management of secondary and minor roads based on micro enterprises, between national or regional governments and municipal administrations responsible for fulfilling that function. These manuals are important due to the increasing decentralization of road management responsibility since the end of the 1990s.

Experiences of this nature related to the significant impacts of rural roads and the social benefits obtained in India, Brazil, Venezuela, Colombia, Peru, El Salvador, Ecuador, Guatemala and Canada are described in the document.

3.3.2 Procurement Process

Key Factors

The current financial system and the implementation of road maintenance have been clearly identified as the roots of the problem in the maintenance of sustainable rural roads. In the vast majority of the countries, a sufficient fund flow cannot be guaranteed due to the financing procedures of the general budget. Besides, the rules and regulations of the public administration system do not allow an efficient management of the roads. In the same way that it is highly unlikely that substantial and sustainable improvement can be done to the system, a new approach is necessary in order to eradicate this problem.

The maintenance of roads is politically unappealing; the construction of new roads or social programs generates a greater political prestige. In addition, the lack of a maintenance culture and the lack of understanding of the economic consequences of an inadequate maintenance, even by the people in charge of these roads, make it even more difficult to get enough maintenance funds.

3.3.3. Financing Methods

Road funds in Central America

In Central America, the creation of road funds has been intensely promoted in the last few years. In 2000, maintenance road funds have been legally created in Nicaragua and El Salvador, in addition to those in Guatemala (1997), Costa Rica (1998) and Honduras (1999). Other funds exist in Bolivia, Ecuador and in the Asian countries: India, Jordan, Kazakhstan, Mongolia, Uzbekistan, Laos, Nepal, Pakistan, Afghanistan and the Philippines.

3.3.4 Decision Making

From experiences acquired over the years in Latin America as well as in other regions, it can be concluded that establishing a new road preservation model is a priority, mainly based on the preventive method. Strategies must be highly contextualized to local needs and circumstances to determine the most adequate management model.

3.4. Tools for Sustainable Maintenance

3.4.1 Database

A database is an integral tool to create a sustained road maintenance plan. The information therein allows one to clearly analyze not only the function of the roads, but also their socioeconomic impacts according to their operational levels. Once impacts are analyzed, one can prioritize needs and structure short, medium and long-term action plans.

The consideration of socioeconomic criteria into road planning is a paradigm shift from traditional practices. The new paradigm emphasizes placing rural road planning into a comprehensive national plan to connect rural communities to main city centers.

3.4.2 Road Indicators

Indicators have to consider the age of the roads, length, technical data from its construction, the kind of land it located on, as well as geological characteristics, vulnerability to weather agents, traffic density, localization of coated banks and their availability, physical conditions of each one of them and their maintenance, restoring or reconstruction track record.

According to modern road planning, the purpose of roads is to connect people to production, markets and services. In other words, road organizations must move away from traditional practices and reconceptualize their business from a socioeconomic perspective.

3.4.3 Methods

From the consultations made so far, the method developed in Peru and Ecuador is considered to be the most thorough. The method is based on integrated road management, whose objective is to define a long-term road plan and in which both the planning and the cost of the road actions involve the contribution of the users' and beneficiaries' organizations.

3.4.4 Alternatives Analysis

Based on the above research and analysis, the most important factor that ensures a sustained maintenance of rural roads is a sufficient and permanent financing source. A minor exception applies to microenterprises that operate in the influence area of the road or roads in question, which obtain financing through private means.

Given the unique conditions in each country, each will define its own action plans and methods that will enable them to implement road maintenance plans in the short, medium and long-term and improve the lives of their citizens.

3.5. Cases Studies

Several Latin American countries such as Venezuela, Colombia, Bolivia, Peru, Nicaragua, Ecuador and Guatemala among others, have established a pilot plan of a road maintenance technical management model. The pilot plan was drafted with support from a number of world and local organizations, namely the International Labor Organization (ILO) and the Colombian Public Works and Transport Ministry (MOPT), and sponsored by the United Nations Development Program (UNDP). This model is based on the operations of specialized microenterprises, which are focused on the use of labor-intensive methods and have low setup and operating costs, thereby making it a viable alternative to the more expensive conventional systems of maintenance equipment.

This new road management model is supported in a series of ILO publications for their project, "Promotion of employment intensive technologies in public investments in Bolivia, Ecuador and Peru", which operates with resources from Denmark. The project has the objective of studying and spreading methodologies based on labor-intensive approaches. Moreover, the project is registered within a wider ILO policy implemented through the Employment-Intensive Investments Program (EIIP) operating in three continents (Asia, Africa and Latin America).

3.5.1. Successful Experiences

In this section, several successful experiences in different countries (such as Nicaragua, India, Vietnam, and Bangladesh) are related.

3.5.2 Sustainability in Investments - Successful Practices

Without a doubt, positive outcomes from routine road maintenance through microenterprises depend on budget resource availability. Unfortunately, budgetary resources in most of the Latin American countries and other continents are often not sufficient; therefore, maintenance stability is uncertain.

Hence, sustainability of road maintenance is considered an ongoing problem and an opportunity to study and experiment in a contextualized manner.

3.5.3 Experiences in Latin America

The international cooperation program involving the International Road Federation (IRF), the German Agency for Technical Cooperation (GTZ), and the United Nations Commission for Latin America and the Caribbean (ECLAC) that is being carried out in Costa Rica by the Ministerio de Obras Públicas y Transportes (MOPT), promotes best practices for road maintenance in Latin American countries. They emphasize the implementation of road maintenance funds that are sustainable over the long-term and have stable resources. Therefore, the program suggests financing be procured from the users for maintenance service. The programs that follow this template show progress that is encouraging.

Mexico has taken important measures in order to structure the new preventive maintenance model and its sustainability over the years. In 1990, an agreement was made to transfer all rural road network maintenance tasks (171,000 km) from the federal government to the provincial governments. In 1995, the Mexican federal government had structured a temporary job program, by means of which an important financial resources fund had been designed to restore, to rebuild and to preserve a significant number of rural roads in all the federative entities in the country, with the purpose of:

- Generating jobs in extreme poverty stricken and highly marginalized areas, thereby boosting the economy and the incomes for the individuals therein;
- Keeping an optimal service level in the rural network of the country, thereby supporting provincial governments; and
- Encouraging investment in rural road network maintenance in some of the most isolated regions.

To achieve those goals, Mexico put into practice a new strategy for rural development by micro-regions to ensure adequate planning and to dedicate resources to construction, maintenance and reconstruction works for roads found in those areas.

4. INVOLVEMENT OF LOCAL COMMUNITY IN RURAL ROADS.

4.1. Background of Community Participation in Infrastructure

The limitations of top down planning and implementation of development programmes and projects came to be appreciated by governments and development experts only after decades of experience on the ground. As public investments in many sectors expanded, and much foreign aid was absorbed by governments, evaluations showed that often the intended outcomes of projects were not fully achieved. In many completed projects, it was found that unintended consequences such as environmental damages had taken place leading to enormous social costs that were overlooked in accounting.

A sense of partnership and ownership of projects on the part of local communities was thus seen as a positive force for the outcomes of development projects to improve. Over the years, governments have learnt that communities can complement and strengthen their efforts to accelerate the pace and quality of development.

4.2. The importance of community involvement

People living in rural areas are dependent upon the surrounding environment for their livelihoods, mostly subsistence farming. Rural roads are a lifeline for these rural communities, but the problem with earth and gravel roads is that they deteriorate rapidly in the wet season, disrupting transport services and restricting access to health centers and markets when this is most needed.

Villagers have a strong and long-term interest in land issues and they are able to contribute local knowledge to identify environmental impacts, monitor on site operations and help in the design and long-term evaluation of mitigation measures. Hence it is essential that local communities are involved in the entire cycle from identification, planning and design to implementation and monitoring. Consultations and collaborations with local stakeholders will maximize the potential and sustainability of a project. These local voices must be heard in the planning and implementation as well as in the ongoing ownership and maintenance of the road network.

4.3. Need for Participation of Community and its Scope.

The participation of the communities is highly important in all the projects of rural infrastructure, in the sense that this participation means an active participation in an activity or a shared activity. If the community is kept ignorant of a basic community asset and are kept away from major decisions about the community asset without their participation, the use of public funds for creation of such community asset cannot be fully justified.

4.4. Practices of Community Participation

Many efforts have been made in order to compile some of the significant practices of community participation in rural roads, which are related as follows:

Guidelines for Planners and Engineers in Community Participation in Maintenance of Roads, August, 2003 by DFID:

These Guidelines prepared by IT Transport Limited, Consultants in Transport for Rural Development for the DFID have been perceived as a significant effort towards structured community participation in road sector; practices of community participation have been started from these Guidelines

UNDP Experience of Integrated Rural Accessibility Planning and Community Participation in Rural Infrastructure Development in Vientiane, Laos:

Cris Donnges, International Labour Organization has published Issue Paper 4 on Integrated Rural Accessibility Planning and Community Participation in Rural Infrastructure Development in Laos (1996-1999) for the Ministry of Communications, Transport, Post and Construction, Rural Development Committee. Government of Laos, Vientiane

The Latin American Experience of Micro Enterprise Based Routine Maintenance :

Serge Cartier van Dissel, Consultant in Road sector presented a paper on 'Microenterprise Based Road Maintenance - The Latin American Experience' in PIARC International Seminar on Sustainable Maintenance of Rural roads at Hyderabad, India in January 2010.

Case Study on Community Involvement in Maintenance of Rural Infrastructure in Sri Lanka and Nepal, by Practical Action South Asia:

Ranjith de Silva, Regional Coordinator for Asia and the Pacific, International Forum for Rural transport and Development (IFRTD) presented a paper at the PIARC International Seminar on Sustainable Maintenance of Rural roads at Hyderabad, India in January 2010.

Community Participation in Planning and Implementation of Rural Roads - A case study ADB Timor-Leste Road Sector Improvement Project:

Francesco Tornieri, Social Development Specialist (GAD), RSDD and Marcelo Minc, Principal Project management Specialist, EARD, Asian Development Bank.

Community Involvement in Burkina Faso: The experience of community involvement in Burkina Faso as presented by Amadé Ouedraogo, Burkina Faso.

Citizen Monitoring and Audit of Rural Roads under Prime Minister's Rural Road Programme in India:

Public Affairs Centre, a Bangalore based Civil Society Organization has presented a Report on 'Citizen Monitoring and Audit of PMGSY Roads: Pilot Phase II in July 2009.

CONCLUSIONS

Regarding the importance of rural road maintenance, the main conclusions are:

- Rural roads play a crucial role in the economic and social development of societies; therefore, rural roads maintenance is critical to ensure adequate access and mobility to rural population;
- It is necessary that governments facing maintenance road problems adopt viable (technical and financial) solutions that contribute to providing sustainability to road management.
- Recent studies have evaluated the positive impact of rural roads investment on development in poor countries. These studies show that one of the best investments for a country is, without a doubt, road maintenance sustainability.
- Recent studies identify the nature of various social benefits, how they can be measured using indicators (such as the Rural Access Index) and how they can be included in the appraisal process.

For the developing countries, adequate financing and management decentralization are not enough. The fiscal decentralization is necessary, in addition to the central government subvention. It is also necessary to implement an adequate and regular source for financing the investments within a frame of appropriate regulations: the design of rural roads is often complex, promoting a waste of money and resources which results in roads with inadequate and easily deteriorated slip roads.

It is important that the local actors take over the maintenance projects, otherwise they won't feel committed to or responsible for the roads they use. Once local communities have participated in the earlier stages of the process of the project, it is more likely that the maintenance works are addressed in a more efficient way. But there must be financing mechanisms. Without financing there is no maintenance, and without financing there are no roads.

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