# EMPOWERING RURAL POOR THROUGH ROAD CONSTRUCTION: AN EXPERIENCE FROM HILE-BHOJPUR FEEDER ROAD PROJECT, NEPAL

Indu S. Dhakal
Department of Roads, Government of Nepal
ISDHAKAL@WLINK.COM.NP

## ABSTRACT

Poverty is most severe in rural hills of Nepal which could be attributed to the lack of physical access. With an aim to reduce rural poverty, Government of Nepal decided to construct a road using labour-based approach. Rural accessibility planning was used for route selection and justified economically. Community contracting system involving Road Building Groups from the immediate zone of influence is used for the road construction. Group members are selected from poorest and socially excluded people with at least thirty percent women members in support of the women empowerment. Engineering consultancy is employed to supervise construction work whereas local NGOs are responsible for socio-economic development activities. Various trainings are given to the members to enhance their livelihoods. Members are saving at least ten percent of their wages for income generation and enterprises development activities which are proved to be effective tools for poverty reduction. The ownership feeling towards road is increasing which will help for future maintenance and sustainability of the road. Slow progress in construction is the main constraint of the project. Department of Roads is now in a process to develop a labour-based, community contracting guideline to enhance the poverty reduction impacts from rural road construction.

## 1. INTRODUCTION

### 1.1. Background

Being landlocked, Nepal is in dire need for an efficient and reliable road network for its socio-economic development. However, inadequate road connectivity, especially in the northern hills is its major development constraint that dissociates the rural communities from the basic social and economic services. As 40 percent of the hill population are still more than 4 hours walk from all-weather road, the Nepal government's one of the key developmental objectives is to improve the country's road network, as per the strategic plan endorsed in the country's Tenth-Five Year Plan (2002-2007). The country's Transport Sector Policy also emphasises on reliable, cost effective, safe and sustainable transport system that promotes the maximization of economic, social, cultural and tourism development as a whole. For the achievement of this objective the policy has three broad strategies:

a) Central level road networks to be built and maintained by central authorities;
b) Local roads shall be constructed and maintained by local authorities; and
c) Encouraging the private sector in construction and maintenance.

Road network in Nepal is divided into Central Road System and Local Road System as per the National Transport Policy of the country. The Strategic Road Network as per DoR classification is a part of the Central Road System. This System is administered by the DoR and the implementing agency is the Ministry of Physical Planning and Works. The first motorable road was constructed in Kathmandu valley in 1924, and the first road that

connected Kathmandu Valley was built in 1956. In the early 1950's roads in Nepal were constructed primarily as an entry point to the development of the country. This concept existed till the mid 1970's. Thereafter road construction was based on economic and financial returns. However, with the experience that only the better-off people were benefited from such roads, but not the poorest. The objective on road building shifted more or less towards reducing poverty after the mid 1990's. The Government of Nepal has proposed a Poverty Reduction Strategic Paper focussed on road construction using a 'Transport Plus' approach that incorporates socio-economic development aspects.

The Strategic Road Network (SRN) is a backbone of the national road network system. It consists of 15 National Highways and 51 Feeder Roads. The SRN occupies about 33 percent of the national road network system and plays a very important role in movement of goods and services in the country. Feeder roads in Nepal are the lower order of national road system, mainly linking the district and zonal headquarters to the national highways; and from national highways to the major places of industry, tourism, public utilities and power generation, etc. A number of local roads radiate off them to improve rural accessibility (especially access to markets, employment, and education, health and social services) in an environmentally sustainable and socially responsible manner.

A total of 17280 Km roads have been constructed in Nepal in the last four decades. The percentage average road density is 11.7 km/100 sq km and the density is 1340 persons/km. Such low densities indicate a very low accessibility. Many rural communities remain isolated and dependent on animal and head-load transport. The road access up to all district headquarters is also a challenge to the Department of Roads. There are still 15 district headquarters which are yet to be connected by roads. The figure below summarizes the statistical development of roads in Nepal and provides a glimpse related to its increasing trend.

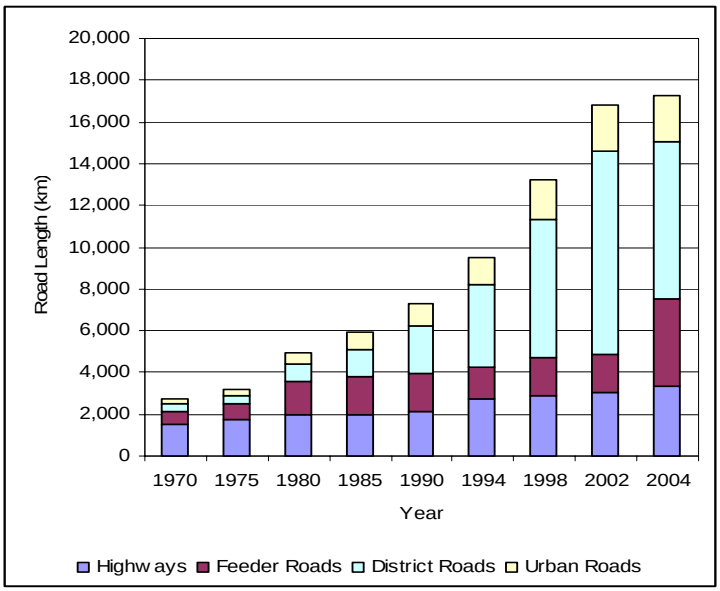


Figure 1 – Growth in road network

## 1.2. Rural Access Programme and Poverty Reduction

Poverty remains concentrated among the rural poor and women, and various disadvantaged ethnic and caste groups. While there has been some progress in addressing gender-based discrimination, however there are much to be in addressing caste and ethnicity-based exclusion. Conventional road projects have not always been

sufficient to reach the most disadvantaged groups. Enabling the deprived to access opportunities and benefits from development efforts in the country is therefore, essential.

Rural Access Programme (RAP), which is a pro-poor, pro-livelihoods innovative road development project, could be taken initiatives to reach the most disadvantaged groups in Nepal. Its goal is to promote “more secure and sustainable rural livelihoods for poor and disadvantaged people in the Nepali hills” through improved access to goods, markets and services that they value in targeted hill areas. By the end of the programme, 70% of the population of districts will be within half a day’s walk of a road; and half of the road building groups will become effectively involved in development activities in their own villages during and beyond construction. The programme design is based on the recognition that for a significant impact on poverty reduction, infrastructure alone is not enough and that complementary interventions are required if the poor are to benefit significantly. The programme is committed to identifying vulnerable individuals and groups, and strengthening their capabilities and livelihoods through specific interventions. These are designed to allow poor and excluded women and men to take advantage of the longer term benefits provided from improved access. The intention is to use short-term employment opportunities in road construction activities as a basis for making poor peoples’ livelihoods more sustainable. The project has stabilised social mobilization and awareness programs by paying for the social cost involved. The saving from their income provides them to engage in basic economic activities, such as livestock raising, micro business, and small-scale agriculture. The project also conducts awareness raising, literacy classes, skills development, and job training to improve the households’ capacity to decide on matters relating to their family members' lives and develop livelihoods in the long term. The project complements which aims to facilitate a process of economic and social empowerment among poor women.

The physical barriers are the terrain, transport infrastructure, transport modes and transport services, while the non physical barriers are the social (economic, social, political, cultural) ideas, attitudes and practices which prevent people from gaining 'real' access to whatever (goods and services, or anything else) they value. It is necessary to distinguish different processes whereby non-physical barriers are created and perpetuated: discrimination, exclusion, marginalisation, oppression, exploitation. The programme will address these barriers individually, cooperatively or collectively and will find ways of eliminating, reducing or mitigating the effects of coping with these barriers.

## 2. PROJECT DESCRIPTION

### 2.1. Road Construction Component

Bhojpur district has no roads and is not connected to any road system of the country. Foot trails are the only means of transport in the district at the moment. After feasibility studies of several alignments, it was decided to construct a feeder road from National Highway to the district headquarter. The alignment was selected taking into account: (i) the development objectives set out in the Tenth Five-Year Plan; (ii) the demand for access in the area and the road prioritization as per the DoR’s 20-year Master Plan; (iii) the cost-effectiveness of the individual road; and (iv) the detailed geotechnical survey of the road.


Figure 2 – Project location map

Hile Bhojpur Feeder Road Project (HBFRP) is being implemented under Rural Access Programme with the grant assistance of Department for International Development (DFID), United Kingdom. The United Kingdom has contributed US$ 8.50 million equivalent and Government of Nepal will share US$ 2.00 million toward the project's total estimated cost of US$ 10.50 million. The total road length is 92 km. The project uses a combination of labour-based construction and civil contracts. It follows environmentally sound techniques using Green Road concept. The earthen track of the first 26 km section from Hile to Leguwaghat, was opened by the Royal Nepal Army in 2001. The Leguwaghat -Bhojpur section which is 66 km is a new construction. Works on this section is being done using Road Building Groups (RBGs), and the civil contracts will be used only for difficult sections and structural works. The Hile-Leguwaghat section of the road starts at an altitude of 1950 m on the ridge of Hile and descends to Leguwaghat by the Arun River, at an altitude of 250 m. The international consultant is responsible for project management and national consultants were selected and engaged to supervise the construction activities. Local NGOs select RBGs in consultation with the consultant. They are responsible for the social and economic development of the groups. The project commenced in June 2003, with expected completion by June 2008. The project aims to develop an efficient, safe, reliable and environmental friendly road transport system; to improve rural village's access to markets, income-earning opportunities, education and health services, and social activities.

2.2. Enhancing and Protecting Interventions Component

The communities are well informed about the project, involved in decision-making on issues that affect their lives, and made aware of the opportunities arising from the road construction. Enhancing and Protecting Intervention (EPI) activities are implemented by social mobilisers managed by NGOs. Social and Economic Development Officer provides the specialist advice. Social and economic development is achieved through three types of interventions:

### *2.2.1 Protecting Interventions*

Protecting interventions protect the local communities and households, in particular the poorest and excluded, against any negative impacts (physical, environmental and social) that may occur during road construction activities. These include the following activities:

a) Inform about the potential impact to project affected families;
b) Resolve issues of compensation for affected households;
c) Launch alternative livelihood support for poor and excluded;
d) Raise awareness on the health, safety and social costs of alcohol, gambling, etc;
e) Establish public audit systems; and
f) Ensure social welfare of road building groups.

### *2.2.2 Enabling Interventions*

Enabling Interventions are intended to reduce barriers, which may prevent them, taking direct advantage of project related benefits. These contain RBG mobilisation activities which ensure labour is mobilised, trained and available for construction work; and Social Equity activities which address issues of equity and ensure that the practical and strategic needs of the poorest and excluded are addressed. These include the following activities:

a) Encouraging consensus in local level decision-making;
b) Communicate with politicians, road building groups and the local communities;
c) Promote transparent decision-making within the programme;
d) Witness labour payment for work;
e) Challenge discrimination against women or excluded groups in wages or work;
f) Maintain a minimum 30% women workers (including facilitators and supervisors);
g) Ensure consideration of issues of child labour and child care;
h) Raise awareness on benefit of education to women and socially excluded;
i) Provide information and training in savings group formation;
j) Support provision of literacy / book-keeping; and
k) Provide first aid equipment and training.

### *2.2.3 Enhancing Interventions*

These interventions ensure that the poorest and excluded people can benefit from the wider longer term social and economic opportunities the road may bring. These include the following activities:

a) Promote the establishment of revolving funds for RBG;
b) Provide information on income generating opportunities;
c) Support co-operatives with information/training;
d) Liaise with marketing organisations to promote increased trade;
e) Provide support to village level organisations in development planning;
f) Build capacity for excluded groups to voice their needs (communication skills, leadership skills, confidence building, advocacy);
g) Provide two-way channels of information flow to inform access decisions; and
h) Share findings of accessibility database with local community.

2.3. Project Implementation Arrangements

The Project Management Office has been established in field headed by one Project Manager. Programme Management Unit (PMU) which is based in Kathmandu is headed by the Programme Manager which provides support and assistance in the implementation of the project. One engineering consulting firm is deputed for construction supervision work, and two local NGOs are responsible for socio-economic development activities. Other local-level institutions involved are:

a) District Development Committee (DDC): At the district level the DDC implement the integrated accessibility and physical planning approach.
b) Village Development Committee (VDC): VDCs coordinates village level infrastructure planning and mediates disputes related to alignment and land acquisition
c) Local Road Co-ordination Committee (LRCC): Nine LRCCs are formed one in each VDCs. The function of these committees are to facilitate the program in local level, witness the measurement and payment when necessary, help to resolve the local level conflict, facilitate in compensation etc. Other roles and responsibilities are to facilitate the local level planning and implementation, support the formation of Road Building Groups and conduct public audits.
d) Road Building Group (RBG): 123 no of groups are formed with 15 to 20 members selected using criteria prioritising the poorest and socially excluded with more than 30% women members within the immediate zone of influence of the road. Their main role is to construct roads to agreed standards under the guidance of supervisors. Each RBG will have a facilitator elected from within the group. The RBGs will work with facilitation support from the NGOs, and engineering consultants who are contracted for their services.

## 3. ENGINEERING APPROACH

3.1. Alignment Selection

Accessibility Planning is a transport planning methodology that has been developed for rural areas which is considered a valuable tool. From this, one can identify settlement level accessibility problems and be able to prioritise with the most serious problems. The planning task is to integrate Accessibility Planning with District Transport Master Plan (DTMP) and other sector master plans in order to achieve an integrated physical planning approach at district level. The key to doing this is through the concept of accessibility, as the level of difficulty people have using, reaching or obtaining the necessary goods and services they require. The activities for accessibility planning include the following steps:

a) Collection and reviewing of secondary data of potential areas and status of rural roads;
b) Preparation of Indicative District Potential Map based on above data;
c) Plotting of Inventory Map of Rural Road Network that include trails, bridges and roads;
d) Hiring and Training of Enumerators for data collection using the questionnaire;
e) Carry out accessibility survey in each settlement and market centre of the districts;
f) Calculation of Access indicators of settlements and market centres using r software;
g) Preparation of Accessibility Profile and GIS Maps based on above access indicators;

h) Organisation of area workshops;
i) Preparation of Perspective Plan of Facilities and Services;
j) Preparation of Perspective Plan of Rural Roads; and
k) Preparation of DTMP.

The alignment selection was prioritised on the District Transport Master Plan. The objectives was to select technically, environmentally and socio-economically the most feasible route among the alternatives. Route of the corridor was identified through participatory transport planning procedures on the basis of pro-poor, socio-economic, environmental and engineering feasibility considerations, Due attention was given to maximise mass balancing horizontally as well as transversely during field survey and design.

### 3.2. Green Road Concept

The project has adopted the Green Road Concept with a number of refinements and revisions based upon a critical review of previous experience. Preference for alignment selection is to place the road centre line at or as near as possible to the hill slope surface to maximize mass-balancing within the cross-section in order to minimize excess cut or fill. This also applies to longitudinal mass balancing where the mass haul is optimized. The key features are participatory methods using appropriate labour-based technology. Labour Based Approach to construct feeder roads using RBGs shall be limited to:

a) Earthworks activities;
b) Drains and side drain structures;
c) Retaining Walls and Breast Walls; and
d) Bioengineering works

Labour-based approach, which is also the policy of Tenth Five-Year Plan aimed for reducing the rural poverty through employment generation and retention of benefits within the immediate area of Project. It also allows work to be undertaken concurrently over several sectors along the alignment. This approach is also appropriate in fragile hill environment resulting in a reduced environmental impact spread over a longer period of time, and in turn allows the new construction to settle better into the landscape.

The labour-based approach avoids using machine and mechanized equipments, blasting as far as possible. It carries out entire construction activities through manual labour. The policy to hire labour from local area is intended to provide them extra income opportunity through working in the road construction. This will also generate an ownership feeling of the road among the people. Department of Roads is developing a Labour-based and Community Contract Approach Guideline to work with the poor and excluded people and co-ordination with secondary stakeholders to reduce poverty.

### 3.3. Phase Construction

This road has been planned and constructed in a phased manner to minimise environmental disturbance. Phase construction allows maximum flexibility, which is crucial in responding to changes in physical circumstances as they develop. Local people are employed, to the maximum extent, in their construction.The standard followed for design

and construction is the Standard for Feeder Road adopted by Department of Roads. The design and construction will also incorporate certain approach as following:

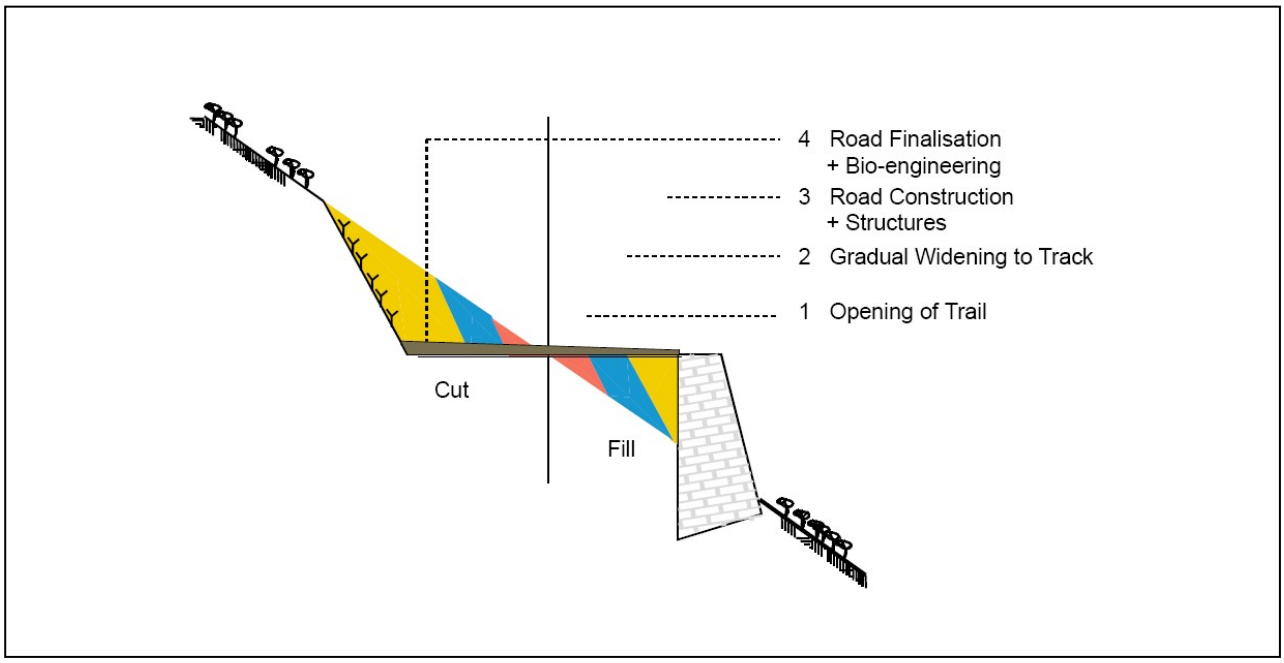


Figure 3 – Phased construction

a) Simultaneous design and construction;
b) Phased construction technique;
c) Cut and fill method for mass balance;
d) Priority on soft engineering structures;
e) Incorporation of bio-engineering;
f) Adopt labour-based construction methods and small contracts;
g) Use local labours drawn from immediate zone of influence; and
h) Environment friendly roads.

Width of road is opened only 2.5 m wide at the beginning. It is gradually widened to 4.5 m after one or two rainy season. The road is then upgraded to all weather gravel standard. The construction materials are locally available for construction of low cost soft structures such as dry masonry walls, gabion walls and causeways at critical sections.

### 3.4. Environment Safeguard Policies

Environmental Impact Assessment (EIA) study was performed to assess the likely impact on the environment and to offer recommendations to make the road environmentally and socially sound and sustainable. The EIA report is quite broad and covers various aspects of the physical, biological and socio-cultural-economic environments. It forms a legal obligation under the Environment Protection Act 1998. The EIA includes:

a) Documentation of environmental baseline information of the project influence area;
b) Analysis of positive and negative impacts;
c) Recommendation of appropriate preventive and curative mitigation measures; and

d) Environmental and Social Management Plan to implement the mitigation measures

The main environmental impacts during road construction are (i) permanent loss of the agricultural land, forest and grazing land (ii) earthwork and cut-slopes, change in land use, spoil disposal, stockpiling of the construction material, operation of quarries, disruption of drainage (iii) dust nuisance, road safety issues, slope instability and erosion from drainage. Land and property loss is the major immediate socio-economic impact. Damage to other community infrastructures, damage to places of religious importance and cemeteries, dropout from school for working, accidents during construction work, increased alcoholism and prostitution due to increased income from construction work as well as increased trade and commerce after improved access are other negative socio-economic and cultural impacts.

Considering the environment friendly approaches during construction, it is not anticipated that there will be any unanticipated adverse impact. The Environmental and Social Management Plan developed will address the problems with suitable mitigation measures. The project's environmental policy is to go beyond simple mitigation of negative impacts wherever possible. In order to make the physical intervention compatible with the fragile ecosystem, bioengineering and other locally used measures will be adopted. Environmental monitoring will be done periodically to ensure mitigation measures comply with the identified problems. It is the responsibility of DOR to monitor and ensure that it is complied with the recommended mitigation and monitoring measures.

3.5. Bio-engineering

As an environmentally compatible and cost-efficient alternative for roadside management, bioengineering has become increasingly important and attractive. Bioengineering uses live plants and plant parts as building materials for engineering solutions to erosion control, slope stabilization, landscape restoration, and wildlife habitats. However, not all decision makers are aware of the specific benefits of this approach. Bioengineering treatments are cost savings, along with other environmental benefits, as compared to traditional roadside geotechnical solutions. Bioengineering methods could be adopted to produce equal or better economic and environmental results because it is an efficient and environmentally beneficial tool for roadside management. HBFRP have extensive scope for bioengineering since it is incorporated in the design.

## 4. SOCIO-ECONOMIC DEVELOPMENT STRATEGY

The Socio-economic development objective of the project is to support rural residents to utilize rural transport infrastructure and services and benefit from enhanced access to social services and economic opportunities The Project emphasises on the sustainable improvement of poor peoples' livelihood. The direct beneficiaries are 2500 RBG families from the rural poor, whose livelihoods are tied to agriculture and are vulnerable to widespread food insecurity. Objective will be achieved through three types of interventions:

a) Direct employment in construction;
b) Saving credit activities from group saving; and
c) Micro-enterprise activities.

Major activities of the social mobilisation are to train the RBG members on group management, leadership, saving and credit, first aid, literacy, gender, conflict management etc. Saving and credit schemes are done from the money they earned from the road

construction. Further economic development programs will be introduced at around the end of the construction programme. Small-scale income generation activities are being done using the saved money.

### 4.1. The Labour Availability Survey

The labour availability survey was carried out in February 2003 and the baseline survey was carried out in August 2002. The population of Bhojpur district is 204,716 with 39,687 households. There are 63 Village Development Committees. The majority of the population is dependent on agriculture. The Labour Availability Survey (LAS) has two objectives. Firstly to determine the labour needed for specific construction work and secondly to identify the eligible households so that they can be offered the opportunity to work on the roads. The outputs are:

a) Collection of the specific data within the Zone of Influence for verification;
b) Identification of livelihoods likely to be affected positively or negatively;
c) A representative profile from identified settlements;
d) Recommendations on the adequacy of workers and composition of RBGs;
e) Identification of the poorest people, the most excluded and those with dependents; and
f) Indicate most appropriate seasons for construction on a location specific basis

The total population within the LAS was 10,682 in 1,766 households. There are 6478 labourers (49% women) available within this population of which only 3.5% are skilled. The project gave priority for RBG membership to economically deprived and socially excluded households, which have a high ratio of dependent people. The highest priority group was the very poor who own little or no land and are often without employment as well. They experience food insufficiency problems and are excluded from basic services like education and health for financial reasons.

### 4.2. Awareness Raising Program

Awareness raising program was conducted to inform all the stakeholders about project objectives, approach and activities. Its purpose is to enable people to understand fully the potential negative as well as positive impacts from the programme. The objectives are to help people understand what the programme intends to do, and obtain their views and clarify how they can benefit from it. The awareness campaign was focused on:

a) Help local people to obtain information throughout the project period and ensure transparency;
b) Promote ways in which awareness is increased through local initiatives;
c) Ensure that poor people know the social and economic opportunities; and
d) Ensure that beneficiaries participate actively in the planning, implementation and monitoring of the programme.

The awareness orientation was given to the district line agencies, NGOs and representatives of political parties. This was conducted along all road corridors to all households. The participation of the poor, women and socially excluded people was insured.

## 4.3. Supports to Road Building Groups

The labourers are organised in the form of road building groups. They are given assistance with organising the group, conducting regular meetings and making decisions about managing a revolving fund and small activities. To promote self-management and supervision within the group, a facilitator is selected from the group for an agreed minimum length of time to allow the role to develop. The facilitator works within the group, organises the daily work in relation to the agreed tasks, maintains record books for attendance and payments, and represents the group in discussions with other stakeholders. Arrangements are made to support childcare provision for poor households with young children. Overall management is guided by social development principles of equity, transparency and accountability.

The project is providing trainings on group management, leadership, book keeping, and functional literacy to the members during the construction period through the social mobilisers and external training specialist. The executive committee which consists of 7-11 members elected from among the members, including a chairperson, secretary and treasurer manages the savings (and credits). RBG members involved in the construction of roads are encouraged to save a minimum of 10 percent and up to 20 percent of their earnings on a voluntary basis. RBGs are responsible for the preparation of group rules and regulations. The rules and regulations will cover the criteria for prioritisation of borrowers, amount and range of loans, etc. Group savings scheme loans are meant primarily for productive activities. However, loans can also be made to meet household consumption needs in exceptional circumstances. Training is provided to RBG members, facilitator, and executive members. The group treasurer, in conjunction with the secretary and president, are responsible for maintaining the transaction record. The facilitator is responsible for record keeping.

## 4.4. Enterprise Development

Two areas have been identified for enterprise development activities-one is related to main target group, the poor; and the other is related to those who don not belong to the poor group, but whose livelihoods may be affected by the economics of the road construction in the specific areas. Direct interventions to the target group through the RBG are given in the field of entrepreneurship development, enterprise creation and development and business management. The enterprising trait will be developed among RBG members by sensitisation and motivation through training, campaigns, etc. The short-term income generating activities during the road construction period (tea/food making and sale, tool making and supply, selling of food items at the construction site, etc.) can demonstrate the effect of enterprise to them. Information about these opportunities will be disseminated to the RBG members during the community mobilisation period. Existing enterprises can capitalise on opportunities from project. Project will make interventions to initiate linkages between existing enterprises and group enterprises. The enterprise development interventions include analysis of local opportunities and potentials from the road construction.

## 4.5. Acquisition, Compensation and Resettlement Plan

The Land Acquisition Act, 1977 is the main legislation to acquire land for public purposes subject to the award of compensation at current market value. A full Acquisition Compensation and Resettlement Plan (ACRP) report has been prepared in order to

mitigate the various impacts. The Land Acquisition Directives are followed to fulfil the requirements. The Local Road Coordination Committee representatives were involved in finalising the compensation rate. The compensation rate for the land, structures, trees, etc. was fixed by the Compensation Determination Committee. The total cost of land acquisition and resettlement for the project is US$ 1.5 million.

### 4.6. Public Audit

The project is conducting one public-based audit each year. This informs all Road Building Group members about the work progress, the amount spent it, and the amount that each individual is entitled to receive. This acts as a crosscheck to the regular measurement and payment system. NGOs are responsible for conducting the audit. The social mobiliser, engineers, RBG members, LRCC members and project officials actively participate in the audit. The main objective of conducting public audit is to:

a) Maintain the transparency of all project activities including expenditure;
b) Review the physical progress and payment status in road construction work;
c) Review progress made in social and economic development;
d) Assess working environment and condition of tools, first aid and safety equipment; and
e) Discussion on issues, experiences and suggestions from people.

## 5. SUSTAINABILITY AND MAINTENANCE

### 5.1. Sustainability

The main measure of sustainability of the project is whether the road remains operational during the monsoon seasons with acceptable interruption and with satisfactory riding quality for the duration of their design lives. The sustainability of the road depends on the following:

a) The road should have sufficient traffic after completion;
b) Appropriate environment friendly technical design of drainage, structure, slope stability measures with maximum use of labour and material;
c) Adequate financing arrangement for road maintenance; and
d) Capacity, policies and techniques in implementation of maintenance system.

The DOR is responsible for maintaining the sustainability of the road. The technical, operational and managerial capabilities of DOR should ensure it. Furthermore, the Government is committed to substantial increase in maintenance funding and has introduced a dedicated Road Fund to improve the road maintenance. Once the road construction is complete, maintenance and operation responsibilities will be transferred to the Division Road Office of DOR. The handed over road become a part of the strategic road network and Division Road Offices take up the responsibility of its maintenance. Some of the RBG members may be employed as length persons for maintenance works, but the number will be smaller as compared to total number of RBG members at present.

Government may face budgetary constraints in funding the required level of maintenance. Additional actions to be undertaken to address these issues are:

a) Involving key stakeholders, including direct beneficiaries and project affected peoples, lawmakers and the civil society, local leaders and citizens, in maintenance activities because local support essential for road maintenance
b) Resource allocation for maintenance of the road can be improved. The private sector representation on the Road Fund Board ensures transparency and accountability in the use of funds.
c) Continue focus on addressing social and environmental aspects

5.2. Maintenance

Department of Roads still lacks the necessary institutional capacity to the effective operation of routine, recurrent, periodic and emergency maintenance operation. Furthermore, the absence of an effective roads policy and legislative framework, relatively poor construction quality and delays in the execution of works are other drawbacks. The responsibilities must be clearly defined, together with simple operating procedures and lines of reporting. The most important initiative currently undertaken by the government is the establishment of Road Board Nepal has been in operation since January 2004. Its funding is sourced mainly from fuel levies (48.7%), vehicle registration fees (33.5%) and tolls (17.8%).

The road construction has a predefined period but the socio-economic development part is a continuous process. After completion of the road construction the majority of RBG members will no longer get regular income from construction. Establishing sustainable long-term post project groups and implementing an exit strategy is one of the challenges of the project. However, some RBG members will benefit from other opportunities related to road construction. They can be involved in collection and transportation of construction materials, road maintenance and can find new customers for their agricultural products.

## 6. EARLY IMPACTS

The project has piloted innovative approach in rural road construction that successfully reached the poorest of the poor. After 36 months of operations, the project has helped 2372 households in improving adult literacy, develop their leadership skills, and consequently, increase their confidence and self-esteem.

Table 1- Scenario of project cost (US$)

| S No | Description of works | Up to Dec 06 | From Jan 07 to Jun 08 | Total |
|---|---|---|---|---|
| 1 | RBG Wages | 1,315,175 | 855,315 | 2,170,490 |
| 2 | Materials for RBGs | 127,660 | 362,354 | 490,014 |
| 3 | Contractors cost | 1,076,730 | 3,707,605 | 4,784,335 |
| 4 | Consultancy cost | 521,530 | 666,219 | 1,187,749 |
| 5 | NGOs Cost | 150,000 | 69,803 | 219,803 |
| 6 | Socio-eco development | 89,170 | 64,475 | 153,645 |
| 7 | Resettlement | 555,560 | 944,500 | 1,500,060 |
| Total | | 3,835,825 | 6,670,271 | 10,506,096 |

6.1. Technical Impacts

The earthen track of the first 26 km Hile-Leguwaghat section opened by the Nepal Army in 2001 has been upgraded to all weather gravel standard using civil contracts. The Leguwaghat -Bhojpur section which is 66 km is in construction by Road Building Groups (RBGs). From this year, civil contracts are introduced only for difficult sections and structural works. RBGs will have chance to work in slope protection and bio-engineering until June 2008. Length of road constructed and RBG wages in past three years is given in Table-2.

Table 2- Road construction and RBG wages

| Year | Road constructed in Km | | Person-days | Amount in US $ | | |
|---|---|---|---|---|---|---|
| | I Phase (2.5m wide) | II Phase (4.5m wide) | | Wages | Savings | Mean wages per person |
| 2004 | 21 | - | 64,965 | 204,905 | 20,491 | 86.39 |
| 2005 | 35 | 5 | 78,968 | 256,373 | 25,638 | 108.08 |
| 2006 | 7 | 36 | 342,033 | 853,897 | 85,390 | 359.99 |
| Total | 63 | 41 | 485,966 | 1,315,175 | 131,519 | 554.46 |

a) Community contracting system established: The system of implementing road construction works with the labour-based community contracting systems is proved to be successful. The project has gained trust and goodwill by providing employment opportunities to the poorest of the poor community. Community participation in project has also helped to develop strong local ownership.

b) Mass management and improved geometry ensured: Mass balance from cut slopes was challenging especially in steeper slopes but due to the labour based approach, excavation and spoil disposal was performed in controlled manner. The workmanships were found to be professional and neat and tidy finishing. Because of stage construction approach it became easy to improve geometric design and drainage system in the second stage.

c) Relocation of utilities managed properly: More attention was required to the areas with public infrastructures. The communities themselves were cooperative and helpful to the project regarding the relocations of public infrastructure such as irrigation channels, water pipes etc. Some religious and culturally important sites falling within the road formation were relocated smoothly with the help of NGOs and LRCC.

d) Cost effectiveness achieved: Use of local laborers and materials in construction has proved the cost effectiveness in the project. Bio-engineering is easily understood by Road Building Group members.

6.2. Socio-economic Impacts

a) Entry point for poverty alleviation: Members are getting advantage through the provision of employment. Now people understand that this approach means a big injection of cash into the local economy and a more sustainable road.

b) Saving and credit and income generation activities: RBG members have actively participated in group saving and credit schemes. Members make savings at 10% from

the payment they receive against the wages. Loan disbursements are mainly for cattle rearing, poultry, goat keeping, pigering, loan for domestic expenses and treatment of family members. Some borrowers have used the funds to start small grocery shops, set up trading activities, farm fish, and start up businesses such as tailoring, etc.

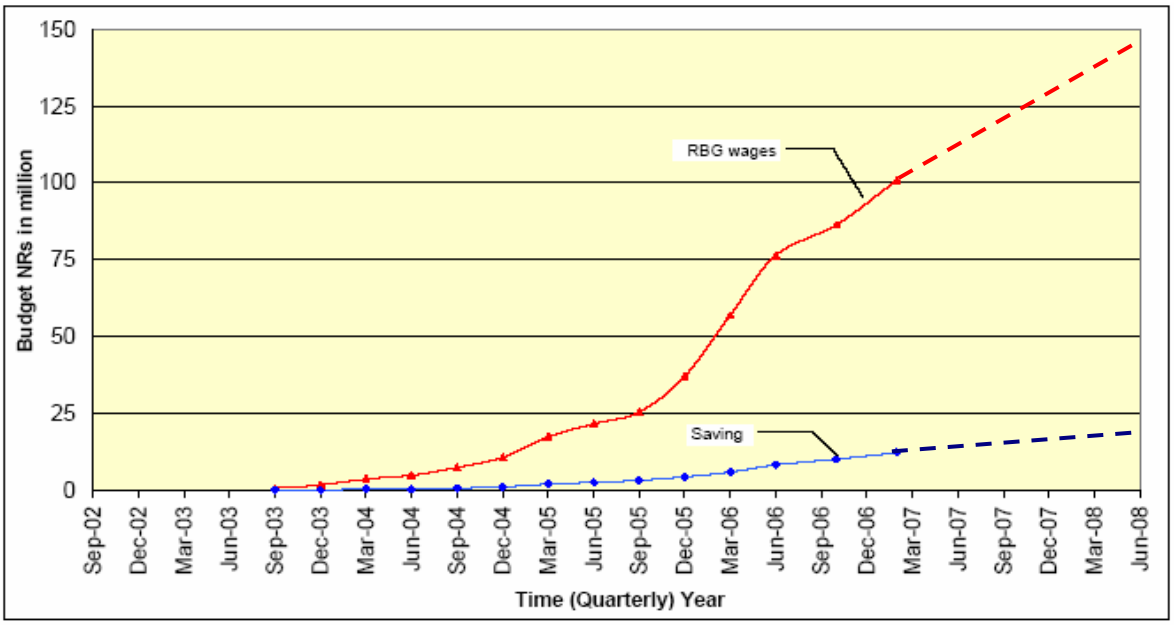


Figure 4 – RBG wages and savings

c) Change in poor peoples' livelihood: Improved literacy and greater awareness of rights and services has added up to a considerable impact. It therefore has a direct impact on the lives of perhaps 24000 families. Many of the poorest beneficiaries have choices for the first time. Collective bargaining of the RBGs has been increased. Public audits and stakeholders' meetings have brought transparency and then trust towards the project. Children especially, girls schooling is increased and also child care centers have been established by the project. Project has ensured that children under 14 are not working.

d) Inclusiveness for women, excluded caste and indigenous people: The project's approach has been possible to ensure that the poorest people are targeted. In this respect, poverty takes precedence over caste and ethnicity, and so excluded and indigenous households do not necessarily gain positive discrimination. Rural household practices sometimes tend to discourage women working outside the home. The project has now achieved the target of 30 percent women participation in the Road Building Groups. The eastern districts are being dominated by the ethnic group, so 60 percent proportion of ethnic and 12 percent of excluded caste representation is found in the group structure.

e) Awareness on health safety and HIV AIDS: The RBG members are provided with training on First Aid. First Aid boxes are found to be very popular in the community. RBG members are provided with safety gears. All of the workers are insured against any kind of physical injuries during construction. All groups have installed latrines on site which is mandatory. Awareness program is launched to the communities against HIV AIDS. Health care & nutrition awareness has been increased. Use of alcohol by RBG members is reduced. RBGs have established emergency fund for their own welfare.

f) Removal of non physical barriers: The project has supported people to address non physical barriers individually, cooperatively or collectively. They found ways of eliminating, reducing or mitigating the effects of coping with these barriers. Group dynamism has increased social cohesion among members reducing discrimination non physical barriers.

## 7. CONCLUSIONS

The project has adopted participatory and flexible approach, which is appropriate to the local conditions and circumstances. The community contracting system approach in rural road construction has proven to be a successful strategy in poverty reduction. Project has shown that labour-based methods are far more effective than the conventional machine-based approach, particularly to the rural road construction in the hill and mountain regions. In addition to providing income generation and increased retention of benefits within the immediate area, labour-based methods are better suited to the staged construction approach and allow works to be undertaken concurrently over all sections along the alignment. This project is a significant first step in areas such as sustainable saving credit activities, income generation and enterprise development. The early results in the project has generated a lot of interest to the communities more then earlier envisaged. There are increased number of demands and requests by communities for micro-projects. The purpose is to provide a new basis on which the future interventions can be designed. It is also necessary that the information and lessons are fed back to the projects and beyond for future use.

It is recommended that impact evaluation be carried out after completion of project for evaluating the effectiveness of the project regarding the poverty alleviation. Department of Roads must ensure cost effective design and engineering approaches of rural roads using local resources. It is necessary for the donor and the executing agency to review its policy from the old fashion use of contractor to community based contracting systems. The social development and environmental concerns of road infrastructure projects should be fully reflected and integrated in project preparation and implementation. Community should be empowered to decide what is most needed in their community, implement the projects and monitor the quality of the results. Public accountability and transparency should be increased in roads projects because access to information reduces corruption, and transparent institutions earn the public's trust.

## REFERENCES


1. Department of Roads, Nepal (1997). Departmental Policy Document. Design Standard for Feeder Roads (Third Revision).
2. Department of Roads, Nepal (2006). Draft Final Report. Sector Wide Road Programme & Priority Investment Plan.
3. Deoja, B. B. (1994). Sustainable approaches to the construction of road and other infrastructure in the Hindkush Himalaya. ICIMOD Occasional Paper No. 24. International Centre for Integrated Mountain Development, Kathmandu, Nepal.
4. DFID, United Kingdom (2000). Nepal Rural Access Programme. Programme Document, PRC Submission (00-38).
5. DFID, United Kingdom and Government of Nepal (2001). Rural Access Programme. Implementation Plan.
6. Howell, J. H. (1999). Roadside Bioengineering Site Handbook. Department of Roads, Kathmandu. Nepal.
7. TRL & ODA, UK (1997). Overseas Road Note 16. Principles of low cost road engineering in mountainous regions.