GOVERNMENT OF NEPAL

MINISTRY OF FEDERAL AFFAIRS AND LOCAL DEVELOPMENT

DEPARTMENT OF LOCAL INFRASTRUCTURE DEVELOPMENT AND AGRICULTURAL ROADS (DOLIDAR)

# ROAD MAINTENANCE GROUPS (RMG)

## GUIDELINES

MARCH, 2016

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## Foreword

Nepal is putting its every effort in leaping towards developing countries. In doing so, the country is able to significantly reduce poverty over the past decade. In order to continue the positive trend of reducing rural poverty and to achieve significant development gains it is necessary to continue the effort to improve connectivity in rural areas.

The local roads play vital role in sustainable and holistic development of rural economy, especially in income-generation by creating employment, livelihood development and positive impact on soci-economic well being through educating local people, road users and Road Maintenance Group (RMG).

With the aim of enhancing the rural connectivity by maintaining District Road Core Network (DRCN), several programme and project are running under Department of Local Infrastructure Development and Agriculture Roads (DoLIDAR), with their own respective norms, guidelines and approaches, resulting confusing among stakeholders and RMG. For maintaining uniformity among all development partners and local road construction investors, DoLIDAR has developed a common Road Maintenance Group (RMG) Guideline 2016, which describes the process of creating and contracting RMG for the maintenance of the DRCN in Nepal.

We hope that this guideline will be instrumental for RMGs for an efficient and effective means for carrying out routine, recurrent and minor specific maintenance of the DRCN, ensuring that the DRCN roads stay open year round reducing road deterioration abruptly. This document serves as a practical unified single approach for utilization of RMG in maintenance of DRCN, both for government or development partners funded local road projects and programmes.

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Date: 2073/2/16

# Preface

As per DoLIDAR's updated records, country has 52,883 km of rural roads. Two third of this length is earthen, and is inaccessible during the rainy season thereby not providing any benefits to the rural communities. Blacktopped and gravelled roads are also poorly maintained, further affecting access. The challenge we have been facing is therefore to make them operational and to ensure that sustained benefits are realized from the asset created.

The rural transport infrastructure in the country has been attracting around 6% of national budget and is increasing over the years significantly. Investment in rural connectivity is made with a broader objective of providing basic access to rural communities. Without having robust maintenance mechanisms, rural transport infrastructures will continue to deteriorate and will cease to provide services. This will have direct impact on rural livelihoods and thereby on rural economy.

There are various rural transport projects implemented by the department with the objective of reducing rural poverty through local road maintenance and connectivity. Rural transport projects are implemented with high priority on rural road maintenance though Road Maintenance groups (RMGs). Since different projects have different modalities of implementation, their varying approach and norms have created confusion among all the stakeholders and implementers like DDCs?DTOs.

DoLIDAR has developed RMG Guidelines 2016, applicable for all the projects under the department, in consultation with stakeholders, development partners and implementers at various levels of implementation. The Guideline consists of the detail process of creating and contracting RMGs for emergency, routine, recurrent, specific, and periodic maintenance of DRCN in the country. This guideline also focuses on generating employment opportunities for the poor in the corridor of impact (COI) through maintenance, and capacity building of the local institutions to maintain rural transport infrastructures in a sustainable way. The RMG Guidelines has provisioned of effective tools and techniques, occupational safety and health (OSH) through OSH gears, accidental insurance, first aids kit, safety equipment like warning flags, traffic cones, self-illuminating jacket, hat/cap, helmet, gloves etc, and decent wage payment in a transparent manner. This arrangement will ensure efficiency and effectiveness in overall maintenance management of local road network (LRN) across the country.

I am sure this RMG Guideline will be useful for all individuals and institutions who are directly or indirectly involved in maintaining the rural transport infrastructures.

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# 1 INTRODUCTION

These guidelines describe the process of creating and contracting Road Maintenance Groups (RMGs) for the maintenance of the District Road Core Network (DRCN) in Nepal. The DRCN is the set of main rural roads providing access to all Village Development Committees (VDCs), and its maintenance is the responsibility of the District Development Committee (DDC). There are currently approximately 22,000 km of DRCN roads, with a further 5,159 km planned to link VDCs that currently lack road access. The RMGs form an efficient and effective means of carrying out routine, recurrent and minor specific maintenance of the DRCN, ensuring that the DRCN roads stay open year round and that road deterioration is halted or slowed down. This document serves as a practical guide to the nationwide implementation of the RMG approach in the DRCN, both under government funding and within rural road projects and programmes.

These guidelines have been prepared on the basis of the Team-based maintenance of rural roads – Conceptual guide prepared by the ILO based on a pilot experience with RMGs in Dhanusha and Ramechhap districts in 2008-2009. The concept was further piloted under the Rural Access Improvement and Development Programme (RAIDP) with ILO in 2012-2013. This version of the guidelines takes into account the recent experiences of other projects and programmes implementing the RMG approach such as Rural Access Project (RAP), Strengthening the National Rural Transport Program (SNRTP), Decentralized Rural Infrastructure and Livelihood Project (DRILP), Local Roads Improvement Programme (LRIP), and Rural Reconstruction and Rehabilitation Sector Development Program (RRRSDP).

RMG members working for cross drain

# 2 RURAL ROAD MAINTENANCE

This chapter briefly explains the process of road deterioration and the role of maintenance as a cost effective means of slowing down and even stopping the deterioration process. This is followed by a description of the maintenance types distinguished in Nepal with their definitions and consideration.

## 2.1 ROAD DETERIORATION

Roads deteriorate over time, mainly as a result of water and traffic. Water can cause deterioration of the road surface, shoulder and the road base, as well as damage to the physical road structures. This happens either through erosion, whereby the road material is washed away and physical structures are undermined, or through stagnation, whereby the road and the base of the physical structures are weakened under the influence of water. Traffic also causes deterioration of the road through the loss of surface material and the deformation of the road surface by vehicle tyres, resulting in the road base becoming exposed and leading to ruts, potholes and corrugations. These two causes of road deterioration tend to aggravate each other, as a road weakened by water is more susceptible to damage by vehicles, whilst road deformation by vehicles can prevent the water from flowing safely away from the road, resulting in increased erosion and water stagnation.

Erosion of the road surface

Gully formation in the road shoulder

Rut formation by vehicles

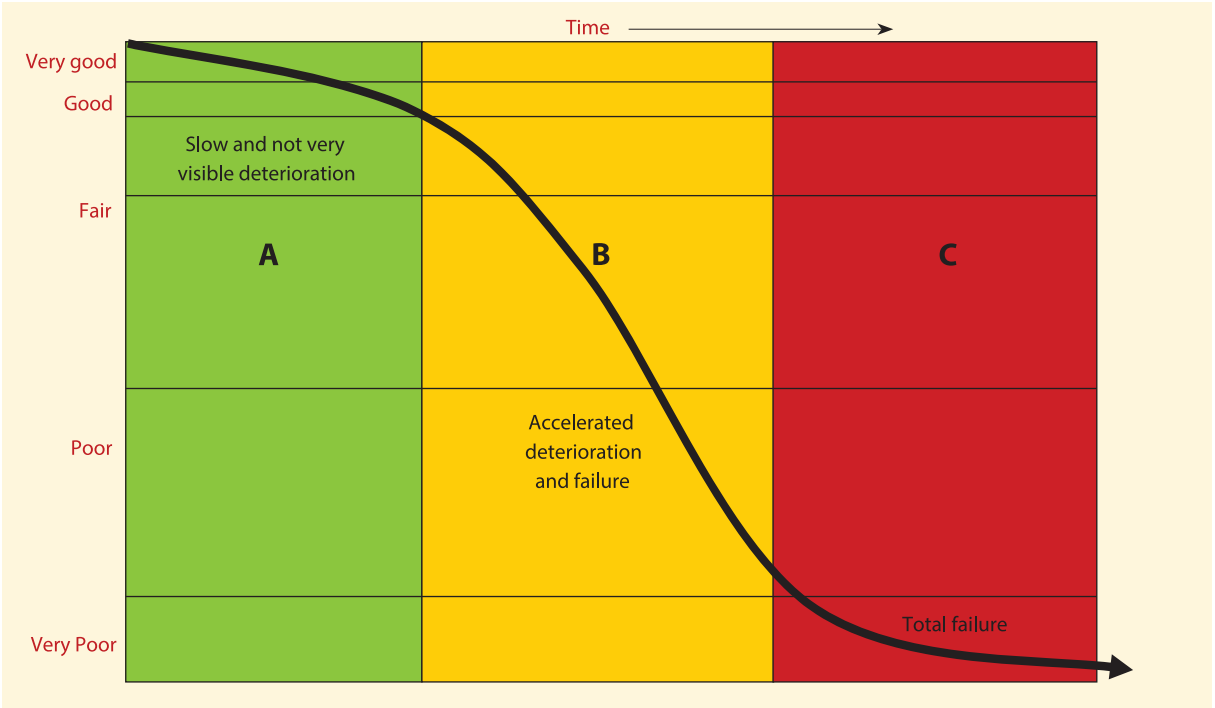
Pothole formation by vehicles

Rut formation in waterlogged areas

Water stagnation in pothole

Road deterioration is generally slow at first and not very visible, taking the form of wear and tear and minor damage to the road surface and the drainage system (this is indicated as phase A in Figure 1). , Proper maintenance may not be carried out during this phase and as a result road starts to deteriorate from a very good to a fair condition. Once the road deteriorates to a fair condition, the deterioration tends to accelerate as the road base and the foundations of the physical road structures start to become affected (phase B in Figure 1). This is especially due to water, which no longer flows safely away from the road as a result of deformation of the road camber and damage to the drainage system. The water causes damage through erosion or remains on the road and weakens it, resulting in greater damage being caused by vehicles. During this phase, the damage to the road quickly spreads, causing longer travel times and more damage to vehicles, until the entire road can be said to be in poor condition. As the road condition becomes very poor, fewer and fewer vehicles use the road until traffic and transport cease altogether when the road is no longer motorable *(phase C in Figure 1).*

**FIGURE 1: Road deterioration**



## 2.2 ROAD MAINTENANCE

The condition of the road can be improved by carrying out corrective maintenance activities. Repairs are made to the road surface and shoulder, the drainage system and the other physical road structures. The improved road condition generally results in lower travel times and travel costs, and a decrease in the speed of road deterioration as the deterioration process starts from scratch. The more deteriorated the road is, the more intensive and costly the repairs will be. For instance, corrective maintenance activities when the road is still in good or fair condition (arrow 1 in Figure 2) may entail patching potholes, grading of the road surface and minor repairs to the drainage system and other road structures, whereas corrective maintenance activities carried out once the road is already in poor condition (arrow 2 in Figure 2) are likely to entail complete reshaping and resurfacing of large stretches of road and possible replacement of drainage and other structures. The distance from the black line indicating the road condition, to the desired good or very good condition of the road is therefore indicative of the level of corrective maintenance activities required, and of the cost of such repairs. Corrective maintenance activities need to be carried out repeatedly. Although maintenance carried out when the road is still in good to fair condition will have to be repeated more frequently, this results in lower overall maintenance costs and better overall road conditions than waiting till the road has deteriorated to a poor condition.

Apart from corrective maintenance activities once the road has already deteriorated, it is possible to carry out preventive maintenance activities aimed at slowing down the deterioration of the road. Such preventive maintenance activities are often carried out on a continuous basis and consist primarily of clearing activities aimed at preventing damage to the road, but also include minor repairs to the road surface and road structures in order to prevent more serious damage from occurring. As a result of such preventive maintenance activities, the deterioration of the road is slowed down considerably, as can be seen in the following graph *(arrow 3 in*

**FIGURE 2: Corrective maintenance**

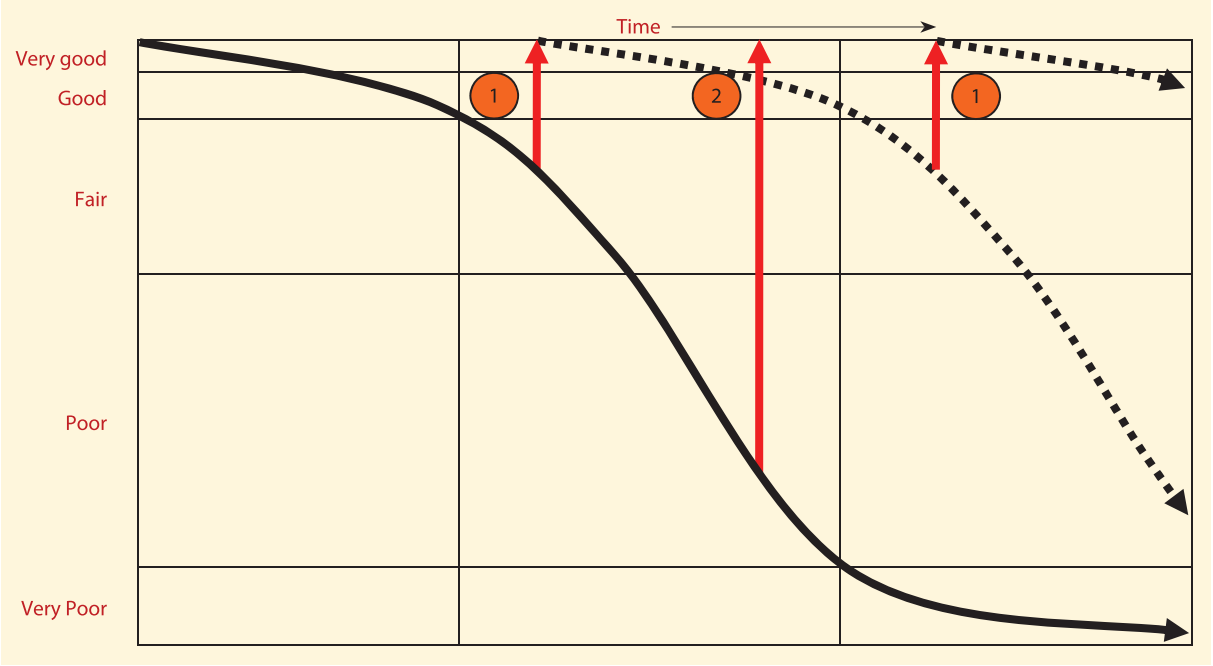
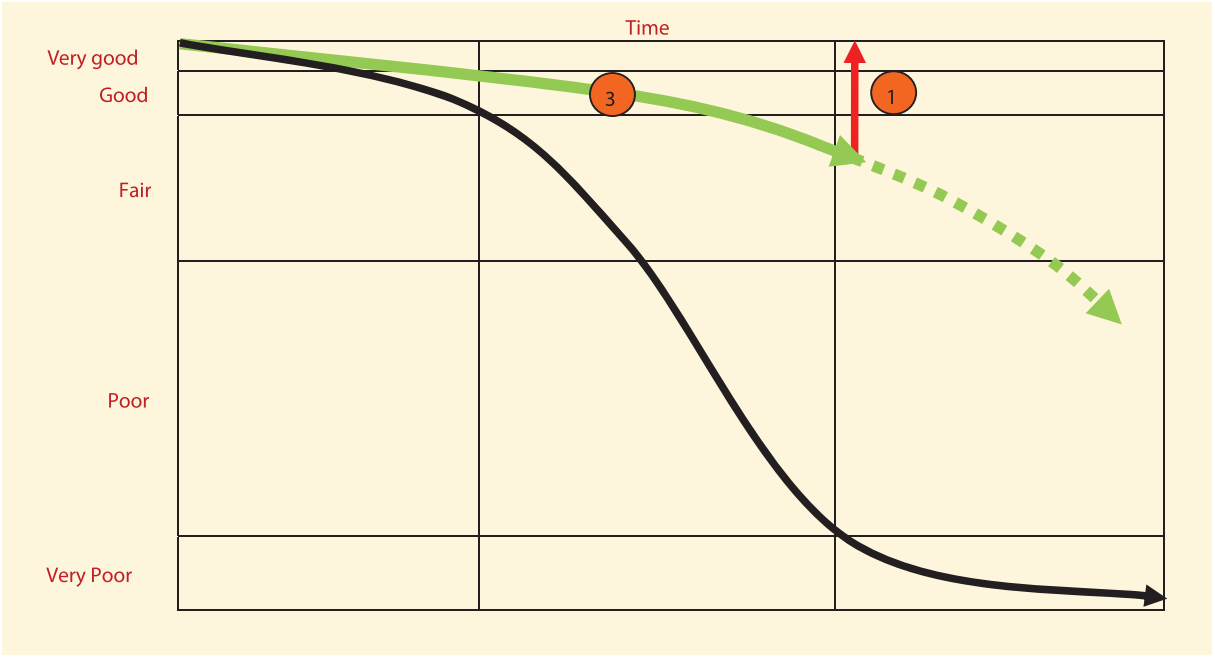


*Figure 3)*. Consequently, corrective maintenance activities are required less frequently *(arrow 1 in Figure 3)* leading to reduced overall maintenance costs. In addition, the road remains in better condition, resulting in lower travel times and road user costs. The additional costs of such continuous preventive maintenance activities are more than compensated by the cost savings as a result of the decreased need for costly corrective maintenance activities.

There is a tendency to focus maintenance activities on those roads that are in poor condition, thus bringing them back to a better condition through periodical corrective maintenance,

**FIGURE 3: Preventive maintenance**




which reduces travel costs and time. It is often believed that this strategy will have the highest impact on the condition of the rural road network, as those roads with major problems are being addressed. However, this point of view does not take into account that road conditions change over time, and that the higher investments required for roads in poor condition result in a shorter road length being attended. As a result of this limited maintenance coverage, the roads in good to fair condition remain unattended and deteriorate more rapidly. From an economic point of view, the best option is to prioritise investments in the maintenance of roads that are in good to fair condition, applying preventive maintenance activities and slowing down deterioration. This tends to involve less costly activities that allow a greater length of roads to be maintained, resulting in a larger length of roads being in good to fair condition at the end of the intervention. Any funds remaining after investing in the preservation of the roads in good to fair condition can be spent on repairing roads in poor condition, which can subsequently enter into the preventive maintenance system. This is the main distinction between reconstruction and maintenance, that whilst for reconstruction it makes sense to focus on roads in poor to very poor condition, for maintenance the focus should lie on the roads that have not yet deteriorated and are still in maintainable condition.

## 2.3 MAINTENANCE TYPES IN NEPAL

Several types of maintenance are distinguished in Nepal. A definition of the different maintenance types is given below.

**Routine maintenance** refers to small maintenance works to be carried out in all seasons on all roads on a regular basis, comprising simple categories of maintenance works. Routine maintenance involves the cleaning and clearing of different road elements to ensure that they work properly and that damage to the road is avoided.

**Recurrent maintenance** refers to small maintenance works not falling under routine maintenance that are carried out a few times a year in all roads to repair minor damage resulting from traffic and rainfall. Recurrent maintenance involves minor repairs to the road surface and other road elements to bring them back to their proper condition.

**Specific maintenance** refers to all the spot improvements and repairs that do not occur every year or in every road, and which are very specific in nature and location. This involves localized repairs and improvements to the road to ensure the proper functioning of the different road elements and reduce the need for routine and recurrent maintenance.

**Periodic maintenance** refers to maintenance works that are to be carried out in intervals of years, that are of large-scale, and that are aimed at preserving the structural integrity of the road. This mainly involves activities aimed at rejuvenating the road surface and carrying out repairs over long stretches of road. The pavement comprises earthen, gravel and blacktopped surfaces. In earthen road periodic maintenance includes grading and reshaping of pavement with some localised repairs (retaining structures, pipe culvert and slab culvert, dry stone pitching, repair of drain, creation of earthen drain, traffic furniture) within interval of 2 to 3 years. Similarly, in gravel surface periodic maintenance includes re-gravelling with some localised repairs (retaining structures, pipe culvert and slab culvert, dry stone pitching, creation of drain, repair of drain, and traffic furniture within interval of 3 years. In case of black topped road, periodic maintenance includes surface dressing, ottaseal, patch repair with sand seal, asphalt overlays within interval of 5 to 7 years.

**Emergency maintenance** refers to works that are to be carried out due to unexpected and sudden blockage of roads due to natural disasters that stops vehicular movement. The aim of emergency maintenance is to quickly reopen the road, reinstate vehicular movement and protect the road from further damage. Reinstating the damaged road to its original condition after completion of emergency maintenance works is not included under emergency maintenance!

*New construction, improvement, upgrading, and rehabilitation are not considered to be maintenance activities, and as such are not treated in these guidelines.*

# 3 ROAD MAINTENANCE GROUPS

This chapter aims to introduce road maintenance groups (RMGs) as a simple and practical means of implementing preventive maintenance aimed at slowing down and even halting road deterioration. The concept of RMGs is explained, together with the maintenance activities they are responsible for, and the tools and equipment, occupational, safety and health they require.

## 3.1 ROAD MAINTENANCE GROUPS (RMG)

One very important characteristic of preventive maintenance is that it is continuous in nature. Damage cannot be prevented unless there is somebody there to prevent it, and as it is not known exactly when the damage will occur, a more or less continued presence is required. Although certain countries have opted for a system where at particular times of the year maintenance workers are contracted to carry out preventive maintenance of the road, this still allows road deterioration to roam freely in the intermediate periods. Many countries, including Nepal, have therefore opted for a more continuous presence of maintenance workers, generally in smaller numbers than in the case of repetitive interventions. For the strategic road network in Nepal a system of preventive maintenance based on length workers already exists, whereby each individual worker is allocated a particular length of road that he or she has to maintain.

For the rural road network a variation of the length worker system is applied whereby the workers engaged on a particular road are grouped together and are responsible as a group for the maintenance of the entire road. This has the advantage that the administrative burden is decreased enormously, with contracting, supervision, planning and inspection taking place for the road as a whole rather than separately for each section. Also, the road maintenance groups are able to reallocate their members according to need, thus allowing them to allocate additional time to the more problematic road sections. An added benefit is that working in groups increases the motivation of the workers, as they have someone to interact to during the work and the amount of work seems more achievable if done together with others.

These benefits are especially important in rural roads, which are generally with an earthen or gravel surface and tend to have very located problematic areas which require additional attention. Also, the local authorities responsible for these roads tend to lack sufficient human and financial resources to cope with the requirements of a length worker system. The system of road maintenance groups has been very successful in the countries where it has been applied, and in Latin America has become the norm for preventive maintenance, being applied in national, secondary and rural roads .[1]

[1] Here the RMGs are generally referred to as road maintenance microenterprises.

## 3.2 MAINTENANCE ACTIVITIES OF THE RMGS

The RMGs are responsible for routine and recurrent maintenance, as well as emergency maintenance. In determining the activities of the RMGs, the criteria has not so much been assignation of any particular maintenance type, but rather the assignation of particular activities within the competence of the RMGs. The RMG maintenance activities have been determined based on the maintenance activities falling under each maintenance type, selecting those activities that can be carried out by unskilled workers (with limited training) using basic hand tools. Activities related to routine maintenance of bridges and causeways have also been included to extend the benefits to these structures that are essential in providing all-season access in Nepal.

The main objective of the RMGs is to allow the trouble-free use of the road and to reduce damage to the road by ensuring the proper working of the road protection measures, particularly the drainage system and support walls. This basically consists of the routine clearing and cleaning of the road surface, shoulder and physical road structures.

**ROUTINE MAINTENANCE ACTIVITIES (DAMAGE PREVENTION)**

**Activities in paved + unpaved roads**

- Clearing of small landslides and other material on the road (<5m$^3$)
- Clearing of drains
- Clearing of culverts
- Clearing under bridges
- Cutting and clearing of vegetation
- Cleaning of traffic signs and road furniture
- Cleaning of weep holes in retaining walls
- Maintenance of bioengineering features

**Activities in bridges and causeways**

- Clearing surface of drifts/causeways
- Clearing bridge deck and railing (including footpaths)
- Removal of vegetation from all parts of bridge and causeway structures
- Clearing spouts and weep holes in bridges
- Cleaning of bearings and expansion joints in bridges

**Note:** Volumes in excess of those indicated above are not included under the responsibility of the RMGs and need to be reported to the DDC or DTO.

Clearing landslides

Clearing drainage ditches

Clearing and cutting vegetation

Clearing & maintaining culverts

Apart from these purely routine maintenance activities aimed at ensuring the proper functioning of the road and its physical structures, the RMGs are also responsible for recurrent maintenance aimed at repairing minor damage in order to prevent the damage from becoming more serious. The RMGs are therefore also responsible for basic repairs to the road surface, shoulder and physical structures.

**RECURRENT MAINTENANCE ACTIVITIES (DAMAGE REPAIR)**

**Activities in unpaved roads (gravel + earthen)**
- Repairs of rills/gullies in the road surface
- Repairs of ruts in the road surface
- Repairs of potholes in the road surface
- Repairs of corrugation of the road surface in short length.
- Repairs of backfills over culverts
- Creation of diagonal water bars across the road surface to avoid water flowing over the road

**Activities in paved roads** (these will require specific training, materials and equipment)
- Repairs of potholes in the road pavement
- Repairs of edge break in the road pavement
- Sealing of cracks in the road pavement

**Activities in paved + unpaved roads**
- Repairs of cuts in the road shoulder
- Repairs of ruts in the road shoulder
- Repairs of potholes in the road shoulder
- Repairs of erosion in the drains
- Repairs of minor damage to retaining walls (e.g. replacing stones, fixing gabion wire)
- Repairs of minor damage to structures
- Repairs of erosion damage around structures
- Repairs and painting of traffic signs and road furniture

**Activities in bridges**
- Painting and repair of bridge railing and safety barriers
- Lubrication of bearings
- Repair of expansion joints in short length
- Sealing and pavement repairs in approach road and bridge deck
- Minor protection works to avoid damage to crossing structures

In Nepal, many roads in the District Road Core Network lack suitable drainage systems and physical support structures. The problem faced by the RMGs is therefore not so much the deterioration of the road protection measures, but the general lack of such measures. Without a proper drainage system to guide the water safely away from the road or physical support structures to protect slopes and shoulders from collapse, the required repairs quickly build up and become impossible for the RMGs to resolve. Although such medium to major repairs could of course be carried out on a periodical basis as part of other maintenance arrangements, the prevention of such damage in the first place will always be more cost-effective.

*Note:* The activities of RMGs in Nepal are responsible mainly Routine maintenance but extended to include minor specific maintenance aimed at creating basic road protection structures to prevent damage to the road. These structures are very simple in nature (e.g. earthen side drains, dry stone walls), allowing them to be created by unskilled labour using hand tools and local materials. Once created, they enter into the general system of clearing and minor repairs. Please note that larger specific maintenance does not fall under the responsibilities of the RMGs.

Repairing ruts and potholes

Repairing the road shoulder

Repairing retaining walls

Repairing the backfill over culverts

**SPECIFIC MAINTENANCE IN DRCN ROADS (PROTECTION MEASURES)**

**Activities in unpaved roads**

- Dry stone pitching of short section (<300 m2 per kilometre of road)
- Gravelling of short section (<300 m2 per kilometre of road)

**Activities in paved roads**

- Patch work of potholes of short section (<300 m2 per kilometre of road)

**Activities in paved + unpaved roads**

- Creation or repairs to dry-stone retaining wall (<5 m3 per wall)
- Creation or repairs to gabion retaining wall (<5 m3 per wall),
- Slope stabilization and bio-engineering
- Removal of banks on shoulders
- Shoulder improvement
- Creation of earthen side drains
- Repairs to the existing drainage system (e.g. erosion)
- Creation of stone-paved drifts where water flows over road (<200 m2 per kilometre of road)
- Removal of hanging cliff/rocks (<10 m3 per kilometre of road)
- Maintaining side slopes by small back cutting.
- Signage and road furniture

**Note:** Listed items above are the item considered under specific maintenance and need to select the work item for RMGs which are only unskilled in nature with workable volume .Volumes in excess of those indicated above are not included under the responsibility of the RMGs and need to be reported to the DDC or DTO.

The maintenance activities of the RMGs encompass several of the maintenance types distinguished in Nepal. All routine maintenance activities are included, as are those recurrent and specific maintenance activities that do not require skilled labour, equipment or significant materials and that are not too large in scope. Emergency maintenance is only included where the required intervention is small in nature. Periodic maintenance activities are not included, however, due to the scope of the work required and the need for skilled labour and equipment.

Creation of side drains

Creation of stone paved water crossings

Creation of dry stone retaining walls

Protection of slopes by planting vegetation

Emergency maintenance to allow traffic to pass critically problematic section of the road

The different maintenance activities to be carried out by the RMGs can also be grouped according to the different road elements that they correspond to, resulting in the following list of RMG maintenance activities. A more detailed description of these maintenance activities can be found in *Annex 1*.

| ROAD ELEMENT | RMG MAINTENANCE ACTIVITIES |
|---|---|
| **Road** | • Clearing landslides, materials and obstacles |
| **Earthen or gravel surface** | • Repairing ruts, rills, gullies, potholes, corrugations<br>• Creating water bars<br>• Creating dry stone pitching, stone-paved drifts<br>• Graveling |

| ROAD ELEMENT | RMG MAINTENANCE ACTIVITIES |
|---|---|
| **Blacktop surface** | • Repairing potholes and edge breaks<br>• Repairing ravelling and stripping<br>• Sealing cracks |
| **Road shoulder** | • Repairing ruts, rills, gullies, potholes<br>• Repairing cuts and improving shoulder<br>• Removing banks |
| **Drains** | • Clearing drains<br>• Repairing erosion and other damage<br>• Creating earthen drains |
| **Culverts** | • Clearing culverts<br>• Repairing backfill over culverts |
| **Bridges and causeways** | • Clearing drifts and causeways<br>• Clearing under bridges, bridge deck, bridge spouts, weep holes and vegetation<br>• Cleaning expansion joints and lubricating bridge bearings<br>• Cleaning, painting and repairing bridge railing and safety barriers<br>• Repairing erosion damage and placing minor protection works |
| **Vegetation** | • Cutting and clearing vegetation |
| **Traffic signs and road furniture** | • Cleaning signs and road furniture<br>• Repairing and painting signs and road furniture |
| **Retaining walls and structures** | • Cleaning weep holes<br>• Creating retaining walls<br>• Repairing minor damage<br>• Repairing erosion damage |
| **Slopes** | • Maintaining bioengineering features<br>• Planting bioengineering features<br>• Trimming side slopes |

## 3.3 TOOLS, SAFETY EQUIPMENT AND MATERIALS

This section looks briefly at the tools, safety equipment and materials required by the RMGs to carry out the road maintenance activities described above.

### 3.3.1 TOOLS

As mentioned earlier, one of the criteria used in determining the maintenance activities to be carried out by the RMGs was that these could be carried out using basic hand tools. The tools used by the RMGs are listed below, whereby certain tools are particular to the maintenance of roads in the Hills or Terai. Annex 2 contains a more detailed description of these tools, specifying the numbers of tools required. The set of tools may be adjusted to the requirements of a specific road or district. The RMGs should receive a small allowance for the maintenance of the tools (new handles, sharpening of edges, etc.) or these costs should be reimbursed.

| TOOLS | | |
|---|---|---|
| • Wheelbarrow / Doko | • Hoe / Faruwa / Kodalo | • Pickaxe |
| • Shovel | • Long handled shovel (for culvert cleaning) | • Rake |
| • Curved knife / Sickle | • Machete / Khukuri | • Hand rammer |
| • Large crowbar | • Hammer | • Chisel |
| • Pulling rope | • Foot pump | • Plastic tubs |
| • Watering can | | |


Some of the tools used by the RMGs

### 3.3.2 SAFETY EQUIPMENT

Apart from these hand tools, the RMGs also require basic safety equipment to avoid accidents and injuries as well as promoting Decent Job for Workers. These safety items are listed below, whilst Annex 2 provides more detail. The safety vests mentioned below have the double function of making the workers visible to road users, as well as clearly identifying them as part of the RMG.

**SAFETY EQUIPMENT**

- Warning flags or Traffic cones
- Safety vest(self-illuminating Jacket)
- Hat / Cap
- Helmet
- Gloves
- Safety goggles
- Mask
- Boots / Shoes
- Raincoat
- First-aid kit










Some of the safety equipment used by the RMGs

The tools and safety equipment should be purchased by the DDC/DTO or projects and provided to the RMGs at the beginning of the work, avoiding delays related to payment transfers and ensuring proper quality tools and equipment are procured. It is important to provide good quality tools in sufficient number, as this greatly influences the productivity of the RMGs. The costs of tools and equipment only form a minor part of the overall maintenance costs. The set OSH gears need to be replaced once useless duly certified by Engineers. The medicines in the First Aid boxes will be replaced and added by DTO periodically or provide a lump sum amount for replacement to RMG and evaluate at the time of monthly inspection. Typical contents of First Aid Kit are Triangular Bandage, First Aid Bandage, Instant cold pack, first aid burn cream, Fingertip bandage, wound dressing pack, Eye Wash fluid, antiseptic fluid/ Tincture Iodine, soap, thermometer.

### 3.3.3 MATERIALS

Specific maintenance activities, construction materials are required (bitumen, asphalt, aggregate, gravel, gabion crates and wire, etc.). In certain cases these can be obtained locally, but in other cases these will have to be provided to the RMGs (this generally involves the transport of material from suitable locations to the road in question). Bitumen and asphalt may need to be heated before they are applied (unless cold mixes are used). It is recommended that these materials provided directly by the DDC/DTO or road project on a case by case basis, to avoid problems in the estimation of the required materials at the beginning of the maintenance contract. It is important to stress, however, that the timely provision of such materials determines the effectiveness of the RMGs in carrying out the required repairs to the road surface, shoulders and physical structures.

# FORMATION OF THE ROAD MAINTENANCE GROUPS

4

Road maintenance groups can start carrying out the maintenance activities mentioned in the previous chapter after the formation of groups. Group based maintenance is found effective, efficient and self-motivated with good internal control mechanism. This entails determining the required number of RMG members, selecting the RMG members, and recording the RMG with the DDC/DTO. This chapter deals with these three aspects of RMG formation.

## 4.1 SIZE OF THE RMG

Before starting with the selection of the RMG members, the size of the RMG should be determined. This is defined by the road length, the required work input (number of person-days required per kilometre of road per year) and the approximate number of person-days to be worked by an RMG member each year. The input level or number of person-days required per kilometre per year depends on the characteristics of the road, especially the road condition, topography, road surface type, traffic levels and existence of road protection structures. Roads in worse condition (with a maintenance backlog), located in steeper areas, with less durable road surfaces, with higher traffic levels or with fewer road protection measures in place, require a higher input level with more person-days per kilometre per year (there is a higher workload per kilometre). The input level may vary for different sections of the road if these have very differing characteristics. The input of RMGs per km per year are derived from the experiences from ILO maintenance pilots , RAIDP, RAP and SNRTP projects and programmes to keep the road pliable throughout the year including emergency maintenance as per requirement.

As an initial estimation it is recommended to use an input level of approximately 65 person-days per kilometre per year for relatively good or fair condition black top road, they need at least this level of input to slow down the deterioration process. The input level may be increased to approximately 156 person-days per kilometre per year for earthen or gravel roads in poor condition with a large maintenance backlog, with high traffic levels, with high risk of erosion and/or insufficient road protection measures. Unfortunately, available budgets may prohibit the general use of such high input levels for extended periods of time. Where roads are in very poor condition and are not in a maintainable standard, it is more effective to rehabilitate these roads before placing them under maintenance by RMGs. The varying level of input for different surface types and conditions of roads are given in the table below.

| ROAD TYPE | APPROXIMATE INPUT LEVEL |
|---|---|
| **(A) Blacktop Road** | |
| Road in good/fair condition in dry season i.e. road is passable by normal car at min road design speed (20 & 40 Km/hr for Hill & Terai respectively) | 65 person-days per kilometer per year |

| ROAD TYPE | APPROXIMATE INPUT LEVEL |
|---|---|
| Road in poor condition in dry season i.e. road is passable by normal car in below road design speed (less than 20 & 40 km/hr for Hills and Terai respectively) | 104 person-days per kilometre per year |
| **(B) Earthen/Gravel Road** | |
| **Road in good/fair condition in dry season i.e. road is passable by normal car at min road design speed (20 & 40 Km/hr. for Hill & Terai respectively)** | 80 person-days per kilometer per year |
| Road in poor condition in dry season, road is only passable by 4x4 Bus, Truck or tractor or normal car in below road design speed. (less than 20 & 40 Km/hr for Hill & Terai respectively) | 104 person-days per kilometer per year |
| Road in poor condition i.e. in dry season, road is only passable by 4x4 Bus, Truck or tractor and required heavy maintenance | 156 person-days per kilometer per year |

**Note**: However DTO , programme/project has to ensure that at least 50% and 80% of total allocated budget per km annually spent for RMGs in Black top and gravel/earthen surface respectively irrespective of defined condition above.

Actual input levels may vary slightly depending on road condition, specific needs and funding sources. These input levels allow the RMGs to carry out routine cleaning and clearing works, recurrent minor repairs and minor specific maintenance aimed at creating basic road protection measures. When the road conditions improves, the maintenance backlog is reduced and more and more road protection measures are created by the RMGs or by other actors. The input level may be gradually reduced.

The number of people required for the RMG will then depend on the length of the road concerned and the number of person-days that each RMG member will work in a year. Based on 6 days a week, there are approximately 312 workdays a year (excluding Saturdays, or any one day in a week). The RMGs may work half time or full time based as long as they achieve the allocated task in a month in accordance with monthly work plan. The half time and part time employment depends upon the programme guideline or project operation manual and input required for maintenance.

Based on the total length of the road (section) to be maintained, the size of the RMG can be determined. The number of workers for the entire road length should of course be rounded up or down to result in a whole number. As a result, the RMG members in different roads will not always cover the same average length of road or work the same amount of days. What will be same is the number of person-days spent per kilometre of road (as long as the input levels are the same).

It is recommended that every road have its own RMG, thus facilitating the administration of the road maintenance works. However, where the road is very long (more than 10-15 km) and the RMG members would have to travel over long distances to carry out the maintenance, it is advisable to split the road into sections and create separate RMGs. Maximum travel times of RMG members should not exceed 1.5 hours. Distance to the road section will depend on topography and possible short cuts. Alternatively, where the road is very short and the RMG would be very small (less than 4 members), it is advisable to group a number of roads together and have an RMG cover different roads within the immediate vicinity of each other.

Based on the resulting road length of each contract, the DTO will estimate the number of full-time or half-time workers (deployed for the performance based contract) required to form the

RMG that will maintain the road (sections). Ideally, RMGs should have 4-7 members, although exceptions are possible in specific cases.

## 4.2 SELECTION OF RMG MEMBERS

RMG members are selected from the communities situated along the road (sections) to be maintained, or from those communities nearest to the road. For the selection of the RMG members approved selection criteria are used to ensure the objective choice of the most suitable candidates. Suitability in this sense refers to both the ability of the candidates to perform the job well (technical criteria) as well as to social objectives of providing jobs and income to vulnerable groups in society (social criteria). Before the start of the selection process, the DDC body will conduct a meeting and approve the selection criteria and selection modality. It is recommended to use the following criteria, although these may be amended by the DTO/DDC to attain particular objectives.

**TECHNICAL CRITERIA**

- The selected maintenance workers must be above 18 years of age
- The selected maintenance workers must be physically and mentally able to work on road maintenance
- The selected maintenance workers must live near the road to be maintained (reducing travel time)

**SOCIAL CRITERIA**

- The selected maintenance workers must be unemployed or employed less than 25% of their time
- The priority must be given to poorest and marginalised people of the VDC
- Preference must be given to female candidates and where possible, all 100 % selected maintenance workers should be women but not less than 33% in any case.[2]
- At least 40% of the maintenance workers must be from Disadvantaged Groups (Dalits, Janajati, other excluded and deprived groups.[3])

Mainly two different methods are applied for the selection process (i) the Interview method or (ii) through a mass meeting. In case of both methods, information to be circulated will include the selection criteria, information on payments and working hours, and the means of applying for the positions (where and by when to submit an application). An example of a RMG Formation Notice required for an interview method is provided in Annex 3. Interested candidates will be required to fill in an RMG Application Form, providing information related to the selection criteria listed above. A sample RMG Application Form is provided in Annex 4. Once the application date has passed and the applications have been received, a selection is made using the selection criteria mentioned above.

While applying mass meeting method the respective VDC will call and organise a mass gathering making sure that it has representation of at least 33% households of nominated wards adjacent to both sides of the road. All candidates should comply with the selection criteria. In doing, an attempt should be made to select as many women as possible, ensuring that at least 33% of the RMG members are women, preferably more than 50%. VDC secretary will play the role of unbiased facilitator who explains to the mass about the purpose of the

[2] 33% is equivalent to 1 out of 2 workers, 1 out of 3 workers, 1 out of 4 workers, 2 out of 5 workers, 2 out of 6 workers, 2 out of 7 workers, 3 out of 8 workers, 3 out of 9 workers, 3 out of 10 workers.

[3] 40% is equivalent to 1 out of 2 workers, 1 out of 3 workers, 2 out of 4 workers, 2 out of 5 workers, 2 out of 6 workers, 3 out of 7 workers, 3 out of 8 workers, 4 out of 9 workers, 4 out of 10 workers.

meeting, role and responsibilities of RMG members and criteria and process of selection. Selection of the RMG members from interested candidates is to be carried out by consensus through a participatory method.

lf RMG member need to replace, husband or Wife or nearest family member will be given priority. DTO can also select the workers from previously approved list for replacement of RMG members or may re start the process as per guideline depending on local situation.

The required number of maintenance workers is selected from the highest ranked candidates. It is recommended to subsequently confirm the interest of the selected candidates in order to ensure they are all aware of what is required of them and what they will receive in return (remuneration, insurance, etc.). Any candidates deciding they do not wish to participate can then still be easily replaced. After the selection has been completed and the interest of the selected candidates has been confirmed, the VDC will send a list of the recommended candidates together with the minutes of the selection meeting to the DDC/DTO. Once the list of selected candidates has been approved by the DDC/DTO, the list is posted on the notice board of the VDC and the successful candidates are informed.

## 4.3 RECORD OF THE RMG

Once the selection of maintenance workers has been finalised, the RMG is recorded/registered with the DDC/DTO. This record also defines the name by which the RMG will be known. The RMG should also elect the representatives of the group. This generally includes a Chairperson and a Treasurer. The election of women into these functions should be promoted, and at least one of the representatives should be female.

Individual Bank accounts are opened for payments of wages to each individual member of the RMG. The DDC/DTO will be responsible for making payments to each individual RMG member based on their monthly performance and certification by technical team.

Alternatively a bank account for a RMG can be opened for payment of remuneration. The bank account will be on the name of at least two RMG member duly nominated by RMG members. This will prevent mismanagement of payments and secure timely payments to individual RMG members.

# 5 TRAINING OF THE RMG

After recording the RMG and opening the bank account(s), the group is ready to be contracted. Before they start work, however, they require training. This training should encompass the technical issues involved in the maintenance contract (how, when and where to implement the different maintenance activities), as well as the managerial aspects of the maintenance contract (how are the payments made, what documents need to be presented, etc.).

This training can easily be carried out in two days, one day covering the theoretical introduction to maintenance and group management, and one day on the practical implementation of the different maintenance activities. It is recommended to carry out the practical training on the road the RMG will be responsible for. The theoretical training requires a suitable classroom-type location and may be given to more than one RMG at once, although it is recommended to hold it as close as possible to the road(s) concerned.

## 5.1 THEORETICAL TRAINING

The theoretical training is aimed at providing the maintenance workers with an understanding of the causes of road deterioration, in order to ensure that they fully understand how to prevent these and the importance of the maintenance activities for which they are responsible. A better understanding of why a certain activity needs to be done leads to a better execution of that activity.

First of all, an introduction is given to the different road elements that make up a road. Attention is subsequently given to the effect of water and traffic in the deterioration of various road elements, and the resulting effects on the lifespan and use of the road. This is done using pictures depicting the different types of road deterioration, explaining the causes in each picture. This is followed by an explanation of the different maintenance activities and their role in slowing down or halting the road deterioration. For this purpose, pictures are again used to show how the different activities are carried out, as well as to show the required end result (pictures showing the situation before and after). Finally, the different tools are introduced, explaining their use. This part of the training will be complemented by the field training during which the participants are required to practise carrying out the different activities.

The second part of the theoretical training is aimed at the management of the RMG. First of all, the benefits of working as a group are explained to the participants, both the benefits for themselves as well as those for the DDC. The organisation of the different workers within the group is also discussed for the different maintenance activities, explaining how some activities are best executed by having different group members execute particular tasks (e.g. one person loosening the soil with a pickaxe, the other excavating the soil into a wheelbarrow, and the third removing the excavated soil to another location), whilst other activities can be carried out individually and group members can work side by side (e.g. cutting vegetation), or even carry out different complementary activities (e.g. excavating side drains and using the excavated material to fill ruts

Classroom training of RMG members

and potholes). The proper organisation of the workers and their tools is an important factor in increasing the productivity of the RMG, and sufficient attention should be paid to this.

The final part of the theoretical training deals with the supervision, planning, inspection and payments. This part is aimed at explaining how often the supervisor will visit the RMGs and what he or she will do, how the work plans are determined and agreed upon, when the inspections takes place and what is inspected, and how the payments are made based on these inspections. Important issues to be included in this part of the training are the work plan and its format, and the performance standards and how these feed into the inspection reports. Another important issue is the performance-based nature of the payments, whereby the exact payment amount depends on the inspection results rather than the number of days worked. These issues are explained in the next chapter.

## 5.2 PRACTICAL TRAINING

The second day of training is aimed at providing the maintenance workers with practical experience regarding the execution of the different maintenance activities. This training does not necessarily have to be carried out the day after the theoretical training. The date can be set to best suit the RMG and trainer(s). The training is carried out on the road for which the RMG is responsible. It is possible to include different RMGs in the same training, although it is preferable to carry out different training sessions for each RMG and road. An important aspect of this training is that sufficient types and quantities of tools are available to allow the different RMG members to practice in their use. This training could therefore also be planned to coincide with the handing over of the tools and safety equipment to the RMG.

For the practical training it is important that a suitable location be found in the road concerned, where most if not all the different maintenance activities can be demonstrated and practised. This location should be identified beforehand and the RMG members should be asked to gather at this location in the morning. During the training, the different maintenance activities relevant to the road concerned are explained and demonstrated in detail, identifying the different tasks concerned. It is important that all RMG members practise in the implementation of the different activities. Attention should also be given to the use of the proper tools and the proper use of these tools.

Practical training of RMG members

## 5.3 ORGANISATION OF THE TRAINING

As mentioned before, the theoretical training requires a suitable location for the training, which should be identified and reserved beforehand. Also, the RMG members need to travel to this training location, for which it is recommended to provide them with a reasonably small transport allowance. In the case of the practical training, the RMG members are expected to live close by to the road concerned and transport allowances are not required. Food and snacks should be provided for both training days, thus avoiding that much time is lost with the participants leaving for their homes or nearby shops during the meal break. Lastly, if the training is carried out before the start of the maintenance contract, the RMG members do not yet receive any remuneration for their time, and it should be considered whether they are paid for the time they spend in the training. This also depends on when the training is carried out, and whether it is likely that their participation in the training will cause them to miss other income generating opportunities. It is important to avoid a situation where RMG members do not participate in the training because of the costs involved in doing so.

The two training sessions should not be seen as the only capacity building for the maintenance workers. The RMGs need continued support for at least the first 6 months, and it is recommendable to do this for the first year in order to cover all the different seasons. During this period the RMGs should be visited regularly to ensure they are implementing the different maintenance activities according to plan and in the right manner. These visits need to be more frequent with new RMGs or when new activities are planned, but can become less frequent once the RMGs are working properly.

The training of the RMGs can be carried out by the DTO/DDC Engineers or road project staff, or otherwise by trainers contracted specifically for this purpose. The regular visits to the RMGs can be carried out by the same people that did the training, or otherwise technicians from the DDC/DTO can be made responsible. In some countries graduate students have been used to provide regular supervision to the RMGs as part of their curriculum, resulting in a low cost alternative and providing the students with valuable practical experience. The important issue is that the personnel responsible have the time and transport facilities at hand to ensure timely and frequent visits.

# 6 CONTRACTING ARRANGEMENTS

Once the RMG has been recorded with the DDC/DTO, they can sign the maintenance contract, and if it has already received its training, it will be ready to start work. The payments for the maintenance activities will be made according to performance, based on the resulting conditions of the different road elements. However, because many rural roads will be in poor condition at the start of the contract, and because the RMGs cannot fix all the defects at once, the performance-based system will need to be introduced in a phased manner. For this purpose, a work plan is prepared on a monthly basis to determine for which road elements and on which sections of the road the performance-based system will be applied. As road conditions improve, an increasing portion of the road elements and road length will be included in the work plan until the entire road is covered, at which time the work plan will no longer be necessary. Subsequent to carrying out the work plan, the work has to be inspected to ensure that the condition of the road elements and the road section included in the plan are appropriate. This inspection forms the basis of the payments to be made to the RMGs. This chapter will go into these different aspects of contracting RMGs, starting by explaining the concept of performance-based contracting.

## 6.1 PERFORMANCE-BASED CONTRACTING

The RMGs will be contracted on a performance basis, which means that the RMGs are paid based on the compliance with a set of performance standards and not on the amount of work carried out or the amount of time spent on that work. This has advantages for both the RMG and the DDC/DTO. For the DDC/DTO it results in a lower administrative burden, as it is not necessary to control the daily attendance and productivity of the maintenance workers, or to measure the exact volume of work completed. A simple inspection of the end result of the maintenance work is sufficient to determine if this is according to the agreement. For the RMG it has the advantage that it has greater freedom to decide what part of the day to work and whether or not to work extra hard and finish early, thus allowing them to arrange their time to best suit their other responsibilities.

In Nepal, the majority of rural roads are in fair to poor condition with large quantities of backlog. It is recommended to have RMG payment on ae performance basis by measuring the output in each month with respect to the corresponding work plan.

Performance-based contracting involves a set of performance standards that determine the required condition of the different road elements by defining the allowable defects (or defining the defects that are not allowed). The RMGs need to comply with these performance standards by ensuring that the defects to the different road elements do not exceed the allowances, fixing the defects where these exceed the allowances. A list of recommended performance standards for the different road elements is given below. Note that the performance standards relate to the different road elements and not to the individual maintenance activities. Different

maintenance activities may be required to fix the defects where these exceed the allowances defined in the performance standards. Due to the simple nature of the performance standards, their compliance can easily be monitored by the RMGs prior to inspection.

**PERFORMANCE STANDARDS**

- **Road** - There are no small landslides (less than 5 cubic metres), materials or other obstacles on the road surface, road shoulder, or side drains. In the case of large landslides (more than 5 cubic metres), these have been reported to the DDC/DTO. Vehicles are able to pass and water does not flow over the road.
- **Earthen or gravel surface** - There are no remarkable potholes (>60 x15 cm), no ruts, rills or gullies (> 15 cm deep), and no corrugation (> 7 cm deep) which disturb the traffic movement. Repairs to gravel surfaces have been made using suitable gravel material. In areas subject to longitudinal erosion, diagonal water bars have been created at regular intervals to guide the water away from the road. Where water crosses the road, stone-paved drifts have been created. In case of stone pitching, the stones are well anchored in the ground, do not stick out, and there are no missing stones. Water does not flow over or remain on the road.
- **Blacktop surface** - There are no remarkable potholes (>30 x 10 cm) which disturb the regular movement of traffic. The potholes can be repaired with locally available material. There is no significant edge break that reduces the width of the pavement. There are not any wide unsealed cracks existing in the maintained road Wider than 0.5 cm.
- **Road shoulder** - There are no remarkable potholes (> 30x10 cm) and no ruts or rills (> 10 cm deep). There are no uninterrupted banks on the road shoulder for more than 10 metres. The road shoulder is not more than 5 centimetres below the road pavement. Water does not remain on the road shoulder.
- **Drains** - Less than one-quarter of the cross section at any point in the side drain is blocked. The drain is at least 15 centimetres wide and 10 centimetres below the road surface. There are no sharp curves in the drain and the drain has a proper outlet. Water can flow freely through the side drain, and there is no erosion of the drains. Water does not flow over the road surface or shoulder.
- **Culverts** - Less than one-quarter of the culvert height at any point in the culvert is blocked, the inlet and outlet are clear, water can flow freely through the culvert, and there is no erosion at the inlet or outlet. The backfill over the culverts is at least one-quarter of the culvert diameter.
- **Causeways and Bridges** - Drifts and causeways are free of sedimentation and are able to drain freely. Less than one-tenth of the cross section of the bridge is blocked, and the areas 5 metres on either side of the bridge are clear of obstructions. Water can flow freely under the bridge. The bridge deck, spouts and weep holes are clean. There is no vegetation growing in the crossing structures. Bridge railings are clean and covered in paint. Bridge bearings are clean and lubricated. Bridge expansion joints are clear. There is no damage to the approach road and bridge deck and cracks are sealed. Minor erosion has been repaired and protection measures are in place. Large damage to or erosion of the bridge structure has been reported to DDC/DTO.
- **Vegetation** - Vegetation within 1 metre of the road is less than 30 centimetres high (except trees), vegetation protruding over the road is at least 2.50 metres above the road surface, and the flow of water away from the road is not restricted. Vegetation on slopes is not removed, only cut short.
- **Traffic signs and road furniture** - All traffic signs and road furniture are clean and legible (painted where necessary). Sign posts are straight and well anchored in the ground. Any damaged or missing signs have been reported to the DDC/DTO.
- **Retaining walls and structures** - The retaining walls and structures are in good condition and the area behind them is compacted. There are no loose stones or other damage to the retaining walls, and weep holes are clear. There is no damage by erosion undermining the retaining walls and structures. Large damage to retaining walls and structures has been reported to the DDC/DTO.
- **Slopes** - The slopes and road shoulders prone to erosion have been planted with vegetative material. The plants are not dried out and well anchored to the soil. There are no loose stones or other material on the slopes and road side slope should be in stable condition.

**Note 1:** These performance standards are for internal control mechanism, not fully comply in monsoon season and just basis for monitoring.
**Note 2:** Above performance standard can be considered as basis for monitoring as defined in note 1 only on last worked or maintained section of the road by RMGs not before than 1 month.

## 6.2 MAINTENANCE WORK PLAN

The performance standards need to be complied with for the entire road length under contract in performance-based maintenance systems. In Nepal, where most of the roads are not in

very good condition and proper drainage and road protection structures are often lacking, the RMGs cannot be made responsible for bringing the entire road up to good condition at the start of their contract. In some cases, the road will be rehabilitated or improved through other means, allowing the RMGs to start with a road in good condition, but where this is not the case, a phased introduction of the performance standards is required. Certain road elements and certain road sections need to be prioritised, which requires the preparation of a work plan. This work plan defines the road elements and road sections where the performance standards will be applied – any road elements or road sections not included in the work plan will not need to comply with the performance standards and will be excluded from the inspection.

As the conditions of the road improve as a result of the work carried out by the RMGs or through complementary maintenance activities carried out through other means, the RMGs can be made responsible for an increasing portion of the road length and road elements. As such, the work plan will partly consist of activities aimed at preventing damage to road sections and road elements repaired in previous months or through other means, and partly consist of activities aimed at repairing remaining damage in new road sections and road elements. Eventually, the entire road length under contract will be in compliance with the performance standards and the RMG will simply be responsible for ensuring that the road condition is maintained and that the performance standards continue to be complied with. At this stage a work plan is no longer required and the planning will become an internal matter of the RMGs, with the inspection covering the entire road length and all road elements. Thus, the work plan is only required for roads that do not comply with the performance standards at the start of the contract. Once sufficient repairs have been carried out and the road complies with (almost) all performance standards, the work plan is no longer needed and the performance standards will simply be applied to the entire road section and all road elements.

As mentioned above, the work plan defines for which road elements maintenance activities need to be undertaken and identifies the road sections in which these maintenance activities need to be carried out. As such it determines the quantity of work to be carried out. The work plans should be prepared on a monthly basis by the DDC/DTO in coordination with the RMGs. The RMG system assumes that the group members have to provide an average of 65 to 156 person-days per year per kilometre of road, working either full-time or half-time. These person-days do not necessarily need to be distributed evenly over the year, and generally more days are spent during the rainy season when the road is subject to damage by rainfall runoff, with fewer days spent during the dry season.

Taking into account the number of person-days available in a specific month for the RMG concerned, the work plan identifies a set of tasks to be carried out that can be completed within the available number of person-days. The supervisor (DDC/DTO or Consultant) is hereby guided by task-rates quoted in section 6.2.1, which define the volume of work that may be completed in one person-day. These task rates may be adjusted based on the observed ease with which the RMG achieves the workload (i.e. whether more or less than the expected person-days are required). The supervisor will set the work load to include only part of the

allocated road sections or to include only certain road elements or maintenance activities. The resulting condition of the included road elements and road sections should comply with the performance standards, allowing the RMGs to become familiar with the approach of performance standards. The ambition is to eventually transition to a full performance-based approach where the whole road is kept in compliance with the performance standards.

To facilitate the planning, a simple work plan format should be used in which the maintenance activities and road sections to be covered can be easily indicated. An example work plan template is given in Annex 5. The work plan lists the different RMG maintenance activities for each of the road elements as discussed in Chapter 3, and covers the total road length divided into 500 metre sections. The general location of the road sections to be worked on are indicated in the work plan, whereas the actual location will be indicated in the field (for instance a certain 500m section is identified for the cleaning of culverts, whereas the actual culverts will be located in particular locations within this 500 m section). It is important to include the location of identifying points in the work plan to assist both the DDC/DTO and the RMG members to locate themselves on the road and on the work plan. This may be further facilitated by painting chainage indications on rocks, trees and electricity poles along the road. Based on the monthly work plans, the RMGs will need to plan their work on a weekly and daily basis. The RMGs will likely require assistance at the start of their contract to train them in organising their monthly workload.

### 6.2.1 TASK RATES

The amount of work an RMG is able to carry out in a month will depends on the number of available person-days and the amount of work that can be carried out per person-day (the task rate). In defining the maintenance activities and road sections to be included in the work plan, account should be taken of the task rates for the different activities planned, in order that the total estimated requirement of person-days is more or less equal to the available number of person-days from the RMG for the month concerned. As mentioned before, the number of person-days does not have to be the same each month, and may vary according to need, as long as the total number of person-days per year is equal to the input level (80, 100 or 150 person-days per kilometre per year). The table below gives some initial indications of task rates for the different activities grouped by road element. These task rates are based on experiences from the ILO maintenance pilots and from the subsequent replication in the RAIDP, RAP and SNRTP projects and programmes. To assist in the preparation of the work plan and the calculation of the workload each month and the related requirement in terms of person-days, a work volume calculation sheet is included in Annex 6.

This should be filled in every month as a tool to calculate the expected requirement in terms of person-days for the month concerned. This sheet is only meant as an aid in preparing the work plan, and should not be given to the RMG. The RMG only receives a copy of the approved work plan.

| ROAD ELEMENT | RMG MAINTENANCE ACTIVITY | AMOUNT/PERSON-DAY |
|---|---|---|
| Road | • Clearing landslides, materials and obstacles | 3 - 4 $m^3$ |
| Earthen or gravel surface | • Repairing ruts, rills, gullies, potholes, corrugations<br>• Creating water bars<br>• Creating dry stone pitching, stone-paved drifts<br>• Graveling, preparing subgrade and gravel laying | 10 - 15 $m^2$<br>20 - 40 m<br>2 - 3 $m^2$<br>6 -8 $m^2$ |
| Paved surface | • Repairing potholes or fixing edge break<br>• Sealing cracks | 5 - 10 $m^2$<br>100-150 m |
| Road shoulder | • Repairing ruts, rills, gullies, potholes<br>• Repairing cuts and improving shoulder<br>• Removing banks | 10 - 15 $m^2$<br>2 - 3 $m^3$<br>3 - 4 $m^3$ |
| Drains | • Clearing drains<br>• Repairing erosion and other damage<br>• Creating earthen drains | 100 - 200 m<br>2 - 4 $m^3$<br>20 - 40 m |
| Culverts | • Clearing culverts<br>• Repairing backfill over culverts | 1 - 3 units<br>2 - 3 $m^3$ |
| Bridges and causeways | • Clearing drifts and causeways<br>• Clearing under bridges, bridge deck, bridge spouts, weep holes and vegetation<br>• Cleaning expansion joints and lubricating bridge bearings<br>• Cleaning, painting and repairing bridge railing and safety barriers<br>• Repairing erosion damage and placing minor protection works | 3 - 4 $m^3$<br>½ - 1 bridges<br>1 - 2 bridges<br>¼ - ½ bridge<br>2 - 4 $m^3$ |
| Vegetation | • Cutting and clearing vegetation | 300-400 $m^2$ |
| Traffic signs and road furniture | • Cleaning signs and road furniture<br>• Repairing and painting signs and road furniture | 10 units<br>5 units |
| Retaining walls and structures | • Cleaning weep holes<br>• Creating retaining walls<br>• Repairing minor damage<br>• Repairing erosion damage | 50 units<br>1 - 1½ $m^3$<br>1 - 1½ $m^3$<br>2 - 4 $m^3$ |
| Slopes | • Maintaining bioengineering features<br>• Planting bioengineering features<br>• Removing hanging rocks<br>• Small back cutting on side slopes | 50-100 $m^2$<br>15-25 $m^2$<br>2 - 3 $m^2$1.4 - 2 $m^3$ |

It is important to realise that these task rates are average values and are not absolutes. The actual productivity achieved depend on the soil type, climatic conditions, characteristics of the road elements, transport distances for the required materials, etc. The incorporation of all these variables requires a great effort and will not necessarily make the resulting work plan more accurate. It is therefore recommended to use the task rates mentioned above as initial estimates and to evaluate the performance of the RMGs compared to these rates. The task rates can subsequently be adjusted up or down. The work volume calculation sheet allows for adjustment of the task rates.

It is important that the work plan is treated with certain flexibility, however, as inaccurate estimates of the amount of work or the task rates may have important effects on the number of person-days required for the completion of the work. In addition, it may be necessary to adapt the work plan during the month to unforeseen needs, such as the clearing of landslides. The principal issue is that the required workdays for the completion of the work are approximately

equal to the available workdays from the RMGs for a specific month, whereby flexibility from both the RMGs and the DDC/DTO is required to ensure fairness in the consideration of the work plan at the time of inspection.

### 6.2.2 TIMING OF ACTIVITIES

In preparing the monthly work plan, account should be taken of the timing of activities throughout the year. Whereas in the rainy season the attention should be focused on the proper working of the drainage system, guiding water away from the road, removing landslides and avoiding erosion, in the dry season this is of less importance and attention can be given to other activities. Depending on the season, different maintenance activities should therefore be included in the work plan.

In the period before the rainy season, the maintenance activities focus on the preparation of the drainage system, slopes and road shoulder to allow the safe guidance of water away from the road and avoid erosion. This is continued during the rainy season, during which additional (temporary) measures are taken to avoid erosion and water stagnation and keep the road open, removing landslides where these occur. After the rainy season, the moisture content of the road is very suitable for affecting repairs to the road surface and shoulder, and the focus of attention will be on these activities, as well as clearing remaining landslides and vegetation that form an obstacle for traffic. During the dry period, the work on the road surface and shoulder will continue, and will be complemented by repairs to the physical road structures. The proposed priority of the different maintenance activities for the different times of the year is given in Annex 7.

## 6.3 INSPECTION OF THE MAINTENANCE WORK/SUPERVISION AND MONITORING

During the inspection, supervision and monitoring, both the scope and the quality of work are evaluated. The scope of work is defined in the work plan in terms of the road sections, road elements and maintenance activities to be covered, whereas the required quality of the work is defined by means of the performance standards.

The supervision and monitoring of the work will be carried out by assigned technicians or by the DDC/DTO Engineers of the projects and programme on weekly basis to supervise the quality and performance of the RMGs as per agreed work plan. The non-compliance work performed by the RMGs need to address in the instruction book and area of improvement shall be noted on the instruction book. Besides, supervision team need to ensure the OSH gears to RMGs as well as appropriate construction tools in the site. The supervision team need to check the RMG daily attendance sheet and require certification of attendance in comparison to work perform on weekly basis. The Engineers and sub engineers need to ensure the supply of required construction materials for the repair pot holes, ruts and rills which are not available in sites.

The inspection is carried out on a monthly basis and coincides with the work plan period. At the same time that the inspection is carried out, the new work plan can also be discussed and agreed upon. The inspection should be carried out by the DDC/DTO Engineer or a trained technician. In case of road projects, project staff may be involved in the inspections on behalf of the DTO and DDC. All inspections should be carried out together with representatives of the RMG.

During the inspection the road sections indicated in the work plan are inspected with respect to the road elements and maintenance activities indicated in the work plan, and the resulting road conditions are compared to the performance standards and allowable defects. The rest of the road sections and road elements that are not included in the work plan do not need to be inspected. However, a general inspection of the road is required to make sure that there are no major problems (especially blockages), and where these exist, that they are being resolved by the RMG or have been reported to the DDC.

For the inspection use is made of a simple Inspection Form (an Inspection Form template is given in Annex 8), in which the (non-)compliance with the work plan and performance standards is indicated for each road element. Road elements that are not included in the work plan and have not been carried out are checked as being "not applicable". For the road elements that do not comply in quantity or quality with respectively the work plan and the performance standards, the nature of the non-compliance should be described.

Based on the degree of non-compliance, it may be decided to apply a deduction to the monthly payment. It is recommended that a warning be given the first time, and that upon repetition a deduction may be applied. The deduction is applied to the payment for the entire RMG and should be based on the amount of work not completed satisfactorily, applying the task rates discussed earlier to determine the number of person-days payment to be deducted. Using the daily wage rate, this can be converted into a deduction amount.

The application of deductions can be unpleasant, but may be necessary to ensure that the RMGs work according to standard. Care should be taken, however, that the lack of compliance is not a result of overzealous work plans instead of underachievement by the RMGs. In the case a deduction is applied, the amount is indicated in the Inspection Form, together with the final amount to be paid to the RMG. The results of the inspection as well as any deductions to be applied should be discussed with the RMG members, and the RMG chairperson and maintenance inspector are both required to sign the inspection report. Whenever practicable it is recommended that a photographic record before and after each month's maintenance work is recorded. This will help in verification of outputs.

The number of person-days spent by the RMG during the month concerned will also be recorded in the Inspection Form. This will have no effect on the payment, and only serves for monitoring purposes to check whether the payments made in the different roads are appropriate, and to develop more appropriate payment categories based on road characteristics. For this purpose, the RMGs will be required to keep an Attendance Sheet of the number of person-days spent each month (daily record of the number of RMG members that worked). A template for an Attendance Sheet is provided in Annex 9. The RMG Chairperson should use the Attendance

Sheet to record every day how many hours each RMG member worked.

During the inspection, the total number of person-days spent by the RMG members in the month concerned is calculated and copied into the Inspection Form. Possible deductions together with the approved monthly payment are in turn copied from the Inspection Form to the Attendance Sheet. Based on the approved payment and the number of days worked by the different RMG members, the distribution of the approved monthly payment amongst the RMG members is calculated and entered into the Attendance Sheet. Where the monthly payment is made into a joint bank account for the RMG as a whole, the Attendance Sheet with the calculated payment distribution is left with the RMG as the basis for distributing the monthly payment amongst the RMG members. Where individual payments are made, a copy of the Attendance Sheet is made and taken to the DDC/DTO as the basis for making the individual payments. This ensures transparency regarding the approved monthly payment and its distribution amongst the different RMG members.

## 6.4 PAYMENTS

The payments to be made to the RMGs consist of wage payments for the maintenance workers and in some cases also allowances. Accident insurance is also provided for the RMG members by the DDC/DTO or road project.

### 6.4.1 MONTHLY WAGE PAYMENTS

For the wage payment, it is recommended to use the updated district rate for unskilled labour multiplied by the input level (number of person-days per kilometre per year), multiplied by the road length. This annual wage payment is then divided into fixed equal monthly wage payments. These monthly wage payments should be paid out at the end of each month after inspection of the work, and any deductions should be applied only to these monthly wage payments.

The timeliness of these wage payments is very important, as these are used by the group members to cover the costs of living for themselves and their families. Delays in receiving these payments may force them to leave the RMGs in search of other income opportunities to allow them to purchase their daily needs. Due to the administrative processes generally required for these payments, which can only be started once the payment amount has been approved in the inspection report, delays in transferring these payments on a monthly basis are difficult to avoid, and it is therefore necessary to ensure that the payment procedures are simplified and streamlined as much as possible. District Development Committee and District Technical Offices will insure the RMG monthly payment within 1 st Week of next month after completion of the work of previous month. Example Payment of RMG for month of Mangshir should not later than 1 st week of Poush. District Development Committee will manage fund from their own District Development Fund for the period district has not received authorisation from Centre.

Wage payments may be made on an individual basis. This requires each individual RMG member to have a bank account. The DDC/DTO or road project are then responsible for

determining the distribution of the monthly wage payment (after possible deductions) amongst the different RMG members based on the number of days worked by each member as recorded in the Attendance Sheet.

In the case of payments to group bank accounts for the RMG as a whole, the distribution of the wage payments amongst the individual members is the responsibility of the RMG members and should be based on the Attendance Sheet. The proper distribution of wage payments based on the Attendance Sheet should be monitored regularly by the DDC/DTO or road project staff to avoid misuse of funds by certain RMG members. The RMGs may also be required to present their accounts for public audit.

### 6.4.2 ALLOWANCES

In some cases, it may be decided to also provide the RMGs with monthly allowances. One of the possible allowances to be included is the tool maintenance allowance. Considering that the tools and safety equipment will be provided by the DDC, this allowance need only cover the maintenance of the tools and safety equipment. This can be used for sharpening of tools, replacement of wheelbarrow spare parts and replacement of handle. This allowance is set according to established norms. It is recommended to have 1% of wage payments.

A second possble allowance is the transport allowance, which serves to cover the costs of transport of the Chairperson and Treasurer or other members of the RMG to the DDC office and the local bank. This allowance is especially important in cases where the costs of travelling to the DDC office are very high. The level of the transport allowance will vary per RMG, depending on the distance to be travelled.

A third possible allowance is an admin allowance, which serves to cover miscellaneous costs such as the costs of notebooks, pens and bags and mobile phone costs. This admin allowance is generally a small amount per month (a few hundred rupees).

The allowances are generally paid in fixed monthly instalments together with the wage payments (the allowances are, however, not susceptible to deductions). The allowances are paid, irrespective of whether they are used or not (although RMGs can be required to ensure tools are properly maintained, are replaced, etc.).

These allowances ensure that RMGs are not made responsible for costs related to their work, but they do introduce an additional administrative burden and cost. Alternatively, it may be decided not to apply such allowances, and to instead provide direct support (e.g. in the sharpening of tools) or to reimburse the RMGs on a case-by-case basis. The RAP project has applied monthly allowances in its contracts with RMGs, while the SNRTP program has provided direct support or reimbursed costs on a case-by-case basis. The important issue is to avoid that the performance of the RMG is negatively affected by issues related to tool maintenance, transport or administration of the RMGs. The costs involved are relatively small compared to the wages, and should therefore not have a significant effect on the RMG productivity. Allowances will be applied as per defined in project specific operational manual.

### 6.4.3 ACCIDENT INSURANCE

To ensure that any work-related injuries incurred by the RMG members can be suitably treated by a doctor or nurse, RMG members as well as associated technicians should be covered by a job accident insurance. RMG members can make use of this insurance to cover any medical bills they have that are related to work injuries. This will require an insurance company which allows changes of maintenance workers (RMG members may change and allow replacement as defined in project specific operational manual) and pays out promptly. Alternatively, an insurance fund may be created at DDC level to cover the costs related to such work accidents.

## 6.5 MAINTENANCE CONTRACT

The maintenance contract stipulates the roles and responsibilities of both the RMGs and the DDC/DTO, as well as any other partners (for instance, the Local Road Users' Committee, road project). It defines the activities the RMGs will be responsible for, the performance standards they have to comply with, the remuneration they will receive in return, how the planning and inspections will be carried out, and the tools and safety equipment the RMGs will receive. This document should contain sufficient detail to ensure that all roles and responsibilities are well defined, whilst at the same time remaining simple enough for the RMG members to easily understand.

It is important to remember that the contract is a legal agreement, and that the content should be understood and agreed upon by both parties. Such a legal document provides the DDC/DTO with security regarding the work to be undertaken by the RMG and the payments to be made to it, but at the same time means that any changes to the work and payments may require an addendum to the contract which has to be agreed to by both parties.

Given the importance of the contract document, some time and effort should be given to the preparation of a contract template suitable to the district and type of roads in question, and possibly certain changes need to be made for roads with particular characteristics or requirements. A sample contract template is provided in Annex 10.

Upon signing the road maintenance contract, each RMG member will receive an Identity Card to identify them as a road maintenance worker. Experience has shown that this also helps them to receive discounts in the use of public transport to and from their work site but each RMG member has to submit their identity card at the time of receiving final payment. To clarify that this job is temporary in nature and RMG are not considered government employees in future, a note should be written on identity card. Note may be such as 'Identity card is issued based on contract signed for a fixed duration of time. lt does not give any entitlement to extension or renewal of the contract beyond the stipulated duration. Under this contract, the RMG is considered to be a service provider. RMG members are not considered government employees, nor do they qualify for any entitlements related to government employees.

# 7 COSTS AND FINANCING OF THE RMGS

An important aspect of maintenance is the cost, as well as how this cost should be covered from available funding. This chapter will briefly go into the cost of RMGs, followed by an identification of possible funding sources available to DDC's for financing the maintenance of rural roads.

## 7.1 COSTS OF RMGS

The costs of RMGs include the wage payments, but also other costs such as the costs of tools and equipment to be provided to the RMGs, the monthly allowances (or the direct costs of tool maintenance, sign boards, etc.), the costs of materials for road repairs and the costs of accident insurance.

The main costs are the wage payments to the RMGs. As mentioned, these are based on the district wage rate and the number of person-days per kilometre, multiplied by the road length and divided into equal monthly payments. The wage costs depend on the wage rate for the particular district concerned and the input level for the particular road concerned. These costs tend to make up 80%-90% of the total costs of the RMGs.

The cost of the tools and safety equipment, the different allowances and the accident insurance can be estimated to form approximately 10%-20% of the wage costs. The costs of tools and safety equipment will be higher during the first year, but these may be used for several years (although some will need to be replaced). It must be repeated, however, that the tools and equipment form only a fraction of the total cost, and as such cost savings on tools and equipment as a result of purchasing smaller amounts, lower quality, or not replacing worn tools, will have little effect on the overall costs, whilst having a significant negative impact on the productivity of the RMGs and thus on the effectiveness of the investment.

Additional costs may consist of the provision of materials for road repairs. These costs mainly involve transport costs and will vary according to the type of materials and transport distances.

*Example: The annual wage payment is for a specific RMG is NPR 565,000 per year. The DDC/DTO spends NPR 55,000 on the purchase of tools, safety equipment and accident insurance. An additional NPR 50,000 is spent by the DDC/DTO on purchasing and transporting materials to the roadside. The total cost for the first year of operation of the RMG comes to NPR 670,000, equivalent to NPR 59,300 per kilometre per year.*

## 7.2 ROAD MAINTENANCE FUND

The crucial issue in road maintenance is securing the funding necessary to cover the maintenance costs. The District Development committee in coordination with District Technical office allocate the budget to cover all the maintenance intervention envisaged and routine maintenance in all DRCN as per DTMP and Multi Year Road Maintenance Plan (MYRMP) or on the basis of past years annual road maintenance plan (ARMP) as District Road Maintenance fund.

The required maintenance budget can be obtained from the following sources which are as follows;

- Block grants to DDCs - This is the most important funding source DDCs received from MoFALD. The allocate maintenance fund is expected to reflect in Annual Road Maintenance plan (ARMP).
- SWAp funding – Funding under the Sector-Wide Approach involves conditional grants for the rural road sector. The received fund must need to allocate in Annual Road maintenance Plan (ARMP) to cover the large scope of maintenance in all DRCN.
- Roads Board Nepal (RBN) - An annual amount is transferred to each district based on the length and surface types of the rural road network, and is aimed primarily at road maintenance, especially routine and recurrent maintenance. This fund is necessarily allocate in Annual road maintenance plan to decrease the funding gap in maintenance.
- DDC Internal Revenue: Some part of fund must need to allocate in maintenance to fulfil the funding the gap in Annual Road Maintenance Plan (ARMP).
- LGCDP Grant: Allocation from LGCDP top up grant in Annual road maintenance plan to cover the all requirement.
- Road projects and programmes - These internationally financed road projects are increasingly giving attention to road maintenance. Several road projects and programmes currently support the contracting of RMGs. As such, these projects will form a significant source of funding for RMGs in Nepal in the medium term.

It exist large number of non-maintainable condition road and DDC prime responsibility is to conserve the road and all DRCN pliable throughout the year round. Hence, the identified sources are sustainable funding source that allows full coverage of the entire DRCN by RMGs as well as regular specific, periodic maintenance (after few years) and emergency maintenance every years. .However, every year district faces shortage of maintenance fund after closing of account at the end of fiscal year until they receive new budget for next year from central budget, during this period District Development Committee has to manage fund to Road Maintenance Group (RMG) from district's own internal resources.

# ANNEXES

## ANNEX 1: RMG MAINTENANCE ACTIVITIES

| ROAD ELEMENT | RMG MAINTENANCE ACTIVITIES |
|---|---|
| Road | • Clearing landslides and obstacles - Clearing of obstacles, materials and landslides up to 5m3 from the road surface, shoulder and the drainage system in order to allow normal vehicle transit and proper drainage of runoff water. |
| Earthen or gravel surface | • Repairing ruts, rills, gullies, potholes, corrugations - Filling ruts and potholes formed by traffic as well as rills and gullies formed by water erosion with compacted earth, stones and gravel (where applicable), and restoring the uniform road surface in order to allow normal vehicle transit and avoid damage to the road base. This includes basic reshaping of the road to ensure a proper camber to drain water away from the road surface.<br>• Creating water bars - Creation of simple diagonal ditches to catch any water flowing over the road and guide this to the downhill side of the road. These measures are often temporary in nature, and created only for the rainy period.<br>• Creating dry stone pitching - Placement of paving stones on a short section of the road surface to provide better grip and carrying capacity in muddy areas or steep slopes.<br>• Creating stone-paved drifts - Creation of small drifts (dips in the road) to safely guide water from one side of the road to the other, with stone paving to protect against damage by traffic and water.<br>• Graveling - Placement of a gravel layer on a short section of road to provide better grip and carrying capacity where the road surface material is slippery or muddy. |
| Blacktop surface | • Repairing potholes and edge breaks - Removing loose material and creating vertical edges, filling and compacting the underlying base course up to the bottom of the pavement to provide proper support for the pavement, placing and compacting bitumen mixes or asphalt in layers to repair the pavement, filling and compacting the road shoulder to the level of the pavement to avoid new edge breaks.<br>• Sealing cracks - Removing any loose material from the cracks, filling the cracks with bitumen or sealant to avoid water penetrating into the pavement and weakening it. |
| Road shoulder | • Repairing ruts, rills, gullies, potholes - Filling ruts and potholes formed by traffic and rills and gullies formed by water erosion with compacted earth, stone and gravel (where applicable) in order to restore a uniform surface. Filling up the road shoulder to the level of the pavement (where applicable).<br>• Repairing cuts and improving shoulders - Filling and compacting cuts or depressions in the road shoulders to ensure that the road is not undermined. This is often complemented by the creation of basic dry stone retaining walls or the planting of vegetation to avoid damage from happening again.<br>• Removing banks - Removal of raised road shoulders where these restrict runoff water from flowing away from the road. |
| Drains | • Clearing drains - Clearing the side drains and other drainage ditches of sediment and other material that may obstruct the free flow of water, in order to ensure proper drainage and the protection of the road.<br>• Repairing erosion and other damage - Affecting minor repairs to the drainage system to ensure their continued and proper working, including the placement of scour checks and the filling of areas undermined by erosion.<br>• Creating earthen drains – Excavating basic side drains in areas prone to erosion or the stemming of water, in order to guide water safely away from the road surface and avoid undermining of the road. |
| Culverts | • Clearing culverts - Clearing rocks, branches, sediment and other debris that may obstruct the free flow of water in the culverts, in order to ensure proper drainage and the protection of the road.<br>• Repairing backfill over culverts - Placement of additional soil and/or gravel on the road surface over existing culvert pipes where these are close to the surface, in order to avoid them becoming damaged by traffic. |

| ROAD ELEMENT | RMG MAINTENANCE ACTIVITIES |
|---|---|
| Bridges and causeways | • Clearing drifts and causeways - Removing material on the drift or causeway as well as any blockages at the inlet or outlet to ensure water can flow freely over the causeway and away from the road.<br>• Clearing bridges - Clearing rocks, branches, sediment and other material that may obstruct the free flow of water below the bridges, in order to ensure proper drainage and the protection of the road and bridge. Clearing the bridge deck to allow traffic to pass unobstructed. Cleaning spouts and weep holes to allow water to drain away freely. Removing vegetation from the bridge structure to avoid it causing damage.<br>• Maintaining expansion joints and bearings - Cleaning any material from expansion joints to ensure these can work properly. Cleaning bearings and lubricating them to ensure they do not become jammed.<br>• Maintaining railings and safety barriers - Cleaning, painting and repairing bridge railings and safety barriers to ensure these are easily visible and protect pedestrians and vehicles from falling off the bridge.<br>• Repairing erosion damage - Repairing damage and placing minor protection works to avoid bridge structures from being undermined. |
| Vegetation | • Cutting and clearing vegetation - Cutting and removing vegetation that grows in the road reserve, shoulders or surface and which impedes visibility, restricts normal traffic, restricts the flow of runoff water away from the road, or is damaging the road, drainage system or other road elements |
| Traffic signs and road furniture | • Cleaning signs and road furniture - Cleaning existing signs and other road furniture so that they are legible and ensuring that sign posts are straight and properly anchored in the ground.<br>• Repairing and painting signs and road furniture - Repairing or painting signs and other road furniture, ensuring that sign posts are properly anchored in the ground and are easily legible. |
| Retaining walls and structures | • Cleaning weep holes - Clearing any material in the weep holes of retaining walls so that water behind the wall can drain out and does not cause damage to the wall.<br>• Creating retaining walls - Installing basic dry stone walls or gabions against slopes to avoid cuts in road shoulders and landslides. Such walls may complement existing retaining walls.<br>• Repairing minor damage - Replacement of loose stones and/or repair of gabion wiring in retaining walls, and small repairs to other structures.<br>• Repairing erosion damage - Placement of rocks and compacted earth where retaining walls and other structures are undermined by erosion to avoid them from collapsing. This is often complemented by the planting of vegetation to avoid damage from happening again. |
| Slopes | • Maintaining bioengineering features - Providing water to recently planted vegetative material and ensuring that it is properly rooted in the soil.<br>• Planting bioengineering features - Placing grass turf or other vegetative material obtained from areas close to the road on the shoulders and slopes of the road in order to avoid erosion and stabilize the soil.<br>• Removing hanging rocks - Removal of loose stones and soil from slopes above the road to avoid that these fall onto the road or result in landslides.<br>• Trimming side slopes – Trimming of sharp vertical slopes and irregular shaped bends in order to create a smooth and stable slope. |

## ANNEX 2: TOOLS AND SAFETY EQUIPMENT

| TOOLS | PURPOSE | # WORKERS SHARING | |
|---|---|---|---|
| | | TERAI | HILLS |
| Wheelbarrow / Doko | Transporting material to and from the worksite | 2-4 | 2-4 |
| Hoe / Faruwa / Kodalo | Excavating loose or soft soil or gravel | 2-3 | 2-3 |
| Pickaxe | Loosening hard soil | 3-5 | 2-3 |
| Shovel | Loading and throwing loose soil or gravel | 1 | 1 |
| Long handled shovel | Cleaning culverts | 1 per RMG | 1 per RMG |
| Rake | Spreading material | 2-3 | 2-3 |
| Curved knife / Sickle | Cutting vegetation | 2-3 | 2-3 |
| Machete / Khukuri | Cutting thick vegetation | 2-3 | 2-3 |
| Hand rammer | Compacting soil and gravel | 1 per RMG | 1 per RMG |
| Large crowbar | Loosening, breaking or moving larger rocks | 1 per RMG | 1 per RMG |
| Large Hammer + Chisel | Breaking larger rocks | - | 1 per RMG |
| Pulling rope | Assisting the worker with the shovel | 1 kg per RMG | 1 kg per RMG |
| Foot pump | Pumping wheelbarrow tyre | 1 per RMG | 1 per RMG |
| Plastic tubs | Removing water | 2-3 | - |
| Watering can | Carrying and spreading water | 1 per RMG | 1 per RMG |

| SAFETY EQUIPMENT | PURPOSE | # WORKERS SHARING | |
|---|---|---|---|
| | | TERAI | TERAI |
| Warning flags or safety cones | Indicating the presence of workers ahead | 1 set per RMG | 1 set per RMG |
| Safety vest | Identifying workers as RMG members | 1 | 1 |
| Hat / Cap | Protecting against the sun | 1 | 1 |
| Hard hat | Protecting against head injuries | 1 | 1 |
| Gloves | Protecting hands against injuries | 1 | 1 |
| Safety goggles | Protecting eyes from dust and injuries | 1 | 1 |
| Mask | Protecting against dust | 2 | 2 |
| Boots / Shoes | Protecting against sharp objects | 1 | 1 |
| Raincoat | Protecting against rain | 1 | 1 |
| First-aid kit | Treating injuries | 1 set per RMG | 1 set per RMG |

## ANNEX 3 : RMG FORMATION NOTICE

# NOTICE
# for the formation of Road Maintenance Group

The DDC of [Enter name of DDC] intends to form a Road Maintenance Group (RMG) for the maintenance of [Enter name and description of road]. The following numbers of maintenance workers are required to form the Road Maintenance Group.

| VDC | Start | End | Length | Number of workers |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total** | | | | |

The members of the Road Maintenance Group will be required to work together to maintain the road in good condition, carrying out basic cleaning and clearing works as well as minor repairs. The work will be [Enter full-time or half-time] and will be for a period of one year. The Road Maintenance Group will be paid a fixed monthly amount of NPR [Enter monthly payment] for the entire road if the road is in good condition. If certain parts of the road are not in good condition, deductions will be applied to the monthly payment.

Selection of the members of the Road Maintenance Groups will be according to the following selection criteria. It must be noted that previous experience with road works is not required, but is an advantage in the selection process. Ability to read and write and completed primary school are also not required, but are an advantage.

**TECHNICAL CRITERIA**

- The selected maintenance workers must be between 18 and 60 years of age
- The selected maintenance workers must be physically and mentally able to work on road maintenance
- The selected maintenance workers must live near the road to be maintained (reducing travel time)

**SOCIAL CRITERIA**

- The selected maintenance workers must be unemployed or employed less than 25% of their time
- The selected maintenance workers must be from the poorest people of the VDC
- Preference must be given to female candidates and participation of women should be promoted. At least 33% of selected maintenance workers must be women. Where possible, all selected maintenance workers should be women.
- At least 40% of the maintenance workers must be Dalits or Janajati, or be from other excluded and deprived groups

For more information, please contact the VDC Chairperson / Secretary or the District Technical Office. Interested candidates should contact the VDC Chairperson / Secretary and fill in the RMG Application Form before [Enter date by which the RMG Application Form should be submitted]. Within one week after the final application date, the RMG Application Forms will be evaluated and the RMG members will be selected.

## ANNEX 4 : RMG APPLICATION FORM

| RMG APPLICATION FORM | |
|---|---|
| Name | ..... |
| Surname | ..... |
| Identity document | ..... |
| Age | ..... |
| Place of residence | ..... |
| Gender | ☐Male ☐Female |
| Ethnicity/caste | ☐ Dalit ☐Janajati ☐Other |
| What sources of income does the candidate currently have? | ☐None<br>☐Temporary (e.g. migrant work, hired labour)<br>☐Fixed (e.g. agricultural land, permanent employment) |
| Does the candidate own any property? | ☐ None<br>☐Agricultural land<br>☐House<br>☐Shop or other business premises |
| How many family members does the candidate support? | ☐0-3 ☐4-6 ☐More than 6 |
| What is the education level of the candidate? | ☐Primary incomplete<br>☐Primary complete<br>☐Secondary complete or higher |
| Can the candidate read and write? | ☐Yes ☐No |
| What work experience does the candidate have? | ☐Construction activities<br>☐ Agricultural activities<br>☐Commercial activities<br>☐Other activities: |
| Does the candidate have experience working on roads?<br>If yes, what type of experience? | ☐Yes ☐No |
| Has the candidate ever worked as part of a team or group?<br>If yes, what kind of team? | ☐Yes ☐ No |
| Has the candidate ever filled leadership positions?<br>If yes, what kind of positions? | ☐Yes ☐ No |

**Note:** *This is the scoring card for the RMG Application Form. This should not be provided to the candidates and should only be used for determining the score of each candidate based on the information provided in their RMG Application Form.*

## ANNEX 5 : RMG APPLICATION FORM - SCORING CARD

| RMG APPLICATION FORM - SCORING CARD | | MAX |
|---|---|---|
| Name | ..... | - |
| Surname | ..... | - |
| Identity document | ..... | - |
| Age | ..... | - |
| Place of residence | ..... | - |
| Gender | ☐Male ☐Female (5) | 5 |
| Ethnicity/caste | ☐Dalit (10)<br>☐Janajati (5)<br>☐Other | 10 |
| What sources of income does the candidate currently have? | ☐None (10)<br>☐Temporary (e.g. migrant work, hired labour) (5)<br>☐Fixed (e.g. agricultural land, permanent employment) | 10 |
| Does the candidate own any property? | ☐ None (5)<br>☐ Agricultural land<br>☐ House<br>☐ Shop or other business premises | 5 |
| How many family members does the candidate support? | ☐0-3 ☐4-6 (5) ☐More than 6 (10) | 10 |
| What is the education level of the candidate? | ☐Primary incomplete<br>☐Primary complete (5)<br>☐Secondary complete or higher (5) | 5 |
| Can the candidate read and write? | ☐Yes (5) ☐No | 5 |
| What work experience does the candidate have? | ☐Construction activities (10)<br>☐Agricultural activities (5)<br>☐Commercial activities<br>☐ Other activities: | 10 |
| Does the candidate have experience working on roads?<br>If yes, what type of experience? | ☐Yes (30) ☐No<br>If relevant road work experience | 30 |
| Has the candidate ever worked as part of a team or group?<br>If yes, what kind of team? | ☐Yes (5) ☐No<br>If relevant team experience | 5 |
| Has the candidate ever filled leadership positions?<br>If yes, what kind of positions? | ☐Yes (5) ☐No<br>If relevant leadership experience | 5 |
| **TOTAL SCORE** | | **100** |

# ANNEX 6 : SAMPLE WORK PLAN

## WORK PLAN

Month: July
District: Dhanusha
Road Name: Hulaki road
Section: Aurahi VDC - Giddha VDC - Ekrahi VDC

| ROAD ELEMENT AND ACTIVITY | | Deuri Parwaha VDC | Aurahi VDC | Kaptaul | Aurahi Harusaha | Giddha VDC | Dumariya Nadi | Tinkauriya Chok | Ekrahi VDC | Ekrahi Kamala Main Canal | Machi Jhitkaiya VDC |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | km | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 11.5 |
| Road | Clearing landslides and obstacles | | | | | | | | | | | | | |
| Earthen or gravel surface | Repairing ruts, rills, gullies, potholes | | | | | | | | | | | | | |
| | Creating water bars | | | | | | | | | | | | | |
| | Creating stone pitching, paved drifts | | | | | | | | | | | | | |
| | Graveling | | | | | | | | | | | | | |
| Blacktop surface | Repairing potholes and edge breaks | | | | | | | | | | | | | |
| | Sealing cracks | | | | | | | | | | | | | |
| Road shoulder | Repairing ruts, rills, gullies, potholes | | | | | | | | | | | | | |
| | Repairing cuts and improving shoulders | | | | | | | | | | | | | |
| | Removing banks | | | | | | | | | | | | | |
| Drains | Clearing drains | | | | | | | | | | | | | |
| | Repairing erosion and other damage | | | | | | | | | | | | | |
| | Creating earthen drains | | | | | | | | | | | | | |
| Culverts | Clearing culverts | | | | | | | | | | | | | |
| | Repairing backfill over culverts | | | | | | | | | | | | | |
| Bridges and causeways | Clearing drifts and causeways | | | | | | | | | | | | | |
| | Clearing bridges | | | | | | | | | | | | | |
| | Maintaining expansion joints + bearings | | | | | | | | | | | | | |
| | Maintaining railings and safety barriers | | | | | | | | | | | | | |
| | Repairing erosion damage | | | | | | | | | | | | | |
| Vegetation | Cutting and clearing vegetation | | | | | | | | | | | | | |
| Traffic signs + road furniture | Cleaning signs and road furniture | | | | | | | | | | | | | |
| | Repairing/replacing signs | | | | | | | | | | | | | |
| Retaining walls | Clearing weep holes | | | | | | | | | | | | | |
| | Creating retaining walls | | | | | | | | | | | | | |
| | Repairing minor damage | | | | | | | | | | | | | |
| | Repairing erosion damage | | | | | | | | | | | | | |
| Slopes | Maintaining bioengineering features | | | | | | | | | | | | | |
| | Planting bioengineering features | | | | | | | | | | | | | |
| | Removing hanging rocks | | | | | | | | | | | | | |
| | Small back cutting on side slopes | | | | | | | | | | | | | |

Prepared by: _____
Maintenance Engineer/Sub-Engineer

Date:

Agreed by: _____
RMG Chairperson

Date:

# ANNEX 7 : BASIS FOR WORK VOLUME CALCULATION

| WORK VOLUME CALCULATION SHEET | | | | | | | |
|---|---|---|---|---|---|---|---|
| Month | | | | | | | |
| Road | | | | | | | |
| Road length (km) ❶ | | | | | | | |
| RMG name | | | | | | | |
| **CALCULATION** | | | | | | | |
| Road element | Maintenance activity | Task rate unit | Proposed task rate range (units/ personday) | Applied task rate (units/ personday) ❷ | Planned volume (check units) ❸ | Required person days ❹ = ❸/❷ | Location (chainage) |
| Road | Clearing landslides and obstacles | $m^3$ | 3 - 4 | | | | |
| Earthen or gravel surface | Repairing ruts, rills, gullies, potholes | $m^2$ | 10 - 15 | | | | |
| | Creating waterbars | m | 20 - 40 | | | | |
| | Creating stone pitching, paved drifts | $m^2$ | 2 - 3 | | | | |
| | Graveling | $m^2$ | 6 - 8 | | | | |
| Paved surface | Repairing potholes or fixing edge break | $m^2$ | 5 - 10 | | | | |
| | Sealing cracks | m | 100 - 150 | | | | |
| Road shoulder | Repairing ruts, rills, gullies, potholes | $m^2$ | 10 - 15 | | | | |
| | Repairing cuts and improving shoulders | $m^3$ | 2 - 3 | | | | |
| | Removing banks | $m^3$ | 3 - 4 | | | | |
| Drains | Clearing drains | m | 100 - 200 | | | | |
| | Repairing erosion and other damage | $m^3$ | 2 - 4 | | | | |
| | Creating earthen drains | m | 20 - 40 | | | | |
| Culverts | Clearing culverts | unit | 1 - 3 | | | | |
| | Repairing backfill over culverts | $m^3$ | 2 - 3 | | | | |
| Bridges and causeways | Clearing drifts and causeways | $m^3$ | 3 - 4 | | | | |
| | Clearing bridges | unit | ½ - 1 | | | | |
| | Maintaining expansion joints + bearings | unit | 1 - 2 | | | | |
| | Maintaining railings and safety barriers | unit | ¼ - ½ | | | | |
| | Repairing erosion damage | $m^3$ | 2 - 4 | | | | |
| Vegetation | Cutting and clearing vegetation | $m^2$ | 300 - 400 | | | | |
| Traffic signs + road furniture | Cleaning signs and road furniture | unit | 10 | | | | |
| | Repairing/replacing signs | unit | 5 | | | | |
| Retaining walls | Clearing weep holes | unit | 50 | | | | |
| | Creating retaining walls | $m^3$ | 1 - 1½ | | | | |
| | Repairing minor damage | $m^3$ | 1 - 1½ | | | | |
| | Repairing erosion damage | $m^3$ | 2 - 4 | | | | |
| Slopes | Maintaining bioengineering features | $m^2$ | 50 - 100 | | | | |
| | Planting bioengineering features | $m^2$ | 15 - 25 | | | | |
| | Removing hanging rocks | $m^2$ | 2 - 3 | | | | |
| | Small back cutting on side slopes | $m^3$ | 1.4 - 2.0 | | | | |
| Other | Other activity | | | | | | |
| **CONCLUSION** | | | | | | | |
| Average number of person days per month | | | ❺ = ❶ * input level / 12 | | | | |
| Total person days required in this month | | | ❻ = sum ❹ | | | | |

**Note 1:** The total number of person days for a particular month may differ from the average number of persondays per month, as long as the total person days for a year are equal to the road length * input level.
**Note 2:** This sheet serves to ensure that the work volumes assigned to the RMG are in line with the available person days/km/year. The RMG is responsible for completing the assigned work plan and work volumes. This sheet is not to be provided to the RMG.

# ANNEX 8 : TIMING OF MAINTENANCE ACTIVITIES

| BEFORE THE RAINY PERIOD |
|---|
| • Clearing drains<br>• Clearing culverts<br>• Clearing drifts and causeways<br>• Clearing under bridges<br>• Clearing bridges, spouts and weep holes<br>• Repairing drains<br>• Creating earthen drains<br>• Creating stone-paved drifts<br>• Creating dry stone retaining walls<br>• Cutting and clearing vegetation<br>• Sealing pavement cracks<br>• Removing hanging rocks<br>• Removing shoulder banks<br>• Creating waterbars |
| **DURING THE RAINY PERIOD** |
| • Clearing of landslides and obstacles<br>• Clearing drains<br>• Clearing culverts<br>• Clearing drifts and causeways<br>• Clearing under bridges<br>• Clearing bridges, spouts and weep holes<br>• Repairing drains<br>• Removing shoulder banks<br>• Creating earthen drains<br>• Creating waterbars<br>• Creating stone-paved drifts<br>• Creating dry stone retaining walls<br>• Removing hanging rocks<br>• Planting bioengineering features<br>• Repairing ruts, rills, gullies, potholes, corrugations - in major problem areas<br>• Repairing pavement potholes and edge breaks - in major problem areas<br>• Repairing cuts and improving shoulder - in major problem areas<br>• Cutting and clearing vegetation - in major problem areas |
| **AFTER THE RAINY PERIOD** |
| • Clearing of landslides and obstacles<br>• Repairing ruts, rills, gullies, potholes, corrugations<br>• Repairing cuts and improving shoulder<br>• Cutting and clearing vegetation<br>• Repairing the backfill over culverts |
| **DURING THE DRY PERIOD** |
| • Repairing ruts, rills, gullies, potholes, corrugations<br>• Repairing pavement potholes and edge breaks<br>• Repairing pavement ravelling and stripping<br>• Sealing pavement cracks<br>• Repairing cuts and improving shoulder<br>• Maintaining expansion joints and bearings<br>• Maintaining railings and safety barriers<br>• Repairing erosion damage to bridges<br>• Repairing retaining walls and structures<br>• Repairing the backfill over culverts<br>• Creating dry stone retaining walls<br>• Stone pitching and graveling<br>• Small back cutting side slopes<br>• Cleaning signs and road furniture<br>• Repairing and painting signs and road furniture |

# ANNEX 9 : MAINTENANCE WORK INSPECTION FORM

| INSPECTION FORM<br>GENERAL INFORMATION | | | | |
|---|---|---|---|---|
| Inspection period (month) | | | | |
| Name of inspector | | | | |
| Date of inspection | | | | |
| Road name and length | | | | |
| Road section start and end | | | | |
| Name of RMG | | | | |
| RMG chairperson's name | | | | |
| RMG chairperson's phone number | | | | |
| **INSPECTION RESULTS** | | | | |
| Road element | In order | Deficient | Not applicable | Problems to be corrected |
| Road (obstructions) | | | | |
| Earthen or gravel surface | | | | |
| Blacktop surface | | | | |
| Road shoulder | | | | |
| Drains | | | | |
| Culverts | | | | |
| Bridges and causeways | | | | |
| Vegetation | | | | |
| Traffic signs and road furniture | | | | |
| Retaining walls and structures | | | | |
| Slopes | | | | |
| **CONCLUSION** | | | | |
| Standard Monthly Payment including allowances as per contract (NPR)❶ | | | | |
| Deduction (NPR)<br>(copy to Attendance Sheet) ❷ | None NPR _____ | | | |
| Approved Monthly Payment (NPR)<br>(copy to Attendance Sheet) ❸= ❶ - ❷ | | | | |
| Number of person-days spent<br>(copy from Attendance Sheet) | | | | |
| Signature inspector | | | | |
| Signature RMG chairperson | | | | |

**Note:** The amount of deduction is calculated by determining the volume of work not completed in accordance with the work plan and the performance standards, and multiplying this by the task rate for the activity concerned and the daily wage for the district concerned: (deduction = uncompleted work volume x task rate x daily wage rate).

# ANNEX 10 : ATTENDANCE SHEET

## ATTENDANCE AND PAYMENT DISTRIBUTION SHEET

| | |
|---|---|
| Reporting period (month): | |
| Road name and length: | |
| RMG name: | |

## HOURS WORKED

| Name of member | Date (enter the number of hours worked each day by each RMG member) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | Total hours ❶ | Total standard days ❷ = ❶ / 8 | Wage payment ❼ = ❻ / ❸ * ❷ | Signature (upon receipt) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 | 31 | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total person days by RMG members ❸=sum ❷ | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

## CONCLUSION

| | |
|---|---|
| Monthly wage payment as per contract (NPR) ❹ | |
| Deduction as per Inspection Form (NPR) ❺ | |
| Approved wage payment as per Inspection Form (NPR) ❻=❹ - ❺ | |
| Signature RMG chairperson | |
| Signature inspector | |

# ANNEX 11 : SAMPLE CONTRACT TEMPLATE

## MAINTENANCE Contract

## Between

*[Enter name of DDC]*

## and

*[Enter name of RMG]*

This contract describes the road maintenance activities to be undertaken in [Enter road name or description] over a total length of [Enter length of road] km from chainage [Enter start chainage] to chainage [Enter end chainage], involving a total of [Enter number of maintenance workers in RMG] maintenance workers. The duration of this contract is [Enter number of months] months starting from [Enter start date] up to [Enter end date].

Maintenance activities

The maintenance activities to be carried out under this contract consist of routine cleaning and clearing activities complemented by minor recurrent repairs and minor specific maintenance aimed at the creation of basic road protection measures. As part of this contract, the following maintenance activities may be carried out:

| ROAD ELEMENT | RMG MAINTENANCE ACTIVITIES |
|---|---|
| Road | Clearing landslides and obstacles |
| Earthen or gravel surface | Repairing ruts, rills, gullies, potholes, corrugations<br>Creating water bars<br>Creating dry stone pitching, stone-paved drifts<br>Graveling |
| Blacktop surface | Repairing potholes and edge breaks<br>Sealing cracks |
| Road shoulder | Repairing ruts, rills, gullies, potholes<br>Repairing cuts and improving shoulder<br>Removing banks |
| Drains | Clearing drains<br>Repairing erosion damage<br>Creating earthen drains |
| Culverts | Clearing culverts<br>Repairing backfill over culverts |
| Bridges and causeways | Clearing drifts and causeways<br>Clearing under bridges, bridge deck, bridge spouts, weep holes and vegetation<br>Cleaning expansion joints and lubricating bridge bearings<br>Cleaning, painting and repairing bridge railing and safety barriers<br>Repairing erosion damage and placing minor protection works |
| Vegetation | Cutting and clearing vegetation |
| Traffic signs and road furniture | Cleaning signs and road furniture<br>Repairing/replacing signs and road furniture |
| Retaining walls and structures | Cleaning weep holes<br>Creating retaining walls<br>Repairing minor damage<br>Repairing erosion damage |
| Slopes | Maintaining bioengineering features<br>Planting bioengineering features<br>Removing hanging rocks<br>Trimming side slopes |

Any repairs required to the road that are beyond the scope of the maintenance activities listed above, must be reported to the DDC. The RMGs will receive tools and safety equipment from the DDC to carry out the maintenance activities. Accident insurance will also be provided for the RMG members.

**Monthly work plan**

At the start of each month a work plan is prepared together with the DDC/DTO that indicates which activities will be carried out and in which sections of the road these will be carried out. The road maintenance group is responsible for planning and organising its members to carry out the activities indicated in the work plan during the course of the month, ensuring that all work indicated in the work plan is completed by the end of the month. The work plan forms the basis for the activities to be undertaken, although additional activities may come up according to need. Increasingly, the road maintenance group will be made responsible for working out the work plan, which will need to be approved by the DDC/DTO.

**Inspections and performance standards**

The work carried out is assessed during monthly inspections. The quantity of work carried out is compared to the work plan for that month. The quality of the work carried out is compared to the performance standards that are defined below. If the quantity and quality of work complies with the work plan and performance standards, the full monthly payment as indicated at the end of this contract is approved. Where quantity or quality do not fully comply with the performance standards or work plan, a deduction may be applied to this monthly payment. The amount of this deduction is based on the amount of work estimated to be unsatisfactory. During each monthly inspection, an Inspection Form will be filled in, identifying any deficiencies found in the road, as well as the exact amount of any deduction applied and the resulting monthly payment approved for the RMG.

**PERFORMANCE STANDARDS**

Road - There are no small landslides (less than 5 cubic metres), materials or other obstacles on the road surface, road shoulder, or side drains. In the case of large landslides (more than 5 cubic metres), these have been reported to the DDC/DTO. Vehicles are able to pass and water does not flow over the road.

Earthen or gravel surface - There are no remarkable potholes (>60x15 cm), no ruts, rills or gullies (>15cm deep), and no corrugation (>7 cm deep) which disturb the regular movement of traffic. Repairs to gravel surfaces have been made using suitable gravel material. In areas subject to longitudinal erosion, diagonal diversion ditches have been created at regular intervals to guide the water away from the road. Where water crosses the road, stone-paved drifts have been created. In case of stone pitching, the stones are well anchored in the ground, do not stick out, and there are no missing stones. Water does not flow over or remain on the road.

Blacktop surface - There are no remarkable potholes (>30x10cm) which disturb the regular movement of traffic. The potholes can be repaired with locally available materials. There is no significant edge break that reduces the width of the pavement. The length of unsealed cracks is less than 5 metres per kilometre of road. There are no unsealed cracks wider than 0.5 centimetres. The area affected by stripping or ravelling is less than 50 square metres per kilometre of road.

Road shoulder - There are no remarkable potholes (>30x10cm) and no ruts or rills (>10 cm deep). There are no uninterrupted banks on the road shoulder for more than 10 metres. Water does not flow over or remain on the road shoulder.

Drains - Less than one-quarter of the cross section at any point in the side drain is blocked. The drain is at least 15 centimetres wide and 10 centimetres below the road surface. There are no sharp curves in the drain and the drain has a proper outlet. Water can flow freely through the side drain, and there is no erosion of the drains. Water does not flow over the road surface or shoulder.

Culverts - Less than one-quarter of the culvert height at any point in the culvert is blocked, the inlet and outlet are clear, water can flow freely through the culvert, and there is no erosion at the inlet or outlet. The backfill over the culverts is at least one-quarter of the culvert diameter.

Causeways and Bridges - Drifts and causeways are free of sedimentation and are able to drain freely. Less than one-tenth of the cross section of the bridge is blocked, and the areas 5 metres on either side of the bridge are clear of obstructions. Water can flow freely under the bridge. The bridge deck, spouts and weep holes are clean. There is no vegetation growing in the crossing structures. Bridge railings are clean and covered in paint. Bridge bearings are clean and lubricated. Bridge expansion joints are clear. There is no damage to the approach road and bridge deck and cracks are sealed. Minor erosion has been repaired and protection measures are in place. Large damage to or erosion of the bridge structure has been reported to DDC/DTO.

Vegetation - Vegetation within 1 metre of the road is less than 30 centimetres high (except trees), vegetation protruding over the road is at least 2.50 metres above the road surface, and the flow of water away from the road is not restricted. Vegetation on slopes is not removed, only cut short.

Traffic signs and road furniture - All traffic signs and road furniture are clean and legible (painted where necessary). Sign posts are straight and well anchored in the ground. Any damaged or missing signs have been reported to the DDC/DTO.

Retaining walls and structures - The retaining walls and structures are in good condition and the area behind them is compacted. There are no loose stones or other damage to the retaining walls, and weep holes are clear. There is no damage by erosion undermining the retaining walls and structures. Large damage to retaining walls and structures has been reported to the DDC/DTO.

Slopes - The slopes and road shoulders prone to erosion have been planted with vegetative material. The plants are not dried out and well anchored to the soil. There are no loose stones or other material on the slopes and road side slope should be in stable condition.

Note 1: These performance standards are for internal control mechanism, not fully comply in monsoon season and just basis for monitoring.
Note 2: Above performance standard can be considered as basis for monitoring as defined in note 1 only on last worked or maintained section of the road by RMGs not before than 1 month.
Payments and allowances
The RMG will receive monthly wage payments as well as a monthly transport allowance, a monthly administration allowance and a monthly tool maintenance allowance. These are fixed monthly amounts as indicated below. The payment is made as one single monthly payment.

| DESCRIPTION | AMOUNT (NPR) |
|---|---|
| Monthly wage payment | Enter amount |
| Monthly transport allowance | Enter amount |
| Monthly administration allowance | Enter amount |
| Monthly tool maintenance allowance | Enter amount |
| Standard Monthly Payment (in case of good performance) | Enter total amount |

In case of good performance, the Standard Monthly Payment is paid in full, but in case performance does not comply with the work plan or the performance standards, the Standard Monthly Payment may be reduced by applying a deduction. The exact amount of the deduction will be defined in the monthly inspection reports, taking into account the degree of non-compliance with the work plan or performance standards. The Approved Monthly Payment after application of any deductions is paid to the RMG as a single payment.

At the discretion of the DDC/DTO, payments may be made either to the road maintenance group as a whole or to individual members. In case of group payments, the road maintenance group is responsible for the correct distribution of wages amongst its members and this will be monitored by the DDC/DTO based on the Attendance Sheet. In case of individual payments, the distribution of the payment to the members of the road maintenance groups will be determined by the DDC/DTO based on the days worked by each group member as recorded in the Attendance Sheet. By signing this contract, the RMG agrees to present its accounts for public audit if so required by the DDC.

**Employment status**
This contract forms a procurement contract between a public entity (the DDC/DTO) and a service provider (the RMG) for a fixed duration of time. It does not give any entitlement to extension or renewal of the contract beyond the stipulated duration, nor does it give any entitlement to the RMG members for continued employment by the DDC/DTO or any other public entity. Under this contract, the RMG is considered to be a service provider for the DDC/DTO. RMG members are not considered government employees, nor do they qualify for any entitlements related to government employees.

**RMG members**
The RMG in this contract includes the following members:
1. [Enter full name and address of RMG Chairperson] (Chairperson)
2. [Enter full name and address of RMG Treasurer] (Treasurer)
3. [Enter full name and address of RMG member]
4. [Enter full name and address of RMG member]
5. [Enter full name and address of RMG member]
6. [Enter full name and address of RMG member]
7. [Enter full name and address of RMG member]

**On behalf of the Employer:**

(DDC/DTO)

Name:

(LRUC/Road Project if exist)

Name:

**On behalf of the RMG:**

(Chairperson)

Name:

(Treasurer)

Name:

RMG receiving monthly wage from Bank

RMG receiving health Checkup at Health post

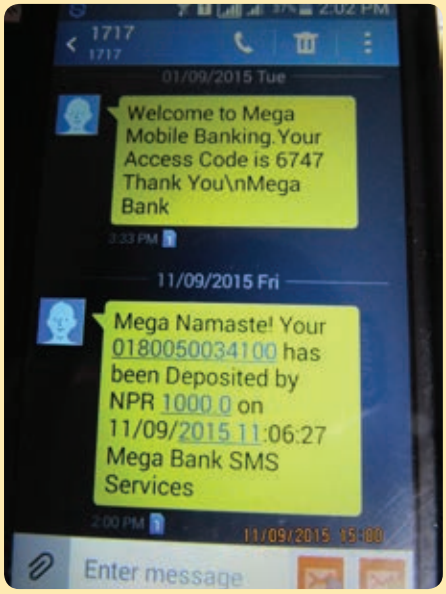
RMG receiving First Aid Training

RMG receiving wages from ATM

Road side plantation

Bio-engineering by RMG

RMG Ready for work




SMS alert for monthly wage

GOVERNMENT OF NEPAL
**MINISTRY OF FEDERAL AFFAIRS AND LOCAL DEVELOPMENT**
**DEPARTMENT OF LOCAL INFRASTRUCTURE DEVELOPMENT AND AGRICULTURAL ROADS (DOLIDAR)**
Harihar Bhawan Pulchowk, Lalitpur, Nepal
**Tel:** 00977-1-5555001
**Web:** dolidar.gov.np