

Government of Nepal
Ministry of Local Development

National Plan for Rural Road Maintenance-2056
(2001 AD)

Department of Local Infrastructure Development and
Agricultural Roads (DoLIDAR)

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Acronyms and Abbreviations

ADMP	Annual District Maintenance Programme
ANMP	Annual National Maintenance Programme
APP	Agriculture Perspective Plan
CBO	Community Based Organisation
DDC	District Development Committee
DIARS	District Infrastructure and Agricultural Roads Section
DoI	Department of Irrigation
DoLIDAR	Department of Local Infrastructure Development and Agricultural Roads
DoR	Department of Roads
DRRMF	District Rural Road Maintenance Fund
DTMP	District Transport Master Plan
HMGN	His Majesty's Government of Nepal
INGO	International Non-Government Organisation
km	kilometre
MLD	Ministry of Local Development
MoF	Ministry of Finance
NEA	Nepal Electricity Authority
NGO	Non-Government Organisation
NPC	National Planning Commission
Rehab.	Rehabilitation
RRMP	Rural Road Maintenance Plan
SDE	Senior Divisional Engineer
sq.km.	square kilometre
ToR	Terms of Reference
UGs	Users' Groups
VDC	Village Development Committee
WBM	Water Bound Macadam

Nepal, with a per capita income around US\$ 200 per annum (*World Bank, 1997*), is one of the least developed countries in the world. Adding to this, it has one of the most scattered rural road networks in the South Asian sub-region which limits the effective and comprehensive participation of rural population in the country's economic growth process. Almost 90 percent of the Nepali population lives in rural areas and much of the employment and income generation in rural areas depends directly or indirectly on agriculture. Therefore, the living standard of rural people cannot be improved unless the reliable access to agriculture services and technological advancement as well as the markets to agricultural products are guaranteed with respect to the growing demand. To improve the living condition of rural people, or in other words, to reduce the rural poverty, the basic human facilities such as health services, education and communication should also be made available to these communities. A reliable rural road network, though an expensive investment, is the answer to many concerns and will be the key factor in stimulating economic activities in the rural areas. That is why the Government has given its top priority to the eradication of poverty through the agricultural development and indicated its commitment to the 20-year Agriculture Perspective Plan (APP).

In the Ninth National Development Plan (1998-2002), bringing rural population into the mainstream of development through the sectors like agriculture, water resources, tourism, rural infrastructure and agro-based industries receives a prime importance. The Ninth Plan further highlights that the decentralisation of programmes (especially human resource development and rural infrastructure) as a mechanism for involving local communities in the development process is one of the meaningful means of alleviating the poverty. As envisaged by the APP document, expanding the present road network from 6 km to 11 km per 100 km² and maintaining it to the operational standards or serviceable conditions should receive the highest attention.

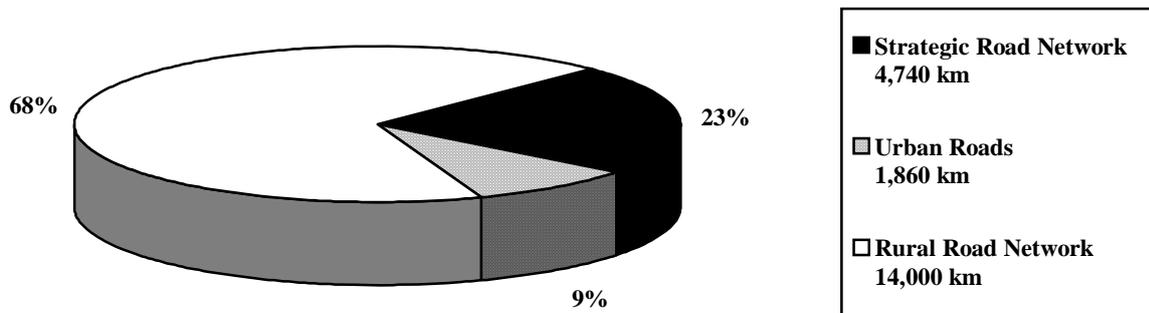
There is, at present, a network of about 14,000 km of rural roads (including motorable tracks) in the country¹. Rural roads represent about 68% of the entire public road length. These roads link rural areas of 58 districts which are already connected by the national strategic road network². The strategic road network and the urban roads constitute about 6,600 km of length by making the entire public road length to be 20,600 km (refer to **Graph 1**). It shows the present road density of Nepal as 14 km per 100 km², a rather surprising figure with respect to the APP target. This indicates that most of the districts connected with the

¹ **Rural road network** generally comprises of district roads (Class 'A') and a network of agricultural and village roads (mostly Class 'B'). The Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) is responsible for regulating the development of rural road network whereas the respective District Development Committees (DDCs) are supposed to develop, own, operate and maintain the network. Refer to **Annex I**. Out of 14,000 km of rural roads, there are about 6,600 km of district roads.

² **National strategic road network** comprises of national highways, feeder roads and other roads of national importance. The Department of Roads (DoR) is responsible for the development and maintenance of strategic network.

strategic road network have got enough length of rural road network against the planned long-term targets !

Graph 1
National Road Network by Ownership
 Total length 20,600 km



Because of spontaneous efforts, ad-hoc construction methods and absence of proper technical back-up, most of these roads are, however, of sub-standard quality and lack sufficient road-side and cross-drainage structures. As such, they require a great deal of attention in order to be qualified as serviceable roads. There are several reasons for this state of affair. Some of the main reasons are as follows:

- The importance given to the opening up of more and more new motorable accesses at the cost of maintaining the rapidly deteriorating existing ones;
- The practice of ad-hoc distribution of available funds amongst electorates rather than allocating them on planned basis;
- Insufficient funds for road maintenance;
- Lack of interest to road maintenance;
- Inadequate technical capacity (manpower, equipment, skills, etc.);
- Lack of appropriate institutional and legal provisions supporting the maintenance aspects.

Given its steep and fragile mountainous terrain, varied climate and unstable geological structure, Nepal has also inherited one of the most vulnerable environments for natural disasters. Even the roads that are of standard quality are frequently subjected to natural damages such as slips, land slides, run-off cuts, scouring of side slopes and uneven settlements. Often, huge amounts of sediments and debris carried by the flood water block the cross-drainage structures resulting a complete washout of structures as well as the damages to road formations. Nearly 85% of rural roads is having earthen surface, and most of which are operational only during the dry season. During the monsoon rains, all weather earthen roads are the ones subjected to severe damages as no restrictions are imposed to regulate the heavy vehicular traffic. In some cases, there has been a huge, recurrent

expenditure on the maintenance. However, in many cases, the maintenance aspect has been completely neglected due to lack of resources. As a consequence, the backlog of road maintenance is ever increasing rendering the present rural road network unserviceable.

During the last couple of years, His Majesty's Government of Nepal (HMGN) has allocated a substantial amount of funds to the local governing institutions in the form of block or programme grants, a large chunk of which is being spent on rural roads. In addition, HMGN allocates a considerable portion of its scarce resources every year for the maintenance of its rural road network. **Table 1** shows the present trend of allocation of different district block grants (refer to **Annex II** for district-wise details).

Table 1 : Present Trend of Allocation of Different Block Grants

Year	Annual Allocation (NRs. '00,000)		
	Rural Road Grant	Other Block Grant	Total District Block Grant
1996/97	1,763	3,984	5,747
1997/98	1,763	4,489	6,252
1998/99	1,763	4,540	6,303

Despite these efforts, the public was not able to enjoy the desired benefits of the investments mainly due to the above-mentioned reasons. Attending to this situation, HMGN formulated the **National Strategy for Rural Infrastructure Development** in December 1997. Following the strategy, the Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR) was established under the Ministry of Local Development (MLD), particularly for regulating the development and maintenance of rural road network. On this background, the Government has prepared a **maintenance plan** for increasing the efficiency and effectiveness of road maintenance activities. The maintenance plan clearly addresses the key issues of concerns such as allocation of adequate resources, proper utilisation of available funds, enhancement of requisite skills and adoption of appropriate institutional arrangements. The Government is confident that with the implementation of this **maintenance plan**, the objectives laid down in the **national strategy** for the rural road sector will be fulfilled.

A road is a major capital investment and it is necessary to preserve it by means of an appropriate maintenance done at an appropriate time. Failure to maintain the road properly leads to rapid deterioration with subsequent increase in vehicle operating cost and road accidents and eventually demands for an expensive reconstruction. Road maintenance may be defined as a function of keeping the roadways, roadside structures, cross-drainage structures and other facilities in the best possible condition to ensure reliable and safe transportation along the roadways. It will (i) minimise the rate of deterioration of the road and thus prolong its life; (ii) provide better running surface and thus reduce the cost of vehicle operation; and (iii) ensure reliable and safe transport services.

2.1 Definition of rural road

A rural road may be defined as a motorable road or an agricultural road or a motorable track owned, regulated and maintained by the local governing institutions. These roads may have either earthen or gravelled or paved surface and are operational either during a part of or throughout the year.

In the districts, the key arterial roads linking the villages (often referred to as ‘District Roads’) combined with other auxiliary network of village roads form the ‘*Rural Road Network*’. The roads within the municipality areas (often referred to as ‘Urban Roads’) are, however, not considered as rural roads. For the purpose of this **maintenance plan**, all rural roads are supposed to be owned, regulated and maintained by the local governing institutions. The roads in the district which are either built and/or regulated and/or maintained under the jurisdiction of other agencies like Department of Roads (DoR), Department of Irrigation (DoI), Nepal Electricity Authority (NEA), Royal Nepalese Army, etc. are not eligible to become rural roads until the ownership of these roads are handed over to the respective local governing institutions.

2.2 Classification of rural roads

The rural roads may be classified according to the following criteria:

- i. Serviceability condition
 - All-weather roads (*passable throughout the year*)
 - Fair-weather roads (*passable only a part of the year*)
- i. Pavement (or surface) material

- Earthen roads (*just the road formation; no pavement*)
- Gravelled/WBM roads (having gravelled or WBM surface)
- Black-topped roads (*paved with Asphalt as binding material*)

i. Importance

- Class ‘A’ (*District Roads - main rural roads*)
- Class ‘B’ (*Village Roads - auxiliary rural roads*)

2.3 Categorisation of rural roads according to maintenance needs

All rural roads in Nepal may fall under the following categories according to their maintenance requirements.

i. Maintainable roads (*roads built according to proper engineering standards*)

- Routine or regular maintenance (*required to keep the road operational at all times; needs nominal funds*)
- Periodic or planned maintenance (*required to deal with major repairs demanded over a set period of time; needs considerable amount of funds which basically depends upon the frequency of its intervention*)
- Rehabilitation (*required when the road is not serviceable even after the routine and periodic maintenance; needs a lot of resources and a great effort to bring it to serviceable condition; may include the activities such as redesigning, realigning, reconstruction and upgrading*)

ii. Non-maintainable roads (*These roads mainly refer to sub-standard roads or tracks built through spontaneous efforts and ad-hoc construction methods without following engineering standards; cannot bring them up to serviceable condition simply by rehabilitation; require almost the same resources and efforts needed for constructing a new road*) This **maintenance plan** does not address these roads as they need to be constructed as new roads.

2.4 Objectives of maintenance

It is important to recognise that, as with most infrastructure maintenance, road maintenance is not intended to prolong the life of a road into perpetuity. Roads of any type will deteriorate over time due to the twin forces of ageing and use. The **objective of maintenance**, therefore, is to lessen the deterioration effects of these two forces vis a vis providing for increased service performance of the road in the short run.

From an engineering point of view, there is a set of interventions that are required over the life of a road. The following are the key maintenance interventions in rural roads:

- routine or regular maintenance;
- periodic or planned maintenance;
- rehabilitation (redesigning, realigning, reconstruction and upgrading).

Optimal timing of these interventions depends primarily on climate, traffic levels and the original quality of construction. The specific activities to be carried out, however, depend on the type of road surface.

2.5 Scope of various maintenance interventions

Routine Maintenance:

All minor maintenance works which are of regular nature and can not be accurately estimated or measured are categorised under routine maintenance. It covers the work involved in keeping the road in proper shape and in protecting it from deterioration. Generally, routine maintenance does not require skilled labour.

The following works may fall under this heading:

- Safety inspection and removal of obstructions;
- Cleaning of culverts and bridges;
- Cleaning of mitre and side drains;
- Filling and compaction of potholes;
- Trimming of road edges for water shedding;
- Reshaping carriageway and compaction;
- Removal of small-sized slides/slips that fall on the road surface;
- Cutting grass, bushes and branches of trees for visibility splays;
- Maintaining trees along the road sides;
- Clearing of vegetation from drainage paths;
- Maintaining and placing of road signs and delineators;
- Any other simple works.

Periodic Maintenance:

All maintenance works that are of higher volume and to be carried out periodically shall be categorised under periodic maintenance. These works, requiring skilled labour can be planned and estimated. The following activities are common in practice.

- Re-cambering and re-grading of the road surfaces for longer stretches, in case of earthen and gravelled roads;
- Regravelling on carriageway and shoulders;

- Pavement repairs such as resealing, surface dressing or overlaying, in case of black-topped roads;
- Removal of medium and large-sized earth slips and associated preventive works;
- Repair of scour checks and the damaged portions of side drains;
- Repairing erosion on shoulders and planting grass;
- Repairing or replacing of earth retaining walls (dry stone, masonry or gabion);
- Repairing, replacing or adding of parapet walls and railings at bridges and culverts;
- Repairing, replacing or adding of guard walls at road sides;
- Repairing works on abutments, wing walls or apron/cut-off walls at bridges and culverts;
- Construction of small-scale river training structures; and
- Preparation of road-side nurseries and planting of trees, bushes and other vegetative cover wherever necessary.

Many of the above activities can be delayed and consequently, their costs can be diminished by proper application of routine maintenance activities. Nevertheless, they will have to be undertaken lest the roads reach a state of deterioration where even the routine maintenance activities are no longer beneficial.

Emergency repair works also fall under the category of periodic maintenance. These repair works are necessary to ensure the free movement of traffic which is either obstructed by or vulnerable to a rapid and unexpected deterioration of road condition. Such accidental damages may occasionally be caused by natural calamities or the sudden failure of structures. Dealing with a major or unexpected landslide just after the road construction can be considered as an emergency maintenance.

Rehabilitation (redesigning, realigning, reconstruction and upgrading):

Routine and periodic maintenance programmes alone may not be sufficient all the time to upkeep the road to the required standard. Upon heavy use, the road may be subjected to a rapid deterioration mainly due to the fatigue failure of materials. Sometimes, the unexpected natural causes such as landslides, earthquakes and floods may also expedite this process, causing a sudden lowering of road's quality with respect to serviceability, comfort, reliability and safety. When a certain stretch of such road requires a considerable intervention, it is subjected to a process called **rehabilitation** which may comprise of activities such as '*redesigning*', '*realigning*', '*reconstruction*' and '*upgrading*'. The following works may fall under rehabilitation.

- Reconstruction of road pavements for longer stretches;
- Reconstruction and/or addition of road structures;
- Reconstruction and/or addition of cross and road side drainage structures;
- Strengthening and/or construction of slope protection structures;
- Improvement of geometric standards of the road;
- Upgrading of road surfaces;
- Any other works deemed necessary to make the road intact.

2.6 Unit maintenance cost

The deterioration of a road depends on the pavement standards used in original construction, its traffic level, climate and the environment. Therefore, the maintenance cost is, in part, a function of construction cost, itself. In addition, current maintenance cost also depends, in part, on deterioration of road surface which, in turn, is affected by past maintenance at any particular time. Thus, maintenance cost of a rural road broadly depends on the following factors:

- Level of deterioration of road formation, its surface and structures;
- Available technology for maintenance;
- Quality of original design and construction;
- Prices of inputs; and
- Existing maintenance management practices.

Therefore, it shows calculating a unit maintenance cost is rather complicated task with reference to the above-mentioned variables. However, for the purposes of financial planning and realistic fund allocations, the following indicative unit costs are adopted for routine maintenance, periodic maintenance and rehabilitation (see **Table 2(a) & 2(b)**).

These indicative unit costs are derived on the assumption that the labour-based, local resource-oriented, environment-friendly construction techniques are applied in rural road maintenance. This is in line with the objectives set out in the *National Strategy for Rural Infrastructure Development* as well as in the *Ninth National Development Plan*.

Table 2 (a) : Indicative Unit Maintenance Cost

Type of Road	Unit Maintenance Cost for		
	Routine Maintenance NRs(US\$)/km	Periodic Maintenance NRs(US\$)/km	Rehabilitation NRs(US\$)/km
Earthen	14,000 (200)	100,000 (1,500)	300,000 (4,500)
Gravelled/WBM	21,000 (300)	150,000 (2,250)	600,000 (9,000)
Black-topped	42,000 (600)	300,000 (4,500)	1,200,000 (18,000)

Table 2 (b) : Frequency of Maintenance Intervention

Type of Road	Frequency of		
	Routine Maintenance	Periodic Maintenance	Rehabilitation
Earthen	<i>every year</i>	<i>once in two years</i>	<i>whenever required</i>
Gravelled/WBM	<i>every year</i>	<i>once in three years</i>	<i>whenever required</i>
Black-topped	<i>every year</i>	<i>once in five years</i>	<i>whenever required</i>

Studies carried out in developing countries have shown that significant returns can be achieved from investments on rural road maintenance. Such internal rate of returns has been found varying from 17%, in case of regravelling, to as high as 74% in routine maintenance. Not only due to this fact but also with a view to protect its ever expanding rural road network, the Government has made its choice of investment on rural road maintenance.

The **aim of Maintenance Plan** is to ensure conducive funding arrangement among the stakeholders; to establish an effective and efficient management system under the jurisdiction of local governing institutions; and to define the overall regulatory mechanism for maintenance process. Such efforts made through the implementation of this maintenance plan are expected to produce one or more of the following effects:

- reduced transport prices and increased use of roads;
- increased farm gate prices of produce;
- increased agricultural production and cropping intensity;
- lower prices of agricultural inputs;
- enhanced management capability of local governing institutions on road maintenance; and
- better serviceability and increased safety and reliability for road users.

3.1 National Rural Road Inventory

Out of the total rural road length³ of 14,000 km, there are about 11,650 km of earthen roads, about 2,050 km of gravelled roads and about 300 km of black-topped roads in Nepal. However, about 32% of the earthen road length, i.e., about 3,700 km, is expected to be non-maintainable as they are required to be re-built as standard new roads (refer to **Table 3** for National Rural Road Inventory).

Table 3 : National Rural Road Inventory as of 1999

Type of Road	Maintainable (km)	Non-maintainable (km)	Total (km)
Earthen	7,950	3,700	11,650
Gravelled/WBM	2,050	0	2,050
Black-topped	300	0	300
Total (km)	10,300	3,700	14,000

This plan primarily deals with the maintenance aspects of 10,300 km of present maintainable roads. In due course of time, this length will be increased and thus, for

³ This data is based on the District Transport Master Plans-DTMPs and the District Rural Road Inventories (wherever available) as well as the data provided by the DDCs. This is also supplemented by the road statistics provided by the *Road Management & Finance Reform Implementation Committee*.

planning purpose, the annual increment of road length is assumed to be 5%. The rest of 3,700 km of present non-maintainable roads are required to be reconstructed properly in order to be eligible for maintenance investments. Therefore, the reconstruction of these roads will also be a part of the assumed 5% growth.

3.2 Physical targets on maintenance

Yearly requirement Vs. base target

Given the present level of management and absorption capacity at the local level, and the limited resources available at the centre, the Government has planned a manageable workload (about 25% of total maintenance requirement) as the first year's base target on maintenance. Accordingly, the Government has fixed the annual base targets so as to arrive at the full maintenance requirement (100%) over a period of eight years with an expectation that the national economy and the local management capacity will improve favourably as a result of proper management of road maintenance. **Table 4** provides the base targets against the actual maintenance requirements for the next eight years (from 1999/00 to 2006/07), covering the remaining period of Ninth Plan as well as the period of Tenth Plan.

Table 4 : Yearly Requirement Vs. Base Target

Year	Maintenance (km)							
	Earthen		Gravelled/WBM		Black-topped		Total	
	Reqd.*	Target	Reqd.*	Target	Reqd.*	Target	Reqd.*	Target
1999/00	7,950	2,000	2,050	500	300	75	10,300	2,575
2000/01	8,350	3,315	2,155	840	305	125	10,810	4,280
2001/02	8,770	4,630	2,265	1,185	320	170	11,355	5,985
2002/03	9,210	5,945	2,380	1,525	335	220	11,925	7,690
2003/04	9,670	7,260	2,500	1,870	350	265	12,520	9,395
2004/05	10,155	8,575	2,625	2,210	370	315	13,150	11,100
2005/06	10,665	9,890	2,755	2,550	390	360	13,810	12,800
2006/07	11,200	11,200	2,895	2,895	410	410	14,505	14,505

* 5% annual growth of network is assumed.

Physical targets for each type of maintenance

Prior to fixing the financial targets on maintenance, it is necessary to fix the individual target for each type of maintenance which is intended to be carried out in each year for each category of road (refer to **Table 5**). For routine maintenance, it is simply the same target as mentioned in **Table 4** while for periodic maintenance, it is fixed on the basis of frequency given in **Table 2 (b)**. In case of rehabilitation, the individual yearly target is fixed at 5% of the base target by assuming the life span of road as 20 years.

Table 5 : Physical Targets for each Type of Maintenance

Type of Road and Intervention	Yearly Target for each Type of Maintenance (km)							
	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07

Earthen								
Routine (100%)	2,000	3,315	4,630	5,945	7,260	8,575	9,890	11,200
Periodic (50%)	1,000	1,660	2,315	2,975	3,630	4,290	4,945	5,600
Rehabilitation(5%)	100	165	230	300	365	430	495	560
Gravelled/WBM								
Routine (100%)	500	840	1,185	1,525	1,870	2,210	2,550	2,895
Periodic (33%)	165	280	395	510	625	735	850	965
Rehabilitation(5%)	25	40	60	75	95	110	130	145
Black-topped								
Routine (100%)	75	125	170	220	265	315	360	410
Periodic (20%)	15	25	35	45	55	65	70	80
Rehabilitation(5%)	4	6	9	11	13	16	18	20

3.3 Financial targets on maintenance

Resource contribution on maintenance from different stakeholders

Nepal's rural population is the key beneficiary of the rural road network. As the VDCs and the DDCs are the first institutions to realise the impact of economic stimulation resulted by the effective operation of rural road network, their active participation in the road maintenance process should be an essential pre-condition for its success. In line with its policies in promoting local participation in the development process as well as in strengthening the decentralised local governance process, the Government has decided to involve the local governing institutions actively in funding the maintenance activities under this plan. As fixed by the Government, the level of resource contribution for each maintenance intervention is given in **Table 6**.

Table 6 : Resource Contribution

Type of Maintenance	DDC/VDC	HMGN
Routine Maintenance	50%	50%
Periodic Maintenance	33%	67%
Rehabilitation	25%	75%

Based on the proposed local contribution (counterpart funds) for each type of maintenance, the Government will provide the supplementary funds as an attempt to encourage local governing institutions for maintenance of their own networks. The total amount of the local counterpart funds and the respective allocations for each maintenance activity will indicate, (i) the prioritised maintenance needs of the district, (ii) the readiness and the commitment of the local government, and (iii) their desire to be partners in the development process. In the long run, such financial details could even be used as a yard stick to measure the improved local capacity for road maintenance.

Financial targets

The problems of ensuring adequate maintenance spending within a budgetary process are not new, nor are they unique to roads. As the present practice of allocating road grants has not resulted in a significantly greater proportion of total road spending on

planned maintenance (new construction is more favoured than maintenance), the Government will tie up the grant allocation mechanism with the local counterpart funds made available for a specific maintenance activity. By doing so, a larger and more certain spending on maintenance is guaranteed on the part of local governing institutions. The following financial targets (refer to **Table 7**) are fixed with reference to the physical targets given in **Table 5**.

Table 7 : Financial Targets for each Type of Maintenance

Type of Road and Intervention (Cost per km)	Yearly Target for each Type of Maintenance NRs '00000 (US\$ '000)							
	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Earthen								
Routine (NRs. 14,000) (US\$ 200)	280 (400)	464 ((663)	648 (926)	832 (1,189)	1,016 (1,452)	1,201 (1,715)	1,385 (1,978)	1,568 (2,240)
Periodic (NRs.100,000) (US\$ 1,500)	1,000 (1,500)	1,660 (2,490)	2,315 (3,473)	2,975 (4,463)	3,630 (5,445)	4,290 (6,435)	4,945 (7,418)	5,600 (8,400)
Rehab. (NRs.300,000) (US\$ 4,500)	300 (450)	495 (743)	690 (1,035)	900 (1,350)	1,095 (1,643)	1,290 (1,935)	1,485 (2,228)	1,680 (2,520)
Total	1,580 (2,350)	2,619 (3,896)	3,653 (5,434)	4,707 (7,002)	5,741 (8,540)	6,781 (10,085)	7,815 (11,624)	8,848 (13,160)
Gravelled/WBM								
Routine (NRs. 21,000) (US\$ 300)	105 (150)	176 (252)	249 (356)	320 (458)	393 (561)	464 (663)	536 (765)	608 (869)
Periodic (NRs.150,000) (US\$ 2,250)	248 (371)	420 (630)	593 (889)	765 (1,148)	938 (1,406)	1,103 (1,654)	1,275 (1,913)	1,448 (2,171)
Rehab. (NRs.600,000) (US\$ 9,000)	150 (225)	240 (360)	360 (540)	450 (675)	570 (855)	660 (990)	780 (1,170)	870 (1,305)
Total	503 (746)	836 (1,242)	1,202 (1,785)	1,535 (2,281)	1,901 (2,822)	2,227 (3,307)	2,591 (3,848)	2,926 (4,345)
Black-topped								
Routine (NRs. 42,000) (US\$ 600)	32 (45)	53 (75)	71 (102)	92 (132)	111 (159)	132 (189)	151 (216)	172 (246)
Periodic (NRs.300,000) (US\$ 4,500)	45 (68)	75 (113)	105 (158)	135 (203)	165 (248)	195 (293)	210 (315)	240 (360)
Rehab. (NRs.1,200,000) (US\$ 18,000)	48 (72)	72 (108)	108 (162)	132 (198)	156 (234)	192 (288)	216 (324)	240 (360)
Total	125 (185)	200 (296)	284 (422)	359 (533)	432 (641)	519 (770)	577 (855)	652 (966)
Total								
Routine	417 (595)	693 (990)	968 (1,384)	1,244 (1,779)	1,520 (2,172)	1,797 (2,567)	2,072 (2,959)	2,348 (3,355)
Periodic	1,293 (1,939)	2,155 (3,233)	3,013 (4,520)	3,875 (5,814)	4,733 (7,099)	5,588 (8,382)	6,430 (9,646)	7,288 (10,931)
Rehabilitation	498 (747)	807 (1,211)	1,158 (1,737)	1,482 (2,223)	1,821 (2,732)	2,142 (3,213)	2,481 (3,722)	2,790 (4,185)
Grand Total	2,208 (3,281)	3,655 (5,434)	5,139 (7,641)	6,601 (9,816)	8,074 (12,003)	9,527 (14,162)	10,983 (16,327)	12,426 (18,471)

Maintenance Plan

Table 8 provides the Maintenance Plan with details such as yearly physical and financial targets, the respective local (DDC/VDC) and HMGN contributions for each type of maintenance, etc.

Table 8
Rural Road Maintenance Plan

Type of Road and Intervention (Cost per km)	Annual Maintenance Plan for (All financial figures are in NRs. '00,000)									
	1999/00					2000/01				
	Target		Contribution			Target		Contribution		
	Physical (km)	Financial (NRs.)	Local (NRs.)	HMGN (NRs.)	Others (NRs.)	Physical (km)	Financial (NRs.)	Local (NRs.)	HMGN (NRs.)	Others (NRs.)
Earthen										
Routine (NRs. 14,000)	2,000	280	140.0	140.0		3,315	464	232.0	232.0	
Periodic (NRs.100,000)	1,000	1,000	330.0	670.0		1,660	1,660	547.8	1,112.2	
Rehab. (NRs.300,000)	100	300	75.0	225.0		165	495	123.8	371.3	
Total	3,100	1,580	545.0	1,035.0		5,140	2,619	903.6	1,715.5	
Gravelled/WBM										
Routine (NRs. 21,000)	500	105	52.5	52.5		8,401	176	88.0	88.0	
Periodic (NRs.150,000)	165	248	81.8	166.2		280	420	138.6	281.4	
Rehab. (NRs.600,000)	25	150	37.5	112.5		40	240	60.0	180.0	
Total	690	503	171.84	331.16		8,721	836	286.6	549.4	
Black-topped										
Routine (NRs. 42,000)	75	32	16.0	16.0		125	53	26.5	26.5	
Periodic (NRs.300,000)	15	45	14.9	30.2		25	75	24.8	50.3	
Rehab. (NRs.1,200,000)	4	48	12.0	36.0		6	72	18.0	54.0	
Total	94	125	42.85	82.15		156	200	69.25	130.75	
Total										
Routine (NRs. '00,000)	2,575	417	208.5	208.5		4,280	693	346.5	346.5	
(US\$ '000)	km	595	297.5	297.5		km	990	495.0	495.0	
Periodic (NRs. '00,000)	1,180	1,293	426.7	866.3		1,965	2,155	711.2	1,443.9	
(US\$ '000)	km	1,939	639.9	1,299.1		km	3,233	1,066.9	2,166.1	
Rehab. (NRs. '00,000)	129	498	124.5	373.5		211	807	201.8	605.3	
(US\$ '000)	km	747	186.8	560.3		km	1,211	302.8	908.3	
Grand (NRs. '00,000)	3,884	2,208	760	1,448		6,456	3,655	1259.4	2395.6	
Total (US\$ '000)	km	3,281	1,124.1	2,156.9		km	5,434	1864.6	3569.4	

Table 8
Rural Road Maintenance Plan

Type of Road and Intervention (Cost per km)	Annual Maintenance Plan for (All financial figures are in NRs. '00,000)			
	2001/02		2002/03	
	Target	Contribution	Target	Contribution

	Physical (km)	Financial (NRs.)	Local (NRs.)	HMGN (NRs.)	Others (NRs.)	Physical (km)	Financial (NRs.)	Local (NRs.)	HMGN (NRs.)	Others (NRs.)
Earthen										
Routine (NRs. 14,000)	4,630	648	324.0	324.0		5,945	832	416.0	416.0	
Periodic (NRs.100,000)	2,315	2,315	764.0	1,551.1		2,975	2,975	981.8	1,993.3	
Rehab. (NRs.300,000)	230	690	172.5	517.5		300	900	225.0	675.0	
Total	7,175	3,653	1,260.5	2,392.6		9,220	4,707	1,622.8	3,084.3	
Gravelled/WBM										
Routine (NRs. 21,000)	1,185	249	124.5	124.5		1,525	320	160.0	160.0	
Periodic (NRs.150,000)	395	593	195.7	397.3		510	765	252.5	512.6	
Rehab. (NRs.600,000)	60	360	90.0	270.0		75	450	112.5	337.5	
Total	1,640	1,202	410.19	791.81		2,110	1,535	524.95	1010.05	
Black-topped										
Routine (NRs. 42,000)	170	71	35.5	35.5		220	92	46.0	46.0	
Periodic (NRs.300,000)	35	105	34.7	70.4		45	135	44.6	90.5	
Rehab. (NRs.1,200,000)	9	108	27.0	81.0		11	132	33.0	99.0	
Total	214	284	97.15	186.85		276	359	123.55	235.45	
Total										
Routine (NRs. '00,000)	5,985	968	484.0	484.0		7,690	1,244	622.0	622.0	
(US\$ '000)	km	1,385	692.5	692.5		km	1,779	889.5	889.5	
Periodic (NRs. '00,000)	2,745	3,013	994.3	2,018.7		3,530	3,875	1,278.8	2,596.3	
(US\$ '000)	km	4,520	1,491.6	3,028.4		km	5,814	1,918.6	3,895.4	
Rehab. (NRs. '00,000)	299	1,158	289.5	868.5		386	1,482	370.5	1,111.5	
(US\$ '000)	km	1,737	434.3	1,302.8		km	2,223	555.8	1,667.3	
Grand (NRs. '00,000)	9,029	5,139	1,768	3,371		11,606	6,601	2271.3	4329.8	
Total (US\$ '000)	km	7,642	2,618	5,024		km	9,816	3,364	6,452	

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Table 8
Rural Road Maintenance Plan

Type of Road and Intervention (Cost per km)	Annual Maintenance Plan for (All financial figures are in NRs. '00,000)									
	2003/04					2004/05				
	Target		Contribution			Target		Contribution		
	Physical	Financial	Local	HMGN	Others	Physical	Financial	Local	HMGN	Others

	(km)	(NRs.)	(NRs.)	(NRs.)	(NRs.)	(km)	(NRs.)	(NRs.)	(NRs.)	(NRs.)
Earthen										
Routine (NRs. 14,000)	7,260	1,016	508.0	508.0		8,575	1,201	600.5	600.5	
Periodic (NRs.100,000)	3,630	3,630	1,197.9	2,432.1		4,290	4,290	1,415.7	2,874.3	
Rehab. (NRs.300,000)	365	1,095	273.8	821.3		430	1,290	322.5	967.5	
Total	11,255	5,741	1,979.7	3,761.4		13,295	6,781	2,338.7	4,442.3	
Gravelled/WBM										
Routine (NRs. 21,000)	1,870	393	196.5	196.5		2,210	464	232.0	232.0	
Periodic (NRs.150,000)	625	938	309.5	628.5		735	1,103	364.0	739.0	
Rehab. (NRs.600,000)	95	570	142.5	427.5		110	660	165.0	495.0	
Total	2,590	1,901	648.54	1252.46		3,055	2,227	760.99	1466.01	
Black-topped										
Routine (NRs. 42,000)	265	111	55.5	55.5		315	132	66.0	66.0	
Periodic (NRs.300,000)	55	165	54.5	110.6		65	195	64.4	130.7	
Rehab. (NRs.1,200,000)	13	156	39.0	117.0		16	192	48.0	144.0	
Total	333	432	148.95	283.05		396	519	178.35	340.65	
Total										
Routine (NRs. '00,000)	9,395	1,520	760.0	760.0		11,100	1,797	898.5	898.5	
(US\$ '000)	km	2,172	1,086.0	1,086.0		km	2,567	1,283.5	1,283.5	
Periodic (NRs. '00,000)	4,310	4,733	1,561.9	3,171.1		5,090	5,588	1,844.0	3,744.0	
(US\$ '000)	km	7,099	2,342.7	4,756.3		km	8,382	2,766.1	5,615.9	
Rehab. (NRs. '00,000)	473	1,821	455.3	1,365.8		556	2,142	535.5	1,606.5	
(US\$ '000)	km	2,732	683.0	2,049.0		km	3,213	803.3	2,409.8	
Grand (NRs. '00,000)	14,178	8,074	2,777	5,297		16,746	9,527	3278	6249	
Total (US\$ '000)	km	12,003	4,112	7,891		km	14,162	4,853	9,309	

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Table 8
Rural Road Maintenance Plan

Type of Road and Intervention (Cost per km)	Annual Maintenance Plan for (All financial figures are in NRs. '00,000)									
	2005/06					2006/07				
	Target		Contribution			Target		Contribution		
	Physical (km)	Financial (NRs.)	Local (NRs.)	HMGN (NRs.)	Others (NRs.)	Physical (km)	Financial (NRs.)	Local (NRs.)	HMGN (NRs.)	Others (NRs.)
Earthen										

Routine (NRs. 14,000)	9,890	1,385	692.5	692.5	11,200	1,568	784.0	784.0
Periodic (NRs.100,000)	4,945	4,945	1,631.9	3,313.2	5,600	5,600	1,848.0	3,752.0
Rehab. (NRs.300,000)	495	1,485	371.3	1,113.8	560	1,680	420.0	1,260.0
Total	15,330	7,815	2,695.6	5,119.4	17,360	8,848	3,052.0	5,796.0
Gravelled/WBM								
Routine (NRs. 21,000)	2,550	536	268.0	268.0	2,895	608	304.0	304.0
Periodic (NRs.150,000)	850	1,275	420.8	854.3	965	1,448	477.8	970.2
Rehab. (NRs.600,000)	130	780	195.0	585.0	145	870	217.5	652.5
Total	3,530	2,591	883.75	1707.25	4,005	2,926	999.34	1926.66
Black-topped								
Routine (NRs. 42,000)	360	151	75.5	75.5	410	172	86.0	86.0
Periodic (NRs.300,000)	70	210	69.3	140.7	80	240	79.2	160.8
Rehab. (NRs.1,200,000)	18	216	54.0	162.0	20	240	60.0	180.0
Total	448	577	198.8	378.2	510	652	225.2	426.8
Total								
Routine (NRs. '00,000)	12,800	2,072	1,036.0	1,036.0	14,505	2,348	1,174.0	1,174.0
(US\$ '000)	km	2,959	1,479.5	1,479.5	km	3,355	1,677.5	1,677.5
Periodic (NRs. '00,000)	5,865	6,430	2,121.9	4,308.1	6,645	7,288	2,405.0	4,883.0
(US\$ '000)	km	9,646	3,183.2	6,462.8	km	10,931	3,607.2	7,323.8
Rehab. (NRs. '00,000)	643	2,481	620.3	1,860.8	725	2,790	697.5	2,092.5
(US\$ '000)	km	3,722	930.5	2,791.5	km	4,185	1,046.3	3,138.8
Grand (NRs. '00,000)								
Total (US\$ '000)	19,308	10,983	3,778	7,205	21,875	12,426	4276.5	8149.5
	km	16,327	5,593	10,734	km	18,471	6,331	12,140

3.4 Resource mobilisation for maintenance

Total resources required

According to **Table 8**, the anticipated total resource requirement for the production of road maintenance is NRs. 220.8 million (about US\$ 3.28 million) in the fiscal year 1999/00 and it is expected to be increased up to NRs. 1,242.6 million (about US\$ 18.47 million) by the final fiscal year 2006/07. This excludes the funds requirement for institutional capacity building which will be fully financed by the Government.

Local resource mobilisation

As envisaged in the previous section, the concerned local governing institutions must arrange their share of contribution for the maintenance in order to be eligible for receiving proportionate supplementary funds from central Government. The local contribution may include resources generated by the DDC/VDC (*under the provisions made in Local Self-Governance Act 2055*), the funds contributed by the participating VDCs, the funds raised by the road beneficiaries, any other legal contributions made by other organisations (INGOs, NGOs, Transport Entrepreneurs, etc.) or individuals and block grants received from the central Government. These contributions should not account any commitment made in kind or free labour.

According to **Table 8**, the anticipated total local contribution is NRs. 76 million (about US\$ 1.12 million) in the fiscal year 1999/00 and will be increased up to NRs. 427.7 million (about US\$ 6.33 million) by the final fiscal year 2006/07. This constitutes about *thirty four percent* of total fund required for maintenance.

HMGN contribution

The Government may provide , on an average as its share of contribution up to *sixty six percent* of total fund required for all kinds of maintenance.

In addition to this allocation made available for road maintenance programme, the Government plans to provide additional funds for **institutional capacity building** at every level in order to perpetuate a well-institutionalised road maintenance at the districts. Such funds will be spent on logistic supports to DDCs, human resource development activities at all levels, technical resource bases such as quality control facilities, equipment maintenance facilities, etc., various consultancy services required for the design, supervision and management of maintenance works, and on the preparation/updating of Transport Master Plans (DTMP), technical documents and so on. These funds will, however, be provided by the Government for the initial eight years, i.e., the period covered by this plan. **Table 9** provides the details of total fund requirement for the implementation of this maintenance plan.

Table 9 : Total Fund Requirement

Activity	Fund Requirement NRs. '00000 (US\$ '000)							
	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
Road Maintenance (x)	2,208 (3,281)	3,655 (5,434)	5,139 (7,641)	6,601 (9,816)	8,074 (12,003)	9,527 (14,162)	10,983 (16,327)	12,426 (18,471)
Institutional Capacity Building (10% of x) - Logistic Support - Human Resource Develop. - Technical Resource Base - Consultancy services	221 (328)	366 (543)	514 (764)	660 (982)	808 (1,200)	953 (1,416)	1,098 (1,633)	1,243 (1,847)
Total Fund Required	2,429 (3,609)	4,021 (5,977)	5,653 (8,405)	7,261 (10,798)	8,882 (13,203)	10,480 (15,578)	12,081 (17,960)	13,669 (20,318)
Local Contribution	760 (1,124)	1,259 (1,865)	1,768 (2,618)	2,271 (3,364)	2,777 (4,112)	3,278 (4,853)	3,778 (5,593)	4,277 (6,331)

HMGN Contribution	1,669 (2,485)	2,762 (4,112)	3,885 (5,788)	4,990 (7,434)	6,105 (9,091)	7,202 (10,725)	8,303 (12,367)	9,393 (13,987)
- For programme	1,448 (2,157)	2,396 (3,569)	3,371 (5,024)	4,330 (6,452)	5,297 (7,891)	6,249 (9,309)	7,205 (10,734)	8,150 (12,140)
- For programme support (100% from HMGN)	221 (328)	366 (543)	514 (764)	660 (982)	808 (1,200)	953 (1,416)	1,098 (1,633)	1,243 (1,847)

Decisions concerning the use of resources made available for maintenance may be as important and as difficult as the task of raising the funds. Most problems that exist with road maintenance are institutional or managerial in origin, rather than technical. It is a known fact that all local governing institutions are not equally capable with regard to technical, financial and managerial aspects. Therefore, the institutional arrangements and funding mechanism set forth in this plan have been so devised that the local governing institutions will eventually become capable and feel responsible for the management of rural road maintenance.

4.1 Policy reforms related to institutional aspects

Ownership of rural roads

The Government has already decided that the responsibility of developing and maintaining the rural road network shall lie with the local governing institutions under the technical guidance and facilitation of newly established Department of Local Infrastructure Development and Agricultural Roads (DoLIDAR). As other government agencies such as DoR, DoI, etc. are still holding the responsibility of the development of a large portion of rural roads, there is a confusion over the responsibility prevailing both at the central and district levels. Therefore, prior to implementation of this maintenance plan, the ownership of all rural roads has to be handed over to the respective DDCs so that these DDCs can prepare and implement a comprehensive maintenance plan of rural roads within their jurisdiction.

Establishment of sectoral unit at district

Unlike the other technical departments, DoLIDAR does not have its technical office at the district level. The technical unit at DDC, presently staffed with the employees from the central Government, will likely be staffless once all central Government employees are withdrawn according to the newly enacted Local Self-Governance Act (2055). As per this Act, the DDCs could establish *Rural Road Units* by recruiting their own staff based on the Local Service Act which is yet to be formulated. Adding to this situation, not all DDCs may financially be able, in near future, to establish such a new unit by affording the remuneration and other fringe benefits of employees. Under these circumstances, it is very unlikely that these sectoral units will be established at all candidate districts. Therefore, for the candidate districts who cannot establish their sectoral units or who are not managerially capable, the DoLIDAR shall assist those DDCs in implementing the maintenance plan. This office will, however, be withdrawn once the respective DDCs become capable in managing the road maintenance work.

Technical manpower at districts

National Strategy for rural infrastructure Development has specified the number of technical personnel required for each category of districts. It envisages that these technicians shall be in place at the DDCs for effective implementation of the rural infrastructure programmes. The following **Table 10** gives the required number of technical staff in the districts as per the *National Strategy*. Therefore, staffing of DDCs' sectoral units with the adequate technical personnel shall be accomplished prior to implementation of this plan.

Table 10 : Projection of District Technical Staff for Next Ten Years' Period

District		Projection of District Technical Manpower (Number)											
		At the beginning in 2054/55 (1997/98)				Phase I by 2059/60 (2002/03)				Phase II by 2064/65 (2007/08)			
Class	No.	SDE	E	Overseer		SDE	E	Overseer		SDE	E	Overseer	
				District	Ilaka			District	Ilaka			District	Ilaka
A	26	-	26	104	81	15	52	104	81	26	52	104	81
B	32	-	32	96	-	-	32	96	121	-	32	96	121
C	17	-	17	34	-	-	17	34	-	-	17	34	50
TOTAL	75	-	75	234	81	15	101	234	202	26	101	234	252

SOURCE.....*National Strategy for Rural Infrastructure Development (1997)*

Note : Class 'A' districts - Jhapa, Morang, Sunsari, Saptari, Siraha, Dhanusa, Mahottari, Sarlahi, Bara, Rautahat, Nawalparasi, Rupandehi, Kapilbastu, Dang, Kailali (by Phase I) and Parsa, Chitwan, Banke, Bardiya, Kanchanpur, Syangja, Kaski, Tanahu, Kathmandu, Lalitpur, Kavrepalanchok (by Phase II)

Class 'B' districts - Taplejung, Panchthar, Ilam, Sankhuwasabha, Tehrathum, Dhankuta, Bhojpur, Khotang, Okhaldhunga, Udayapur, Dolakha, Ramechhap, Sindhuli, Dhading, Nuwakot, Sindhupalchok, Makwanpur, Gorkha, Lamjung, Baglung, Gulmi, Palpa, Rukum, Salyan, Rolpa, Pyuthan, Dailekh, Surkhet, Achham, Doti, Darchula, Baitadi

Class 'C' districts - Solukhumbu, Rasuwa, Bhaktapur, Manang, Mustang, Myagdi, Parbat, Arghakhanchi, Humla, Mugu, Dolpa, Jumla, Kalikot, Jajarkot, Bajhang, Bajura, Dadeldhura

SDE - Senior Divisional Engineer (Class II)
E - Engineer (Class III)

Annex III provides the district-wise staff requirements as specified in the *National Strategy*.

Institutional support from the centre

As described in previous sections, the task of road maintenance needs a wide range of managerial skills and demands a well co-ordinated approach amongst providers, producers, financiers and the users of the rural road. Considering the present capacity of the DDC, it is obvious that they, at least for sometime in future, require continued technical expertise and guidance from the centre in managing their road maintenance activities effectively. Adding to this, the DoLIDAR which was formed recently to provide such technical support to local bodies, too needs further strengthening in fulfilling its responsibility. To this end, the Government decides to seek external donor assistance, both at the local and central level, for the management of road maintenance.

4.2 Institutional Arrangements

The following institutional arrangements are envisaged at different levels for effective implementation of this plan.

At district level

The DDC (through its *Rural Road Unit*) will be the sole responsible agency for implementing all road maintenance activities at the district. The functions of DDC regarding the road maintenance are as follows:

- Prepare District Rural Road Inventory;
- Prepare District Transport Master Plan (DTMP) and get it approved by the District Council;
- Identification of links to be maintained;
- Prioritisation of such links with reasonable justifications;
- Preparation of Annual District Maintenance Programme (ADMP) which includes all designs and cost-estimates;
- Approval of ADMP by the DDC;
- Commitment and allocation of local counterpart funds for the programme;
- Submission of proposal (as per the specified format) for maintenance programme to central Government, requesting proportionate HMGN supplementary funds;
- Co-ordinate all stakeholders (VDCs, users committees, road beneficiaries, NGOs, CBOs, transport entrepreneurs, etc.) at district level for road maintenance;
- Resource mobilisation for road maintenance activities;
- Opening of the Bank Account for District Rural Road Maintenance Fund and its regular operation;
- Assignment of technical staff and defining their roles, responsibilities and power;
- Preparation of specifications, tender documents, Terms of Reference (ToR), etc.
- Procurement of goods and services for road maintenance;
- Taking measurements of work; preparing bills; and settlement of payments;
- Supervision and Monitoring of the implementation of ADMP;
- Reviewing, auditing and reporting on the implementation of ADMP;
- Enactment of regulations for the management and proper use of rural transport system;
- Operate and regulate the rural transport system.

At central level

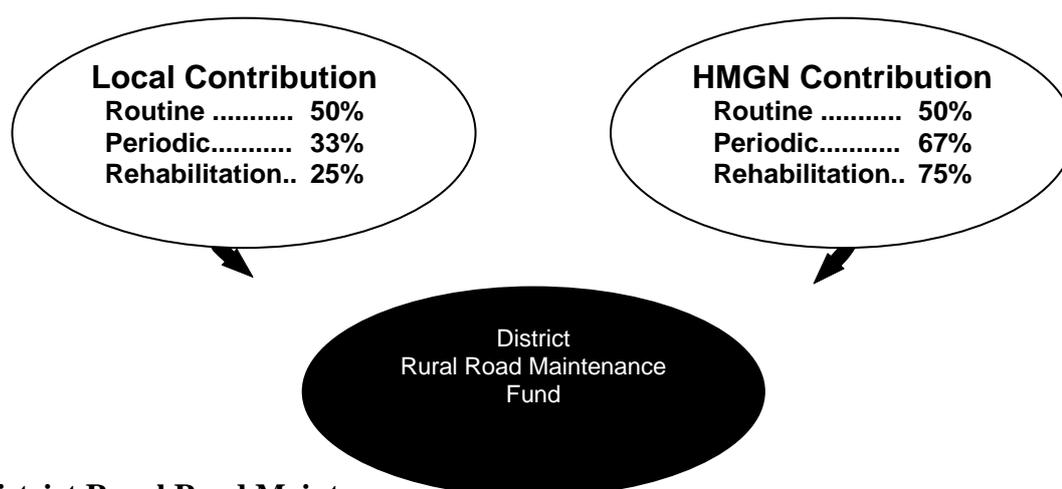
DoLIDAR will be the main co-ordinating agency for the implementation of the road maintenance programme throughout the country. The main functions of DoLIDAR regarding the road maintenance are as follows:

- Preparation of the Annual National Maintenance Programme (ANMP) by reviewing and accommodating the proposals submitted by the DDCs;
- Ensuring and release of adequate supplementary funds from the central Government;
- Monitoring and periodic review of the implementation of ANMP;
- Provision of technical and managerial support as and when required;

- Carrying out the periodic assessments on local institutional capabilities and arranging the logistic support and technical resource bases accordingly;
- Conducting training needs assessments for various target groups at local level and facilitating the organising of workshops, seminars and other training programmes accordingly;
- Arranging the study tours, regional and central level seminars and other training required for the implementation of ANMP;
- Assisting in formulating the Government policies and ensuring the exercise of such policy decisions.

4.3 Funding Mechanism

Since, implementation of road maintenance plan is a cost-sharing, decentralised, participatory process, the fund flow mechanism should be smooth and prompt for its success. Therefore, it is essential to establish a separate fund called **District Rural Road Maintenance Fund** at every programme district.



District Rural Road Maintenance Fund

The District Rural Road Maintenance Fund (DRRMF) mainly consists of local counterpart contribution and the proportionate HMGN supplementary allocations made available for the programme. The local counterpart contribution may consist of the resources generated by the DDCs/VDCs (*under the provisions made in Local Self-Governance Act 2055*), the funds contributed by the participating VDCs, the funds raised by the road beneficiaries, any other legal contributions made by the other organisations or individuals and block grants received from the central Government.

Upon the approval of the proposal for ADMP by the appropriate authorities, the local counterpart funds mobilised by the respective DDCs shall be credited to the Bank Account opened exclusively for the District Rural Road Maintenance Fund. Based on the amount credited, the Government will release its specified share of contribution (refer to page 11; **Table 6 : Resource Contribution**) from the programme allocation

to the respective DRRMF account. Prior to the release of HMGN funds, the candidate district should, however, become a programme district by fulfilling the following **Preparedness Criteria**.

Preparedness Criteria to become a programme district

In order to participate in this road maintenance programme, every candidate district should prove its readiness by fulfilling the criteria given below.

Every candidate district should,

- i. at least, prepare the District Rural Road Inventory;
- ii. commit to prepare the District Transport Master Plan within the first two years of its engagement with the programme;
- iii. prepare and approve its ADMP by the DDC, with details such as
 - identified links and their maintenance requirements;
 - prioritisation with reasonable justifications;
 - designs and cost-estimates of each road;
 - total fund requirements for each type of maintenance and respective share of local contribution;
 - brief description of *Rural Road Unit* with details on its staff;
 - description on available logistics and technical resource bases;
 - selected implementation modality (force account, local contracting, users' committee);
 - work plan;
 - etc.
- i. commit its share of contribution in cash and indicate its readiness to follow the specified guidelines provided by the Government.

Any candidate district who fulfils the above criteria may submit a proposal in the specified format (later to be provided by the DoLIDAR) to DoLIDAR by expressing its willingness to participate as a programme district of the road maintenance plan. If this proposal is acceptable to the Government, the district will become qualified for the programme.

Candidate districts for the programme

The Government has identified 58 candidate districts which have already got access to strategic road network. These districts may be eligible to become programme districts once they fulfil the **preparedness criteria** to show their readiness for participation. The list of candidate districts is given in **Table 11**.

Table 11 : Candidate Districts

EASTERN REGION	20. Dhading	<i>Dhaulagiri Zone</i>
<i>Mechi Zone</i>	21. Nuwakot	42. Parbat

01. Taplejung	22. Kathmandu	43. Baglung
02. Panchthar	23. Lalitpur	44. Myagdi
03. Ilam	24. Bhaktapur	MID WESTERN REGION
04. Jhapa	25. Kavrepalanchowk	<i>Rapti Zone</i>
<i>Koshi Zone</i>	<i>Narayani Zone</i>	45. Rolpa
05. Terathum	26. Makawanpur	46. Pyuthan
06. Dhankuta	27. Rautahat	47. Dang
07. Sunsari	28. Bara	48. Salyan
08. Morang	29. Parsa	<i>Bheri Zone</i>
<i>Sagarmatha Zone</i>	30. Chitwan	49. Banke
09. Udaypur	WESTERN REGION	50. Bardiya
10. Okhaldhunga	<i>Lumbini Zone</i>	51. Surkhet
11. Saptari	31. Nawalparasi	FAR WESTERN REGION
12. Siraha	32. Rupandehi	<i>Seti Zone</i>
CENTRAL REGION	33. Kapilvastu	52. Kailali
<i>Janakpur Zone</i>	34. Arghakhanchi	53. Doti
13. Dhanusha	35. Palpa	54. Achham
14. Mahottari	36. Gulmi	<i>Mahakali Zone</i>
15. Sarlahi	<i>Gandaki Zone</i>	55. Darchula
16. Sindhuli	37. Syangja	56. Baitadi
17. Dolakha	38. Tanahu	57. Dadeldhura
<i>Bagmati Zone</i>	39. Gorkha	58. Kanchanpur
18. Sindhupalchowk	40. Lamjung	
19. Rasuwa	41. Kaski	

How the road maintenance work is carried out, mainly depends upon (i) the implementation approach - whether centralised or decentralised, labour-based or equipment-based, etc. and (ii) the modality - whether direct employment of labour through force account system or involvement of users' groups through lengthman/labour gang system or contracting of local firms/individuals. These factors further outline the extent to which the public sector, private sector and the communities are involved in the road maintenance activities. This chapter describes the Government position on such issues, particularly with reference to its recent policies and strategies.

5.1 Implementation Approach

As stipulated in the *National Strategy for Rural Infrastructure Development (1997)*, all rural road maintenance works should be carried out by adopting the *labour-based, local resources-oriented, environment-friendly techniques* and in accordance with the *HMGN decentralised, participatory approach*. Adopting this approach in rural road maintenance will ensure the achievement of Government's prime goal of poverty alleviation by lowering the rural unemployment and supplementing the level of rural income.

5.2 Implementation Modalities

There are three distinct implementation modalities used in Nepal for rural road maintenance work. These modalities and their respective characteristics are discussed here so that each DDC (implementing agency) can choose the most appropriate option with reference to the situation (availability of local labour, material and equipment; interest of the local contractors for maintenance work; the degree of user involvement in development works; etc.) prevailed at the respective district.

Direct employment of labour through force account system

Under this modality, the implementing agency directly employs labour (either as permanent staff or as temporary basis) and uses this labour along with the agency's maintenance equipment to carry out maintenance activities. This is the most traditional modality being used in Nepal, particularly by the Department of Roads (DoR). Several factors have contributed to the frequent use of force account system. First, the bias toward equipment-based technology, common in the past, created a situation in which most contractors could not afford the necessary maintenance equipment. Second, it was often felt that alternative modalities such as contracting would lead to a lowering of maintenance standards.

These views have, however, changed dramatically in recent years with more and more agencies attempting to involve users' groups or to use contracting as the alternative modalities for road maintenance. As the force account system, a rather input-oriented system, offers no or little incentives to improve the efficiency, most of them now prefer to adopt the other alternative modalities. This modality may still be preferred for *emergency maintenance* against other alternatives as it is extremely difficult, by its nature, to plan for emergency work.

Involvement of users' groups through lengthman/labour gang system

Under the supervision of a DDC technician, a *lengthman* or a *labour gang* can be employed through the local road users' committee which is accountable to the public (local beneficiary community) regarding the operational condition of the road. The chosen lengthmen or labour gang, paid generally on task basis, live adjacent to the section of the road which is assigned to them. Since their road using neighbours know that they are being paid to maintain the road, additional pressures can be placed on them to carry out their tasks effectively. In this way they are likely to be more effective in comparison to the labourers working under the force accounts modality. Involving users in road maintenance (mainly for routine) may also take the form of labour contributions popularly known as "*Jana Sahabhagita*", particularly in districts where raising of local counterpart funds (cash) is difficult. This modality is more suitable for managing the routine maintenance work as, in most cases, locally available skills could well be sufficient to carry out such type of activities.

Contracting of local firms/individuals

Most road maintenance activities are simple and can be undertaken by small local contractors who tend to use labour rather than heavy equipment, and local resources rather than imported ones. Contracting of local firms and individuals can have additional advantages. As they have to compete each other to win the job, every firm tends to perform better in order to ensure or maintain the reputation of its work. This is more efficient and effective system to manage road maintenance as far as a conducive environment, which allows adequate resource management and promotes free and fair competition, can be guaranteed by the DDCs. The districts where the labour is scarce can opt for this modality as the local contracting firms and individuals could bring the labour from elsewhere. The DDCs who do not have enough technical manpower to supervise a large number of labour groups (appointed by users' groups or employed under the force account system) can choose this modality as it requires comparatively lesser technical staff from the part of DDC. This modality is more preferred for *periodic maintenance* and *rehabilitation*.

5.3 Implementation Matrix

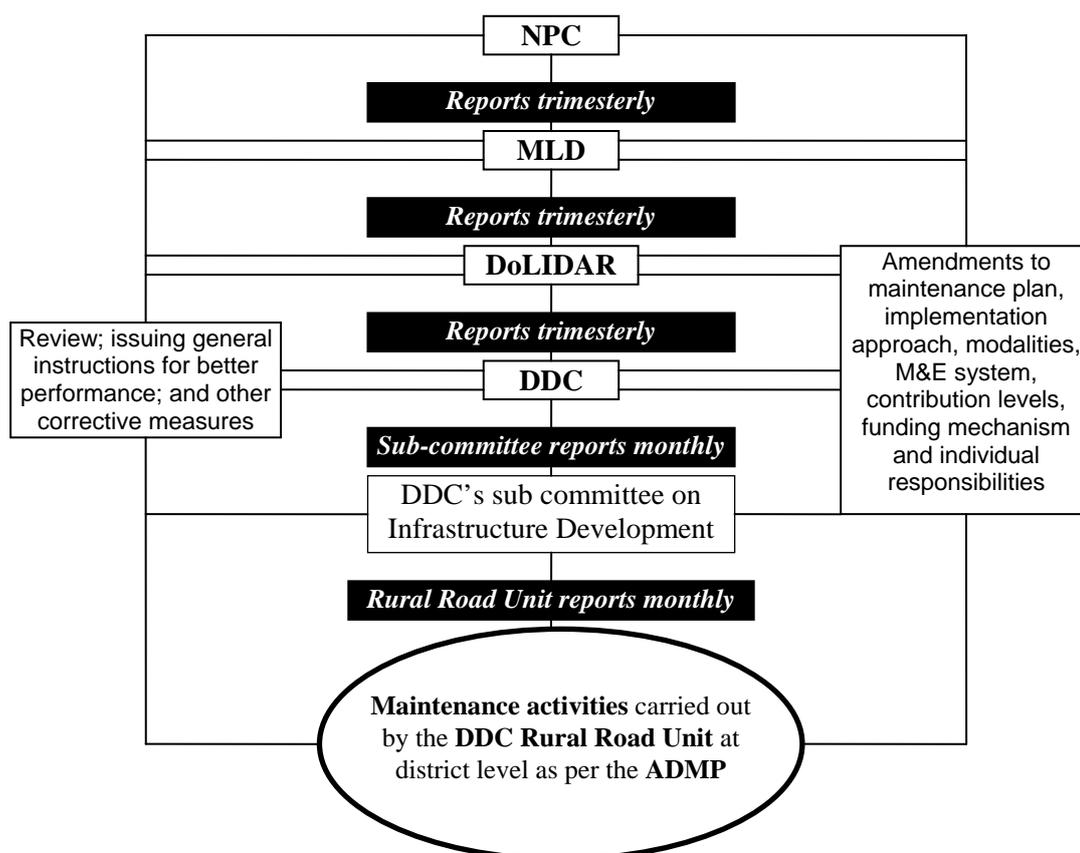
The following matrix given in **Table 12** describes various functions that each stakeholder (public sector, private sector or community level) should perform while implementing an effective system of road maintenance.

Table 12 : Implementation Matrix

S. No.	Function	Activities	Responsible Parties
1	PLANNING	<ul style="list-style-type: none"> Preparation of Rural Road Inventory Preparation of DTMP Identification of links against each maintenance intervention 	DDCs DDCs DDCs
2	PROGRAMMING AND PRIORITISATION	<ul style="list-style-type: none"> Prioritisation of links with justifications Preparation of ADMP including designs and cost-estimates Approval of ADMP Commitment and allocation of local counterpart funds Submission of proposal for maintenance programme Review and approval of the district proposals at centre Preparation of ANMP 	DDCs DDCs District Councils DDCs DDCs DoLIDAR/MLD/NPC DoLIDAR/MLD/NPC
3	REVENUE GENERATION AND FUNDING	<ul style="list-style-type: none"> Co-ordination among local stakeholders Local resource mobilisation Opening of the bank account for DRRMF Credit the local counterpart funds as per the approved plan 	DDCs DDCs DDCs DDCs
4	BUDGETING	<ul style="list-style-type: none"> Annual budget allocation Release of proportionate HMGN funds 	MLD DoLIDAR/MLD
5	PREPARATORY WORK	<ul style="list-style-type: none"> Preparation of specifications, tender documents, ToR, etc. Preparation of labour and material schedules Formation and registration of users' committees 	DDCs DDCs DDCs/NGOs
6	TENDERING	<ul style="list-style-type: none"> Bid notice Tender evaluation Procurement of goods and services 	DDCs DDCs DDCs
7	SITE TECHNICAL SUPERVISION	<ul style="list-style-type: none"> Assignment of technical staff Technical guidance and assistance Supervision/quality control of maintenance work Taking measurements Preparing bills 	DDCs DDCs DDCs DDCs DDCs
8	CONTRACT MANAGEMENT	<ul style="list-style-type: none"> Contract monitoring Payments Performance evaluation 	DDCs DDCs DDCs/DoLIDAR
9	MAINTENANCE WORK	<ul style="list-style-type: none"> Supply of materials, tools and equipment Equipment rental Carrying out of maintenance activities Dispute resolution/Mediation 	DDCs/Contractors Contractors/Suppliers Contractors/Labour Groups/Lengthmen Legal System/UGs
10	TRAINING	<ul style="list-style-type: none"> Conducting training needs assessments Conducting awareness campaigns for local leaders and users Conducting training for local contractors Conducting training for technicians Workshops, seminars and study tours 	DoLIDAR DDCs/DoLIDAR DoLIDAR DoLIDAR DoLIDAR
11	TECHNICAL AND MANAGERIAL SUPPORT	<ul style="list-style-type: none"> Provision of technical and managerial support to DDCs Assisting in formulating the policies and ensuring the exercise of such decisions Arranging logistic support, technical resource bases, technical assistance, etc. to DDCs 	DoLIDAR DoLIDAR DoLIDAR/MLD
12	MONITORING AND EVALUATION	<ul style="list-style-type: none"> Reviewing, auditing and reporting on the implementation of ADMP Monitoring and periodic review of ADMP Conducting periodic assessment on local institutional capabilities Performance evaluation studies 	DDCs DoLIDAR DoLIDAR/MLD/NPC DoLIDAR/MLD/NPC
13	REGULATING THE USE	<ul style="list-style-type: none"> Enactment of regulations for the management and proper use of rural transport system Operation and regulation of the rural transport network 	District Councils DDCs

5.4 Monitoring and Evaluation

Regular monitoring of the implementation of rural road maintenance plan is very important as it helps (i) to keep an eye on the progress of maintenance activities; (ii) to check whether the stipulated approach and modalities are being followed by the DDCs; (iii) to make periodic assessments on the built-up capacity of DDCs; and (iii) to identify the areas where further policy reforms are deemed necessary. The following flow chart describes the entire M&E mechanism suggested for this purpose.



The Government plans to perform two major reviews on the entire RRMP each at the end of Ninth and Tenth Plan. In the reviews to be performed in August 2002 and August 2007,

- the total length of rural road network will be re-assessed along with the number of new candidate districts. With the completion of many DTMPs, this exercise will compile the most realistic data base of the rural transport system;
- the performance of the DDCs and their Rural Road Units will be evaluated with reference to their increased workload, resources, capacities, etc. This will provide the basis for subsequent withdrawal of HMGN financial and technical assistance from the DDCs;

- the overall performance of the programme and its impact will be evaluated. The key effect monitoring indicators used for this purpose will be travel time, travel cost, length of roads in operation, level of local participation (both financially and socially), socio-economic benefits, etc.; and
- views and opinions of stakeholders regarding the implementation aspects of the programme and their contribution will be discussed on random sampling basis. Outcome of these discussions will be considered in determining the future course of action for the RRMP.

5.5 Options proposed for further decentralisation of maintenance work

Based on the outcome of these reviews, the ownership of certain rural roads (village roads and agricultural roads) may be handed over to further grass root level agencies such as VDCs, CBOs, NGOs, etc. Such action will promote and strengthen the decentralisation process from district to further down with clearly demarcated responsibility on regulation and maintenance of these roads.

Another option under the Government's consideration is privatising some of the rural roads which have a single principal user (or a user group with common interest) such as the owner of a sugar mill, a garment factory or a similar enterprise. Such users, however, should have a strong incentive to provide road maintenance and should anticipate that no agency would be interested to take care of these roads.

Ensuring the effective maintenance of rural roads in Nepal is not a simple task. As the existing rural road network is becoming so deteriorated, it is only with the massive infusions of new investment and improved maintenance efforts that the rural roads will be able to sustain economic development efforts. The roads can yield significant benefits to users and constitute one critical portion of the public infrastructure needed to support development. Despite the difficulties, problems and complexities prevailed in the sector, continuing maintenance activities in real terms is, therefore essential, particularly for the upliftment of rural economy and for the alleviation of poverty.

The maintenance plan further outlines an institutional arrangement which supports and strengthens the process of decentralisation. The framework proposed in this regard will ultimately enhance the capacities of local institutions thus making them feel responsible for the management of rural road maintenance. The plan spells out the implementation approach for road maintenance and highlights the options for implementing various maintenance interventions. The responsibility of monitoring the entire maintenance exercise lies mainly with the DoLIDAR, MLD and the NPC. Furthermore, the Government intends to perform two major reviews on the RRMP each at the end of Ninth and Tenth Plan. May it be a change in the proportions of contribution or a complete withdrawal of HMGN assistance from the district or a redefining of the implementation modality, these reviews will certainly help the Government in determining the future course of action for the maintenance of Nepal's rural road network.

COMPARATIVE DATA SHEET ON
Rural Road Network
(Earthen and Gravelled)

District		Area (sq.km)	*Population per sq.km.	Rural Road Length according to		
Code	Name			APP	Department of Road	**DDC
Eastern Region						
Mechi Zone						
1	Taplejung	3646	33	24	7	0
2	Panchthar	1241	141	131	57	77
3	Ilam	1703	135	141	133	254
4	Jhapa	1606	370	295	388	568
Koshi Zone						
5	Sankhuwasabha	3480	41	0	0	0
6	Tehrathum	679	152	10	2	36
7	Bhojpur	1507	132	0	0	0
8	Dhankuta	891	164	45	12	114
9	Sunsari	1257	369	103	115	260
10	Morang	1855	364	262	343	675
Sagarmatha Zone						
11	Solukhumbu	3312	29	0	0	0
12	Khotang	1591	136	0	0	0
13	Udaypur	2063	107	77	79	210
14	Okhaldhunga	1074	130	0	17	0
15	Saptari	1363	342	133	130	178
16	Siraha	1188	388	115	77	300
Central Region						
Janakpur Zone						
17	Dhanusha	1180	461	145	119	261
18	Mahottari	1002	439	215	162	387
19	Sarlahi	1259	391	128	121	345
20	Sindhuli	2491	70	54	32	101
21	Ramechhap	1546	122	0	0	0
22	Dolakha	2191	102	27	14	41
Bagmati Zone						
23	Sindhupalchowk	2542	96	87	37	149
24	Rasuwa	1544	169	108	63	4
25	Dhading	1926	19	47	42	158
26	Nuwakot	1121	248	61	133	250
27	Kathmandu	395	438	262	410	715
28	Lalitpur	385	668	132	257	245
29	Bhaktapur	119	5675	65	77	85
30	Kavrepalanchowk	1396	232	74	107	202
Narayani Zone						
31	Makawanpur	2426	171	125	109	182
32	Rautahat	1126	315	62	53	331
33	Bara	1190	313	99	81	979
34	Parsa	1353	306	9	99	184
35	Chitwan	2218	142	158	298	585
Western Region						
Lumbini Zone						
36	Nawalparasi	2162	109	68	68	300
37	Rupandehi	1360	133	102	138	920
38	Kapilvastu	1738	214	113	140	1243
39	Arghakhanchi	1193	438	68	70	359
40	Palpa	1373	194	112	115	96
41	Gulmi	1149	380	96	67	303
Gandaki Zone						

District		Area (sq.km)	*Population per sq.km.	Rural Road Length according to		
Code	Name			APP	Department of Road	**DDC
42	Syangja	1164	217	13	65	134
43	Tanahu	1546	173	94	78	270
44	Gorkha	3610	81	7	45	171
45	Manang	2246	130	0	0	0
46	Lamjung	1692	91	27	35	144
47	Kaski	2017	3	94	180	195
Dhaulagiri Zone						
48	Parbat	494	29	24	0	14
49	Baglung	1784	56	0	0	8
50	Myagdi	2297	101	0	0	4
51	Mustang	3573	40	0	0	0
Mid Western Region						
Karnali Zone						
52	Mugu	3535	7	0	0	0
53	Dolpa	7889	4	0	0	0
54	Humla	5655	6	0	0	0
55	Jumla	2531	30	0	0	0
56	Kalikot	1741	51	0	0	0
Rapti Zone						
57	Rukum	2877	54	0	0	0
58	Rolpa	1879	93	39	9	39 #
59	Pyuthan	1309	271	64	32	64 #
60	Dang	2955	62	186	40	530
61	Salyan	1462	123	46	16	110
Bheri Zone						
62	Banke	2337	49	56	103	230
63	Bardiya	2025	93	155	41	222
64	Surkhet	2451	92	110	23	142
65	Jajarkot	2230	130	0	0	0
66	Dailekh	1502	190	0	0	10
Far Western Region						
Seti Zone						
67	Kailali	3235	43	144	196	222
68	Doti	2025	45	50	25	68
69	Achham	1680	118	0	0	4
70	Bajura	2188	76	0	0	0
71	Bajhang	3422	122	0	0	0
Mahakali Zone						
72	Darchula	2322	44	0	0	0
73	Baitadi	1519	132	124	7	70
74	Dadeldhura	1538	68	166	48	50
75	Kanchanpur	1610	160	93	62	202
Total		147181	126	5245	5177	14000

..... Data is not available; Given figure is an estimation.

* Based on the 1991 Census of Central Bureau of Statistics, Nepal.

** Based on the Rural Road Inventory / DTMP or the data provided by the District Engineers.

BASIC DATA SHEET ON
Summary of District-wise Road Liabilities

District		Liabilities			Total
Code	Name	Long-run DoR	Currently by DoR	To be handled to concern authority	
Eastern Region					
Mechi Zone					
1	Taplejung	25	0	7	32
2	Panchthar	93	33	24	150
3	Ilam	139	56	77	272
4	Jhapa	146	136	252	534
Koshi Zone					
5	Sankhuwasabha	2	0	0	2
6	Tehrathum	30	0	2	32
7	Bhojpur	0	0	0	0
8	Dhankuta	96	7	5	108
9	Sunsari	176	66	49	291
10	Morang	152	204	139	495
Sagarmatha Zone					
11	Solukhumbu	0	0	0	0
12	Khotang	0	0	0	0
13	Udaypur	84	46	33	163
14	Okhaldhunga	17	17	0	34
15	Saptari	137	70	60	267
16	Siraha	101	56	21	178
Central Region					
Janakpur Zone					
17	Dhanusha	123	101	18	242
18	Mahottari	73	81	81	235
19	Sarlahi	100	27	94	221
20	Sindhuli	28	0	32	60
21	Ramechhap	0	0	0	0
22	Dolakha	104	12	2	118
Bagmati Zone					
23	Sindhupalchowk	137	0	37	174
24	Rasuwa	39	0	63	102
25	Dhading	113	6	36	155
26	Nuwakot	61	51	82	194
27	Kathmandu	118	319	91	528
28	Lalitpur	33	147	110	290
29	Bhaktapur	48	29	48	125
30	Kavrepalanchowk	62	25	82	169
Narayani Zone					
31	Makawanpur	217	30	79	326
32	Rautahat	70	32	21	123
33	Bara	90	64	17	171
34	Parsa	44	91	8	143
35	Chitwan	161	240	58	459
Western Region					
Lumbini Zone					
36	Nawalparasi	151	35	33	219
37	Rupandehi	100	91	47	238
38	Kapilvastu	143	134	6	283
39	Arghakhanchi	61	35	35	131
40	Palpa	95	12	103	210
41	Gulmi	45	28	39	112
Gandaki Zone					
42	Syangja	79	10	55	144
43	Tanahu	97	51	27	175
44	Gorkha	24	26	19	69

District		Liabilities			Total
Code	Name	Long-run DoR	Currently by DoR	To be handled to concern authority	
45	Manang	0	0	0	0
46	Lamjung	19	20	15	54
47	Kaski	84	159	21	264
Dhaulagiri Zone					
48	Parbat	24	0	0	24
49	Baglung	4	0	0	4
50	Myagdi	0	0	0	0
51	Mustang	0	0	0	0
Mid Western Region					
Karnali Zone					
52	Mugu	0	0	0	0
53	Dolpa	0	0	0	0
54	Humla	0	0	0	0
55	Jumla	0	0	0	0
56	Kalikot	0	0	0	0
Rapti Zone					
57	Rukum	0	0	0	0
58	Rolpa	39	2	7	48
59	Pyuthan	82	0	32	114
60	Dang	316	14	26	356
61	Salyan	112	0	16	128
Bheri Zone					
62	Banke	192	16	87	295
63	Bardiya	173	5	36	214
64	Surkhet	240	18	5	263
65	Jajarkot	0	0	0	0
66	Dailekh	60	0	0	60
Far Western Region					
Seti Zone					
67	Kailali	177	80	116	373
68	Doti	115	15	10	140
69	Achham	44	0	0	44
70	Bajura	0	0	0	0
71	Bajhang	5	0	0	5
Mahakali Zone					
72	Darchula	21	0	0	21
73	Baitadi	147	4	3	154
74	Dadeldhura	77	40	8	125
75	Kanchanpur	92	41	21	154
	Total	5637	2782	2395	10814

Department of Road's Liabilities = 5637 + 2782 = 8419

To be handed over to concerned authority = 2395

Source: Department of Roads, 1999

**Staff of
District Infrastructure and Agricultural Roads Section (DIARS)
in 2064/65**

(in accordance with National Strategy for Rural Infrastructure Development)

S. No.	District	Category	Whether the District is under the APP Programme?	Proposed Technical Staff at DIARS				
				SDE	Engineer	District Overseer	Ilaka Overseer	Total
Eastern Region								
<i>Mechi Zone</i>								
1	Taplejung	B	No	-	1	3	4	8
2	Panchthar	B	Yes	-	1	3	4	8
3	Ilam	B	Yes	-	1	3	4	8
4	Jhapa	A	Yes	1	2	4	3	10
<i>Koshi Zone</i>								
5	Sankhuwasabha	B	No	-	1	3	3	7
6	Tehrathum	B	Yes	-	1	3	3	7
7	Bhojpur	B	Yes	-	1	3	4	8
8	Dhankuta	B	Yes	-	1	3	3	7
9	Sunsari	A	Yes	1	2	4	3	10
10	Morang	A	Yes	1	2	4	3	10
<i>Sagarmatha Zone</i>								
11	Solukhumbu	C	No	-	1	2	3	6
12	Khotang	B	Yes	-	1	3	4	8
13	Udaypur	B	Yes	-	1	3	4	8
14	Okhaldhunga	B	Yes	-	1	3	4	8
15	Saptari	A	Yes	1	2	4	4	11
16	Siraha	A	Yes	1	2	4	4	11
Central Region								
<i>Janakpur Zone</i>								
17	Dhanusha	A	Yes	1	2	4	3	10
18	Mahottari	A	Yes	1	2	4	3	10
19	Sarlahi	A	Yes	1	2	4	4	11
20	Sindhuli	B	Yes	-	1	3	4	8
21	Ramechhap	B	Yes	-	1	3	4	8
22	Dolakha	B	No	-	1	3	4	8
<i>Bagmati Zone</i>								
23	Sindhupalchowk	B	No	-	1	3	4	8
24	Rasuwa	C	Yes	-	1	2	3	6
25	Dhading	B	Yes	-	1	3	4	8
26	Nuwakot	B	No	-	1	3	4	8
27	Kathmandu	A	Yes	1	2	4	3	10
28	Lalitpur	A	Yes	1	2	4	3	10
29	Bhaktapur	C	Yes	-	1	2	3	6
30	Kavrepalanchowk	A	Yes	1	2	4	3	10

S. No.	District	Category	Whether the District is under the APP Programme?	Proposed Technical Staff at DIARS				
				SDE	Engineer	District Overseer	Ilaka Overseer	Total
Narayani Zone								
31	Makawanpur	B	Yes	-	1	3	4	8
32	Rautahat	A	Yes	1	2	4	3	10
33	Bara	A	Yes	1	2	4	3	10
34	Parsa	A	Yes	1	2	4	3	10
35	Chitwan	A	Yes	1	2	4	3	10
Western Region								
Lumbini Zone								
36	Nawalparasi	A	Yes	1	2	4	3	10
37	Rupandehi	A	Yes	1	2	4	3	10
38	Kapilvastu	A	Yes	1	2	4	3	10
39	Argkhanchi	C	Yes	-	1	2	3	6
40	Palpa	B	Yes	-	1	3	4	8
41	Gulmi	B	Yes	-	1	3	4	8
Gandaki Zone								
42	Syangja	A	Yes	1	2	4	3	10
43	Tanahu	A	Yes	1	2	4	3	10
44	Gorkha	C	Yes	-	1	3	4	8
45	Manang	C	No	-	1	2	2	5
46	Lamjung	B	Yes	-	1	3	3	7
47	Kaski	A	Yes	1	2	4	3	10
Dhaulagiri Zone								
48	Parbat	C	Yes	-	1	2	3	6
49	Baglung	B	Yes	-	1	3	4	8
50	Myagdi	B	Yes	-	1	2	3	6
51	Mustang	C	No	-	1	2	2	5
Mid Western Region								
Karnali Zone								
52	Mugu	C	No	-	1	2	3	6
53	Dolpa	C	No	-	1	2	3	6
54	Humla	C	No	-	1	2	3	6
55	Jumla	C	No	-	1	2	3	6
56	Kalikot	C	No	-	1	2	3	6
Rapti Zone								
57	Rukum	B	Yes	-	1	3	4	8
58	Rolpa	B	Yes	-	1	3	4	8
59	Pyuthan	B	Yes	-	1	3	3	7
60	Dang	A	Yes	1	2	4	3	10
61	Salyan	B	No	-	1	3	4	8
Bheri Zone								
62	Banke	A	Yes	1	2	4	3	10
63	Bardiya	A	Yes	1	2	4	3	10
64	Surkhet	B	Yes	-	1	3	3	7
65	Jajarkot	C	Yes	-	1	2	3	6
66	Dailekh	B	Yes	-	1	3	4	8

S. No.	District	Category	Whether the District is under the APP Programme?	Proposed Technical Staff at DIARS				
				SDE	Engineer	District Overseer	Ilaka Overseer	Total
Far Western Region								
<i>Seti Zone</i>								
67	Kailali	A	Yes	1	2	4	3	10
68	Doti	B	Yes	-	1	3	4	8
69	Achham	B	Yes	-	1	3	4	8
70	Bajura	C	No	-	1	2	3	6
71	Bajhang	C	No	-	1	2	4	7
<i>Mahakali Zone</i>								
72	Darchula	B	No	-	1	3	3	7
73	Baitadi	B	Yes	-	1	3	4	8
74	Dadeldhura	C	Yes	-	1	2	3	6
75	Kanchanpur	A	Yes	1	2	4	3	10
Total				26	101	234	252	613

Maintenance

Maintenance of Rural Roads

District Code	District Name	Fund Allocated						Expenditure					
		FY 2053/54		FY 2054/55		FY 2055/56		FY 2053/54		FY 2054/55		FY 2055/56	
		Rs.'000	Length (km)	Rs.'000	Length (km)	Rs.'000	Length (km)	Rs.'000	Length (km)	Rs.'000	Length (km)	Rs.'000	Length (km)
19	Sindhuli	160	50										
44	Baglung												
8	Morang												
32	Parsa	343.4	3	709.3	10.6			344.5	3	665.2	10.06		
51	Palpa	1400	66	1000	56	300	45	1278	59	950	55	300	45
9	Sunsari	916.87	27	301.03	28			699.86	27	172.1	28		
33	Makwanpur	210	4	784	16	2541	30	200	4	758	16		
50	Nawalparasi	400	2	940	7	600		400	2	268			
28	Lalitpur							768	12.996	429	34.671		
45	Parbat												
40	Lamjung									401.44	4		
75	Kanchanpur												
6	Tehrathum	333.71	0.55	504.75	1.4								
65	Banke	272.1	2.5					272.1	2.5				
4	Jhapa	1300		1000	5	1000		937.5		225.05	2.68		
66	Bardiya	257.7	0.1					257.7	0.1				
30	Kavrepalanchok					5000	7					5000	7
3	Ilam	43						43					
20	Sarlahi	2733.75	9.84	2273.6	11.74			2733.75	9.84	2287.3	11.75		

Details of Rural Roads

Details of Rural Roads

District Code	District Name	Types of Raod					
		Earthen		Gravelled		Bitumin-Paved	
		Already Maintained (km)	To be Maintained (km)	Already Maintained (km)	To be Maintained (km)	Already Maintained (km)	To be Maintained (km)
19	Sindhuli	14.2	86.8				
44	Baglung	7	1				
8	Morang	110	374	35	118	96	
32	Parsa	17.2	25.5	6.46	8.8		
51	Palpa	45	51				
9	Sunsari	68.4	45.6	94.9	51.1	9.6	2.4
33	Makwanpur	104.1	37	31.11	9.26		
50	Nawalparasi		4.1	374	570.1	118	
28	Lalitpur						
45	Parbat						
40	Lamjung	55	70	19		74	70
75	Kanchanpur		65		136.6	50.5	
6	Tehrathum						
65	Banke	100	80	30	20		
4	Jhapa	60	335.5	50	122		
66	Bardiya	22	144	30	26		
30	Kavrepalancho	Total	193.7	5	3	11	
3	Ilam		253.6				
20	Sarlahi	58.38	166.2	81.66	38.63		

**DATA SHEET ON
THE EXISTING PATTERN OF RESOURCE ALLOCATION Vs. ENVISAGED FUTURE PATTERN OF RESOURCE ALLOCATION
ON ROAD MAINTENANCE**

District			No. of VDC	Area (sq.km)	*Population per sq.km.	** Existing Rural Road Length (km)	Minimum Funds Required for the maintenance of existing rural road network (Rs.'000)				Allocation of HMGN District Road Grant for the year (Rs.'000)			Allocation of District Road Maintenance Fund for 56/57 (Rs.'000)	
Code	Class	Name					Routine	Periodic	Rehab.	Total	53/54	54/55	55/56	***HMGN District Road Grant	DDC Compulsory Contribution (____ %)
Eastern Region															
Mechi Zone															
1		Taplejung	50	3646	33	0					1900	1900	1900		
2		Panchthar	41	1241	141	77					1900	1900	1900		
3		Ilam	48	1703	135	254					2000	2000	2000		
4		Jhapa	47	1606	370	568					4000	4000	4000		
Koshi Zone															
5		Sankhuwasabha	33	3480	41	0					1100	1100	1100		
6		Tehrathum	32	679	152	36					1000	1000	1000		
7		Bhojpur	63	1507	132	0					1000	1000	1900		
8		Dhankuta	35	891	164	114					1900	1900	4000		
9		Sunsari	49	1257	369	260					4000	4000	4000		
10		Morang	65	1855	364	675					4000	4000	1000		
Sagarmatha Zone															
11		Solukhumbu	34	3312	29	0					1000	1000	1000		
12		Khotang	76	1591	136	0					2000	2000	2000		
13		Udaypur	44	2063	107	210					2000	2000	1000		
14		Okhaldhunga	56	1074	130	0					1000	1000	2000		
15		Saptari	114	1363	342	178					3500	3500	3500		
16		Siraha	106	1188	388	300					3500	3500	3500		
Central Region															
Janakpur Zone															
17		Dhanusha	101	1180	461	261					3700	3700	3700		
18		Mahottari	76	1002	439						3500	3500	3500		
19		Sarlahi	99	1259	391	345					3500	3500	3500		
20		Sindhuli	53	2491	70	101					2000	2000	2000		
21		Ramechhap	55	1546	122						1500	1500	1500		
22		Dolakha	51	2191	102	41					1800	1800	1800		

District			No. of VDC	Area (sq.km)	*Population per sq.km.	** Existing Rural Road Length (km)	Minimum Funds Required for the maintenance of existing rural road network (Rs.'000)				Allocation of HMGN District Road Grant for the year (Rs.'000)			Allocation of District Road Maintenance Fund for 56/57 (Rs.'000)	
Code	Class	Name					Routine	Periodic	Rehab.	Total	53/54	54/55	55/56	***HMGN District Road Grant	DDC Compulsory Contribution (____%)
Bagmati Zone															
23		Sindhupalchowk	79	2542	96						2800	2800	2800		
24		Rasuwa	18	1544	169	4					1000	1000	1000		
25		Dhading	50	1926	19	158					2500	2500	2500		
26		Nuwakot	61	1121	248	250					2500	2500	2500		
27		Kathmandu	57	395	438						3500	3500	3500		
28		Lalitpur	41	385	668	245					2800	2800	2800		
29		Bhaktapur	16	119	5,675	85					1500	1500	1500		
30		Kavrepalanchowk	87	1396	232	202					3700	3700	3700		
Narayani Zone															
31		Makawanpur	43	2426	171	182					2700	2700	2700		
32		Rautahat	96	1126	315	331					3500	3500	3500		
33		Bara	98	1190	313	979					3200	3200	3200		
34		Parsa	82	1353	306	184					3200	3200	3200		
35		Chitwan	36	2218	142	585					3800	3800	3800		
Western Region															
Lumbini Zone															
36		Nawalparasi	73	2162	109	300					3300	3300	3300		
37		Rupandehi	69	1360	133	920					3500	3500	3500		
38		Kapilvastu	77	1738	214	1243					3000	3000	3000		
39		Arghakhanchi	42	1193	438	359					2500	2500	2500		
40		Palpa	65	1373	194	96					3500	3500	3500		
41		Gulmi	79	1149	380	303					3300	3300	3300		
Gandaki Zone															
42		Syangja	60	1164	217	134					3800	3800	3800		
43		Tanahu	46	1546	173	270					3700	3700	3700		
44		Gorkha	66	3610	81	171					3200	3200	3200		
45		Manang	12	2246	130	0					800	800	800		
46		Lamjung	61	1692	91	144					2500	2500	2500		
47		Kaski	43	2017	3	195					3400	3400	3400		
Dhaulagiri Zone															
48		Parbat	55	494	29	14					2000	2000	2000		
49		Baglung	59	1784	56	8					3500	3500	3500		
50		Myagdi	40	2297	101	4					2000	2000	2000		
51		Mustang	16	3573	40	0					1000	1000	1000		

District			No. of VDC	Area (sq.km)	*Population per sq.km.	** Existing Rural Road Length (km)	Minimum Funds Required for the maintenance of existing rural road network (Rs.'000)				Allocation of HMGN District Road Grant for the year (Rs.'000)			Allocation of District Road Maintenance Fund for 56/57 (Rs.'000)	
Code	Class	Name					Routine	Periodic	Rehab.	Total	53/54	54/55	55/56	***HMGN District Road Grant	DDC Compulsory Contribution (____%)
Mid Western Region															
Karnali Zone															
52		Mugu	24	3535	7	0					1000	1000	1000		
53		Dolpa	23	7889	4	0					1500	1500	1500		
54		Humla	27	5655	6	0					1000	1000	1000		
55		Jumla	30	2531	30	0					1200	1200	1200		
56		Kalikot	30	1741	51	0					1000	1000	1000		
Rapti Zone															
57		Rukum	43	2877	54	0					1900	1900	1900		
58		Rolpa	51	1879	93						1000	1000	1000		
59		Pyuthan	49	1309	271	44					1900	1900	1900		
60		Dang	39	2955	62	530					2700	2700	2700		
61		Salyan	47	1462	123	110					1900	1900	1900		
Bheri Zone															
62		Banke	46	2337	49	230					2700	2700	2700		
63		Bardiya	31	2025	93	222					2700	2700	2700		
64		Surkhet	50	2451	92	142					2000	2000	2000		
65		Jajarkot	30	2230	130						1000	1000	1000		
66		Dailekh	55	1502	190	10					2000	2000	2000		
Far Western Region															
Seti Zone															
67		Kailali	42	3235	43	222					3000	3000	3000		
68		Doti	50	2025	45	68					1900	1900	1900		
69		Achham	75	1680	118	4					2000	2000	2000		
70		Bajura	27	2188	76	0					1100	1100	1100		
71		Bajhang	47	3422	122	0					1200	1200	1200		
Mahakali Zone															
72		Darchula	41	2322	44	0					1500	1500	1500		
73		Baitadi	62	1519	132	70					2800	2800	2800		
74		Dadeldhura	20	1538	68	50					1900	1900	1900		
75		Kanchanpur	19	1610	160	202					1900	1900	1900		
			3913	147181	126	12690					176300	176300	176300		

*Based on the 1991 census of Central Bureau of Statistics

** Earthen and Gravel roads irrespective of being motorable during a part of the year (only class 'A' and 'B'); based on the DTMP or the data provided by the DDC Engineer

*** This allocation will be referred hereafter as "HMGN Contribution for District Road Maintenance"

BASIC DATA SHEET ON
Population, Rural Road Grant and Total DDC Grant Allocation

District		Area (sq.km)	Population	Allocation of HMGN Rural Road Grant for the year			Total Block Grant			Rural Road Grant as a percentage of Total Block Grant		
Code	Name			53/54	54/55	55/56	53/54	54/55	55/56	%	%	%
Eastern Region												
Mechi Zone												
1	Taplejung	3646	120053	1900	1900	1900	7916	8523	8533	24.00	22.29	22.27
2	Panchthar	1241	175206	1900	1900	1900	6841	7399	7409	27.77	25.68	25.64
3	Ilam	1703	229214	2000	2000	2000	7106	7582	7592	28.15	26.38	26.34
4	Jhapa	1606	593737	4000	4000	4000	8298	8835	8845	48.20	45.27	45.22
Koshi Zone												
5	Sankhuwasabha	3480	141903	1100	1100	1100	6455	6713	6723	17.04	16.39	16.36
6	Tehrathum	679	102870	1000	1000	1000	5704	6194	6204	17.53	16.14	16.12
7	Bhojpur	1507	198784	1000	1000	1000	7058	7764	7774	14.17	12.88	12.86
8	Dhankuta	891	146386	1900	1900	1900	6980	7269	7279	27.22	26.14	26.10
9	Sunsari	1257	463481	4000	4000	4000	8305	8875	8885	48.16	45.07	45.02
10	Morang	1855	674823	4000	4000	4000	8524	9465	9475	46.93	42.26	42.22
Sagarmatha Zone												
11	Solukhumbu	3312	97200	1000	1000	1000	5986	6443	6453	16.71	15.52	15.50
12	Khotang	1591	215965	2000	2000	2000	8497	9169	9179	23.54	21.81	21.79
13	Udaypur	2063	221256	2000	2000	2000	7022	7522	7532	28.48	26.59	26.55
14	Okhaldhunga	1074	139457	1000	1000	1000	6477	7204	7214	15.44	13.88	13.86
15	Saptari	1363	465668	3500	3500	3500	10068	10865	10889	34.76	32.21	32.14
16	Siraha	1188	460746	3500	3500	3500	9964	10740	10750	35.13	32.59	32.56
Central Region												
Janakpur Zone												
17	Dhanusha	1180	543672	3700	3700	3700	10109	10540	10550	36.60	35.10	35.07
18	Mahottari	1002	440146	3500	3500	3500	8814	9345	9609	39.71	37.45	36.42
19	Sarlahi	1259	492798	3500	3500	3500	9535	10315	10325	36.71	33.93	33.90
20	Sindhuli	2491	223900	2000	2000	2000	7386	7920	7940	27.08	25.25	25.19
21	Ramechhap	1546	188064	1500	1500	1500	6792	7734	7744	22.08	19.39	19.37
22	Dolakha	2191	173236	1800	1800	1800	7481	8049	8059	24.06	22.36	22.34
Bagmati Zone												
23	Sindhupalchowk	2542	261025	2800	2800	2800	8917	10136	10146	31.40	27.62	27.60
24	Rasuwa	1544	36744	1000	1000	1000	5073	5373	5383	19.71	18.61	18.58
25	Dhading	1926	278068	2500	2500	2500	7609	8329	8339	32.86	30.02	29.98
26	Nuwakot	1121	245260	2500	2500	2500	8109	8530	8540	30.83	29.31	29.27
27	Kathmandu	395	675341	3500	3500	3500	8228	9065	9074.6	42.54	38.61	38.57
28	Lalitpur	385	257086	2800	2800	2800	7072	7527	7537	39.59	37.20	37.15
29	Bhaktapur	119	172952	1500	1500	1500	5048	5340	5350	29.71	28.09	28.04
30	Kavrepalanchowk	1396	324329	3700	3700	3700	10517	11167	11177	35.18	33.13	33.10
Narayani Zone												
31	Makawanpur	2426	314599	2700	2700	2700	7796	8542	8552	34.63	31.61	31.57
32	Rautahat	1126	414005	3500	3500	3500	9425	10617	10627	37.14	32.97	32.93
33	Bara	1190	415718	3200	3200	3200	9174	10407	10417	34.88	30.75	30.72
34	Parsa	1353	372524	3200	3200	3200	8669	9697	9707	36.91	33.00	32.97
35	Chitwan	2218	354488	3800	3800	3800	7797	8407	8416.6	48.74	45.20	45.15
Western Region												
Lumbini Zone												
36	Nawalparasi	2162	436217	3300	3300	3300	8580	9684	9851	38.46	34.08	33.50
37	Rupandehi	1360	522150	3500	3500	3500	8558	9429	9439	40.90	37.12	37.08
38	Kapilvastu	1738	371778	3000	3000	3000	8226	9282	9291.6	36.47	32.32	32.29
39	Arghakhanchi	1193	180884	2500	2500	2500	7392	8051	8061	33.82	31.05	31.01
40	Palpa	1373	236313	3500	3500	3500	9857	10099	10109	35.51	34.66	34.62
41	Gulmi	1149	266331	3300	3300	3300	9539	10763	10773	34.59	30.66	30.63
Gandaki Zone												

District		Area (sq.km)	Population	Allocation of HMGN Rural Road Grant for the year			Total Block Grant			Rural Road Grant as a percentage of Total Block Grant		
Code	Name			53/54	54/55	55/56	53/54	54/55	55/56	%	%	%
42	Syangja	1164	293526	3800	3800	3800	9751	10439	10500	38.97	36.40	36.19
43	Tanahu	1546	268073	3700	3700	3700	8921	9422	9432	41.48	39.27	39.23
44	Gorkha	3610	252524	3200	3200	3200	8866	10032	10042	36.09	31.90	31.87
45	Manang	2246	5363	800	800	800	4675	4880	5190	17.11	16.39	15.41
46	Lamjung	1692	153697	2500	2500	2500	8501	9288	9298	29.41	26.92	26.89
47	Kaski	2017	292945	3400	3400	3400	8024	8749	9034	42.37	38.86	37.64
Dhaulagiri Zone												
48	Parbat	494	143547	2000	2000	2000	7290	8049	8059	27.43	24.85	24.82
49	Baglung	1784	232486	3500	3500	3500	9772	10637	10647	35.82	32.90	32.87
50	Myagdi	2297	100552	2000	2000	2000	7123	7479	7489	28.08	26.74	26.71
51	Mustang	3573	14292	1000	1000	1000	5277	5544	5793	18.95	18.04	17.26
Mid Western Region												
Karnali Zone												
52	Mugu	3535	36364	1000	1000	1000	6424	7064	7478	15.57	14.16	13.37
53	Dolpa	7889	25013	1500	1500	1500	6932	7454	7785	21.64	20.12	19.27
54	Humla	5655	34383	1000	1000	1000	7064	7249	7654	14.16	13.80	13.07
55	Jumla	2531	75964	1200	1200	1200	6577	6700	6710	18.25	17.91	17.88
56	Kalikot	1741	88805	1000	1000	1000	6945	7160	8145	14.40	13.97	12.28
Rapti Zone												
57	Rukum	2877	155554	1900	1900	1900	7020	7969	7979	27.07	23.84	23.81
58	Rolpa	1879	179621	1000	1000	1000	6435	7244	7254	15.54	13.80	13.79
59	Pyuthan	1309	175469	1900	1900	1900	6794	7678	7688	27.97	24.75	24.71
60	Dang	2955	354413	2700	2700	2700	6733	7482	7492	40.10	36.09	36.04
61	Salyan	1462	181785	1900	1900	1900	6677	7688	7698	28.46	24.71	24.68
Bheri Zone												
62	Banke	2337	285604	2700	2700	2700	6947	7804	7813.6	38.87	34.60	34.56
63	Bardiya	2025	290313	2700	2700	2700	7195	7573	7583	37.53	35.65	35.61
64	Surkhet	2451	225768	2000	2000	2000	7259	7993	8003	27.55	25.02	24.99
65	Jajarkot	2230	113958	1000	1000	1000	6082	6589	6599	16.44	15.18	15.15
66	Dailekh	1502	187400	2000	2000	2000	8000	9039	9049	25.00	22.13	22.10
Far Western Region												
Seti Zone												
67	Kailali	3235	417891	3000	3000	3000	7517	7956	8298.6	39.91	37.71	36.15
68	Doti	2025	167168	1900	1900	1900	7852	8544	8554	24.20	22.24	22.21
69	Achham	1680	198188	2000	2000	2000	8990	10067	10077	22.25	19.87	19.85
70	Bajura	2188	92010	1100	1100	1100	6564	6844	7529	16.76	16.07	14.61
71	Bajhang	3422	139092	1200	1200	1200	7178	8344	8354	16.72	14.38	14.36
Mahakali Zone												
72	Darchula	2322	101683	1500	1500	1500	7099	8097	8107	21.13	18.53	18.50
73	Baitadi	1519	200716	2800	2800	2800	9291	10452	10462	30.14	26.79	26.76
74	Dadeldhura	1538	104647	1900	1900	1900	6503	6999	7009	29.22	27.15	27.11
75	Kanchanpur	1610	257906	1900	1900	1900	5520	5734	5744	34.42	33.14	33.08
Total		147181	18491097	176300	176300	176300	574702	625152	630303	30.68	28.20	27.97