

# **ANNEXES**

**ANNEX 2**

**FIRST FIELD SURVEY**

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### **A2.1 Introduction**

Study Team implemented the field survey to broadly collect data on the road maintenance capacity in areas visited and in this regard:

- 1) Determine who is responsible for maintenance of particular classes of roads and the classes, length, pavement type and general condition of their network.
- 2) Establish the resources available to enable them to execute their role.
- 3) Examine their plans and programs, funding and achievements.
- 4) Determine the constraints that impact on the implementation of road maintenance programs.
- 5) Examine the new proposals made through the KRB for road maintenance.

### **A2.2 Selection of Sample Districts**

Kenya has a total of 70 administrative districts in 8 provinces. For the survey it was decided that owing to the time constraint and similarities in various districts, only representative districts would be visited. The criteria for the selection of the districts was determined to be as follows:

- 1) Population
- 2) Density of Road Network
- 3) Terrain
- 4) Climate
- 5) Administrative Importance

Based on the criteria of administrative importance, all the provincial headquarters of districts were included in the survey.

The districts selected based on the above criteria are in Table A2.1.

**Table A2.1 Selected Districts**

Coast Province	Mombasa, Kilifi, Taita-Taveta
Eastern Province	Embu, Isiolo, Machakos, Meru Central
Central Province	Nyeri, Muranga, Nyandarua
Nairobi Province	Nairobi
North Eastern Province	Garissa
Rift Valley Province	Nakuru, Baringo, Kericho, Narok, Turkana
Western Province	Kakamega, Busia
Nyanza Province	Kisumu, Kisii, Migori

The justification for each district selected in Table A2.2.

**Table A2.2 Criteria for Selection of the Districts**

Mombasa	<ul style="list-style-type: none"> <li>• Provincial Headquarters,</li> <li>• Municipality</li> <li>• Extensive road network</li> <li>• Densely populated</li> <li>• All the above are unique features</li> </ul>
Kilifi	<ul style="list-style-type: none"> <li>• Typical coastal district</li> <li>• Relatively flat terrain</li> <li>• Medium population density</li> <li>• Medium road density, including various categories</li> </ul>
Taita-Taveta	<ul style="list-style-type: none"> <li>• Combines both very hilly and flat terrain</li> <li>• Does not border the ocean as in the other districts</li> <li>• Relatively wet in the high land and dry in the low areas</li> <li>• Has a long section of main arterial road Mombasa – Nairobi, A109</li> </ul>
Isiolo	<ul style="list-style-type: none"> <li>• Dry and flat terrain</li> <li>• Low traffic volume, low population, low road density which is typical of northern districts in this province.</li> </ul>
Machakos	<ul style="list-style-type: none"> <li>• Densely populated</li> <li>• Extensive road network</li> <li>• Combines both flat and hilly terrain</li> <li>• Relatively well developed infrastructure</li> </ul>
Meru Central	<ul style="list-style-type: none"> <li>• Wet and hilly terrain typical of central Eastern province districts</li> <li>• Meru town which is relatively developed is within the district</li> <li>• Densely populated</li> </ul>
Embu	<ul style="list-style-type: none"> <li>• Provincial headquarters</li> <li>• Municipality within district</li> <li>• Rich agricultural district</li> <li>• Rolling and hilly terrain</li> </ul>
Murang'a	<ul style="list-style-type: none"> <li>• Representative district in climate, terrain, population, road network, traffic vol. for Central Province districts except Nyandarua</li> </ul>
Nyeri	<ul style="list-style-type: none"> <li>• Provincial headquarters</li> <li>• Municipality within district</li> <li>• Rich agricultural district</li> <li>• Rolling and hilly terrain</li> </ul>
Nyandarua	<ul style="list-style-type: none"> <li>• Relatively under- developed network</li> <li>• Wet with rolling terrain</li> <li>• Rich agricultural district</li> </ul>
Nairobi	<ul style="list-style-type: none"> <li>• Capital</li> <li>• Provincial headquarters</li> <li>• High population, road density traffic</li> <li>• Peculiar problems</li> </ul>
Garissa	<ul style="list-style-type: none"> <li>• Provincial headquarters</li> <li>• Municipality within district</li> <li>• Dry-semi desert climate, flat terrain, low traffic vol. and road density and difficult terrain representative</li> </ul>

Narok	<ul style="list-style-type: none"> <li>• Combines both flat and hilly terrain, Vast area occupied by wildlife</li> <li>• Medium population density, low traffic volume</li> <li>• Typical of ASAL such Samburu, Laikipia, Wpokot districts in the RVP</li> </ul>
Nakuru	<ul style="list-style-type: none"> <li>• Provincial headquarters</li> <li>• Municipality within district</li> <li>• Rich agricultural district with high population density.</li> <li>• Rolling and hilly terrain</li> </ul>
Kericho	<ul style="list-style-type: none"> <li>• Typical wet, rich agricultural district in RVP</li> <li>• Hilly and rolling terrain</li> <li>• High population density</li> </ul>
Turkana	<ul style="list-style-type: none"> <li>• Very dry, sparsely populated, low traffic, low road density. Unique in many respects.</li> <li>• Not easily accessible</li> </ul>
Kakamega	<ul style="list-style-type: none"> <li>• Provincial headquarters</li> <li>• Municipality within district</li> <li>• Rich agricultural district with high population density.</li> <li>• Very wet with the only tropical rain forest. Rolling and flat terrain</li> </ul>
Busia	<ul style="list-style-type: none"> <li>• Relatively dry district in the province</li> <li>• Main road to Uganda passes through the district</li> <li>• Relatively low population density</li> </ul>
Kisii	<ul style="list-style-type: none"> <li>• Densely populated</li> <li>• Hilly terrain and relatively wet</li> <li>• Houses the ministries training school</li> </ul>
Kisumu	<ul style="list-style-type: none"> <li>• Provincial headquarters</li> <li>• Municipality within district</li> <li>• Rich agricultural district with high population density.</li> <li>• Wet and bordering lake Victoria and flat terrain</li> </ul>
Migori	<ul style="list-style-type: none"> <li>• Relatively dry district in the Nyanza Province</li> <li>• Relatively low population and under developed infrastructure.</li> </ul>

The following offices were selected for visit by the Study Team:

- 1) All provincial headquarters of the Ministry of Roads and Public Works (MORPW).  
The Provincial Works Office(r) (PWO) was interviewed.
- 2) All selected MORPW districts. The District Works Office(r) (DWO)/District Roads Engineer (DRE) was interviewed.
- 3) Municipalities at the towns in the provincial headquarters and county council offices in the other districts. Nairobi City Council.
- 4) Forest offices at Nyeri, Meru, Kericho and Kakamega
- 5) National parks and reserves at Nakuru, Aberdares, Tsavo East and Masai Mara.
- 6) Chemilil, Sony and Mumias sugar factories.
- 7) Kenya Wildlife Services (KWS), Forest Department and Kenya Institute of Highways and Building Technologies (KIHBT) headquarters in Nairobi.

### **A2.3 Data Collection**

Data for the survey was obtained through interviews with the officers visited and provided. The officers were requested to respond to the following issues on road maintenance.

- 1) Institutional setup at their level
- 2) Funds availed
- 3) Capacity to undertake works
- 4) Force account activities
- 5) Involvement of the private sector
- 6) Involvement of international donors
- 7) Proposal for KRB involvement
- 8) Training
- 9) Current road condition

Administrative Map of Kenya is shown in Figure A2.1.



Figure A2.1 Administrative Map of Kenya



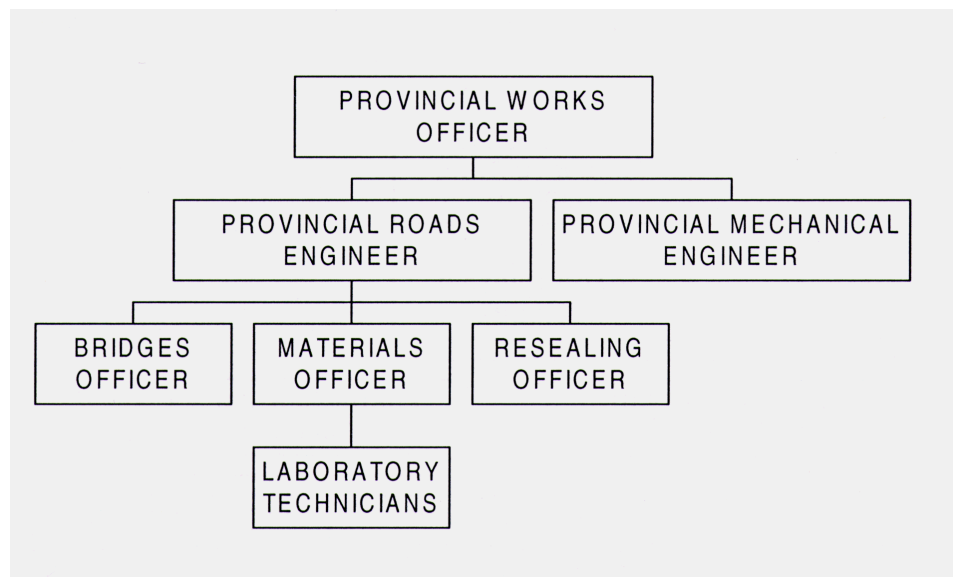
## A2.4 Study Result

### (1) Structure of Road Maintenance Organizations

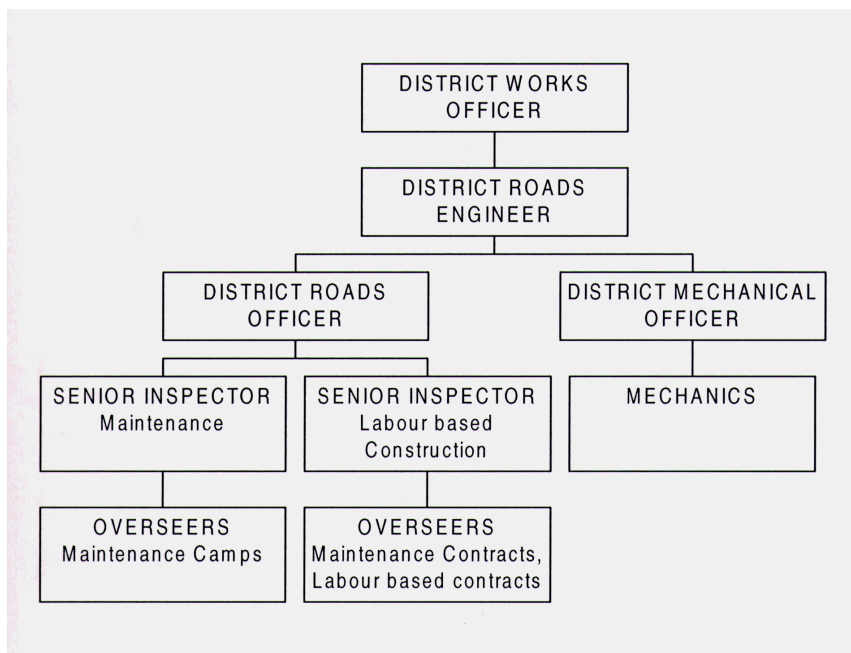
Road maintenance activities are carried out by Government departments and in most cases the structures are replicated from one district to the other. The structures for private companies such as Sony sugar are slightly different. The following RMO structures were identified:

- MORPW Province and District structures
- KWS Park and HQ structures
- Forest Department structures
- County Councils structures
- Municipal council structures
- Urban councils structures

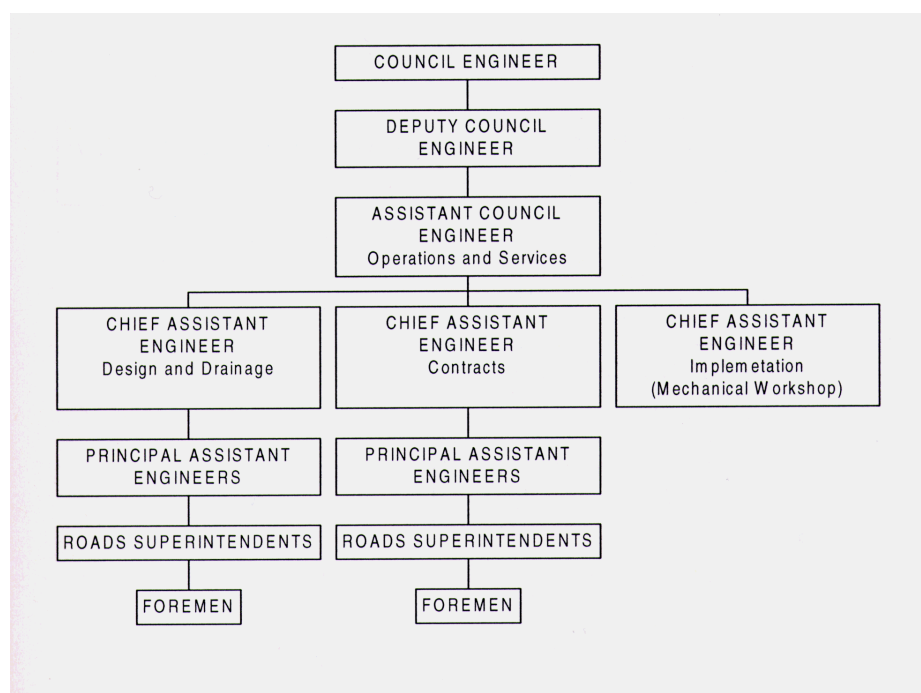
The organization structures are shown in Figure A2.2 to A2.8.



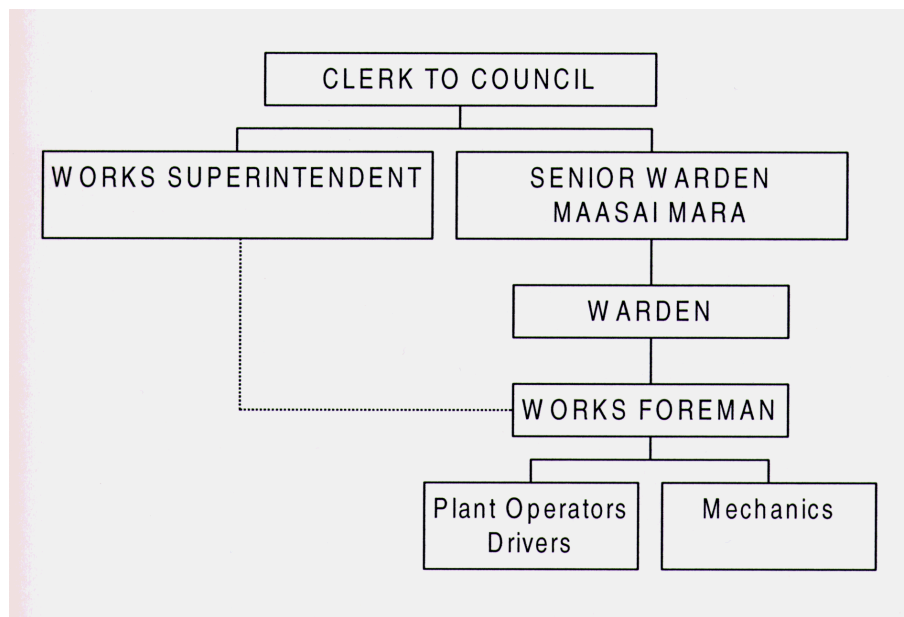
**Figure A2.2 Organization Chart for Provincial Works Office**



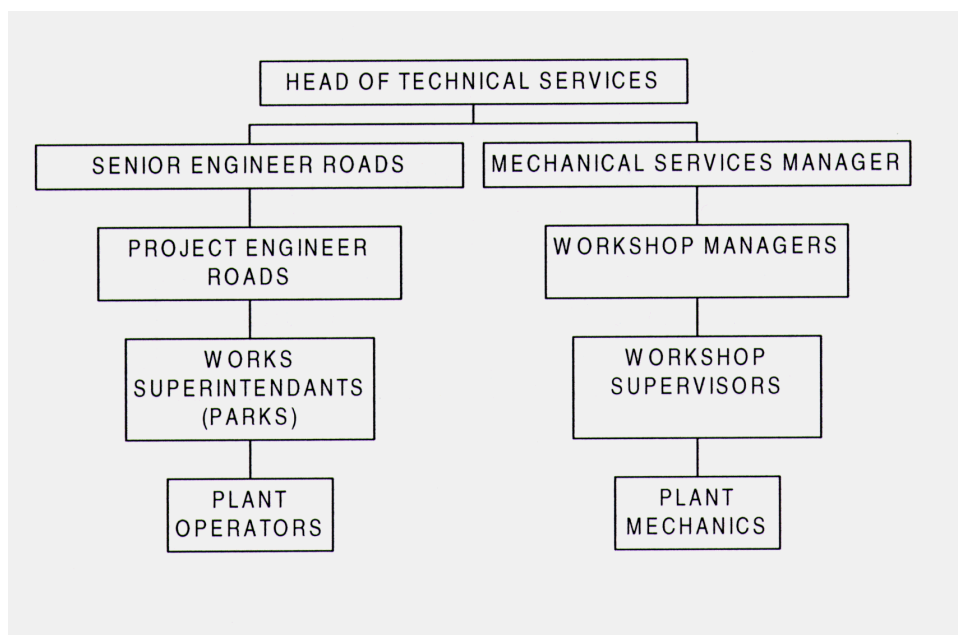
**Figure A2.3 Organization Chart for District Works Office**



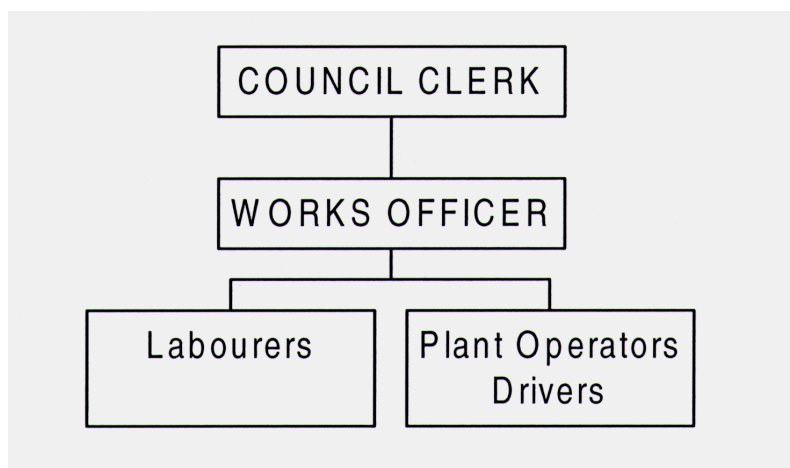
**Figure A2.4 Organization Chart for Municipal, Town and Urban Council**



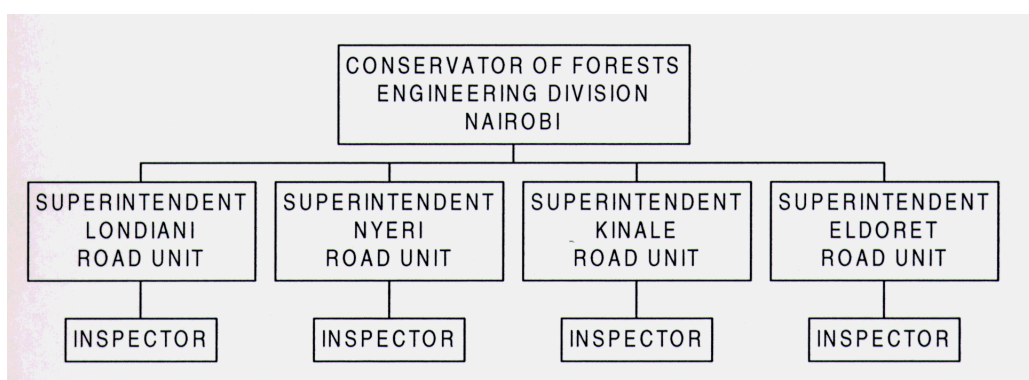
**Figure A2.5 Organization Chart for Masai Mara Game Reserve**



**Figure A2.6 Organization Chart for KWS Technical Services (Road Maintenance)**



**Figure A2.7 Organization Chart for County Council**



**Figure A2.8 Organization Chart for Forest Department**

**(2) Personnel**

From the data obtained and discussions held it was noted that:

- There are many vacant technical positions particularly in Council establishments. This we understood is due to excessive political interference and poor remuneration which renders the jobs unattractive to professional/technical personnel.
- In some Councils e.g. Gusii County Council the road maintenance operations are managed by Administrative officials who are not technically by trained.
- The MORPW RMO are well manned with qualified staff. In some cases there appears to be a duplication of roles e.g. where the DWO and DRE are both Road Engineers. The work load at the district level it appears, may not require the presence of two Engineers.
- The district operations, particularly repair of plant and equipment has been affected by the recent retirement of mechanics as part of the retrenchment exercise in the Civil Service.

- Training will be necessary in contract management and other relevant subjects to equip Engineers and other technical staff in the MORPW and Councils with the skills necessary to manage contracted works.

### **(3) Status of Equipment**

All the organisations responsible for road maintenance have a pool of equipment to enable them carry out works on a force account basis. The equipment includes heavy plant such as dozers and graders and vehicles. The organisations also have workshops for maintenance of the equipment.

During the field survey we were informed that maintenance of equipment is carried out by their own mechanics and through outside garages. The following was also noted:

- Within the MORPW i.e. DWOs and PWOs most of the equipment is in a poor state of maintenance. The officers informed us that this is due to inadequacy of funds.
- Most of the equipment is very old and in some cases beyond its economic life but due to lack of renewals the officers continue to maintain them an exercise which is very expensive in the long run.
- The MORPW has retired most of its mechanics in the field and there is fear that maintenance of equipment will suffer particularly in remote districts where services for repair of plant is not readily available in the private sector.
- The DWOs also informed us that the ministry is in the process of commercializing the Mechanical Department which means that the department will in future hire out and maintain equipment a method that seems attractive in the long run. In the short run the officers expect problems. The Roads Maintenance Units will be required to budget for equipment hire and maintenance.

### **(4) Funding**

It was difficult to obtain accurate data on funding available to districts and Councils for road maintenance. This was mainly due to the reluctance by some officers to give the information or lack of proper documentation. Generally it was noted that the funding available to the maintenance units is between 10% and 30 % of their annual requirement. The source of funds is as follows:

DWO, PWO	:	Fuel Levy Fund Recurrent budget Donor support
Town Councils	:	Local Authorities Transfer Fund Local Authorities taxes and levies Fuel Levy Fund
Forest Department	:	Recurrent budget Donor support in the past
County Councils	:	Local Authorities Transfer Fund Local Authorities taxes, crop cess and levies Fuel Levy Fund
Kenya Wildlife Service	:	Gate collection and other park related incomes Tranche from MORPW for maintenance of classified roads
Sugar companies	:	Internally generated revenue and crop cess Tranche from MORPW for maintenance of classified roads

## **(5) Responsibility for Execution of Road Maintenance Work**

### **1) Classified Roads**

Maintenance of the 63,000km classified road network falls under the MORPW. Responsibility falls under the Chief Engineer Roads who in turn has delegated his authority and responsibility to PWOs and DWOs to manage roadworks in their provinces and districts respectively. The network maintained by the MORPW is well defined and indicated in their road maps. Our observation however is that road inventory data is unavailable or not up to date.

## **2) County Council Roads (Unclassified Roads)**

The County Councils are in theory responsible for all unclassified roads that are outside the urban areas. The scope of their responsibility is not clearly defined and we were not able to obtain accurate information and maps on the network maintained by the County Councils. The decision on roads to be maintained/opened seems to be based on level of influence of the Councillor involved. The responsibility of maintenance of roads falls under a Works Superintendent who in turn reports to the Clerk to the Council. Only one of the County Councils visited had an Engineer responsible for road maintenance.

There is an urgent need for identification and mapping of roads falling under the Councils. This will hopefully be taken up by the KRB.

## **3) Urban Town Council Roads**

This category includes roads falling under the Town and other Urban Councils. The establishment for road maintenance is defined in most of the Councils visited. The maintenance units were headed by Engineers or had an establishment for one.

The Councils are responsible for maintenance of roads falling within their administrative boundaries. In most cases we were able to obtain good data on their road network but maps were not readily available. We were informed that the Ministry of Local Governments has embarked on an exercise to map roads under Kenya Urban Transport Infrastructure Project, KUTIP.

## **4) Sugar Roads**

The Sugar companies visited who have taken up the responsibility for maintenance of roads in their operational areas include Mumias, Chemelil, and Sony Sugar companies.

Amongst these companies, only Sony has a road maintenance contract with the MORPW which enables them to receive funds to maintain agreed roads within their areas. Mumias and Chemelil have established a working relationship with the DWO in the districts in which they operate in to enable them to share resources. No specific amounts are budgeted for them by the MORPW and hence they have to commit funds where necessary from their company incomes.

It would seem reasonable in future for the KRB to consider retaining the maintenance contract with Sony and to encourage a similar arrangement with the other companies as their performance is good.

## **5) Forest Roads**

The net work of roads maintained by the Forest Department is presented in Table 3. They are responsible for the maintenance of approximately 6800 km of roads within the forests. Currently 4 road maintenance units are in operation. These are based at Londiani, Eldoret, Kinale and Nyeri. The units are responsible for maintenance of roads in the forests in their geographical areas. A list of the forests for which each unit is responsible is presented in the Questionnaire for Karura Forest Station and in the organogram for Forest Department.

The equipment for the units is generally old and in a poor state of repair.

Funding is a problem and it was observed that though the department is in a position to generate revenue for its activities including road maintenance, the Government Financial procedures do not allow for this.

Funding for maintenance of forest roads has not been identified exclusively by the KRB and it is assumed that this will be channelled through the relevant DRC.

## **6) KWS (National Parks/Reserves) Roads**

Kenya Wildlife Service, KWS is responsible for approximately 7,100km of roads in Parks and Reserves that they manage and for maintenance of 1800 km of classified access and internal roads under an annual grant from the MORPW.

The organisation has a fully fledged Technical Department which is responsible for road maintenance. Other than for major upgrading works, maintenance works are carried out by units based in the Parks.

Generally the roads inspected are in a reasonable condition some of which (Nakuru, Aberdares, Tsavo East ) having been upgraded in the past three years under a Donor funded project, PAWS.



## 7) Roads in Masai Mara National Reserve

Masai Mara Reserve is managed independent of KWS except for joint security operations. It is owned by both Transmara and Narok County Councils. Their road network is about 370km.

The reserve has a road maintenance unit. The unit is managed by a Senior Warden assisted by a road Foreman. Its equipment is old and in a poor state of repair.

From the inspection, it was noted that the unit is unable to cope particularly with the major repair works that currently require their attention. In addition their annual funding of Ksh.4 m is inadequate to maintain the busy internal roads. The access roads which are classified are in a poor state of repair.

KRB has not identified the Reserve as one of their agencies and it is assumed that they will fall under the DRCs for Narok and Transmara. The Reserve has the capacity to generate sufficient funds to maintain its network however sources of funds for reconstruction of washed out sections will need to be identified.

### (6) Work Programs and Proposed Plan

The Programs presented during the visits were in most cases incomplete. This can be attributed to the short notice given and to poor record keeping. It was therefore not possible to carry out a detailed analysis. We can however state that in almost all the stations visited, annual work programs are prepared but these are not followed strictly due to, amongst other reasons:

- mid stream changes in budgets resulting in cuts and disruption,
- lack of back up resources such as equipment to execute works and
- long procurement process.

Though short term plans have been made in some of the stations visited, based on their past experience, Officers interviewed were not confident that they will be implementation. Those plans that were presented have been captured in the Questionnaire.

The Officers were also requested to present their **vision** of their road network and the following general comments were received:

- Gravel all earth roads to achieve an all weather motorability in the network

- Re-classify some of the classified roads and classify the unclassified roads
- Better trained and motivated (better paid) staff to man the road maintenance Units
- Contract out a large portion of the maintenance of roads
- Cut down on vehicle operating cost by reducing journey time for trucks hauling sugar cane. This will be achieved by construction of additional bridges.
- Increased funding for road maintenance

### **(7) Participation of the Private Sector**

Participation of the private sector was noted in all stations visited. This included Suppliers, Length men, and Road maintenance Contractors.

From the information received, the largest involvement is by Suppliers. Both the Councils, KWS and DWOs have lists of suppliers for road construction material and road equipment spares.

In districts where the Road 2000 project and other Labour based methods have been introduced, the Length men system is known and used appropriately. However though the system was praised as effective and for involvement of the stakeholders in the villages, its widespread use has been hampered by shortage of funding and prioritization. In areas where donor funding has stopped such as Kericho, the DRO informed us that little of the system is applied. Kericho was a pilot district for Road 2000.

The Length men system is not used in Councils, Parks and Reserves.

Gravelling Contractors and Periodic Maintenance Contractors are engaged by both the MORPW and Councils to carry out the upgrading and regravelling of unpaved roads and the patching and resealing/recarpeting of paved roads. The level of involvement is dependant on the funding available.

We were informed that there has been an increase of small scale/petty contractors who would be available to execute routine maintenance and patching and spot repair contracts. The increase is attributed to training offered by KIHBT and retired technical officers from MORPW who are positioning themselves to become petty contractors.

Generally the Officers informed us that the quality of work carried out by the Contractors is in most cases satisfactory but they would like to see increased training for the Contractors and

for themselves.

The participation of Sugar Companies in road maintenance though confined to their areas of operation is also a private sector participation.

The Officers would also like to retain a force account ability to enable them to deal expeditiously with emergencies.

### **(8) Training**

Training and re-training of staff in road maintenance was considered as important. Amongst areas that should be considered are management, supervision, contract administration and project management.

The teams were informed that MORPW has a fully fledged training facility based in Nairobi and Kisii. The Kisii Training Center has been specialising in Labour based maintenance methods and offers a number of courses to both local and International students.

Training for staff in Councils is relatively limited compared with MORPW.

### **(9) General Condition of the Road Network**

It is very difficult to give an overall opinion of the condition of roads in the whole country based on the limited inspection carried out on a few roads during this study. Our views are therefore based on comments made by the Officers we interviewed about their network.

Generally it was observed that the road network is in a poor condition. It was also observed that:

- There are ongoing road maintenance works in stations visited funded by Fuel Levy Fund and Local Authorities Transfer Fund. The works are however limited considering the state of the roads
- Some towns visited have had or will have some of their roads rehabilitated under the KUTIP or El Nino Emergency Projects. Some of these are; Meru, Nyeri, Embu, Nakuru, Kericho, Voi, Murang'a, Kisumu and Mombasa.
- Maintenance of township roads is a problem though the KUTIP and El Nino Projects have improved the situation in some of towns. A more comprehensive approach to maintenance will be required to maintain existing and recently rehabilitated roads.

- Main arterial roads such as Nairobi- Mombasa A109, Nairobi-Nakuru A104, Maai Mahiu –Narok and Amala river- Sotik, B3 have sections that are in a very poor state though repair teams were found working.
- Some gravel roads are gradually reverting to earth roads
- Maintenance of drainage facilities has been neglected and as a result culverts and bridges have been washed away by recent rains rendering sections of gravel and earth roads impassable. Examples of this were found in Masai Mara Reserve, Narok, Kericho, Nakuru, Turkana and are captured in the photographs.
- The Road 2000 initiative has commenced in districts such as Machakos and Meru but its impact has yet to be felt.
- Damage caused by the El Nino rains and recent rains has not been repaired in some districts such as Murang'a. We were informed that funds are not available for the works.

The condition of the roads is of major concern to the Officers though they reported that are handicapped by lack of funds and other resources.

#### **(10)Comments on the Role of the KRB and DRCs**

The establishment falling under the MORPW i.e. PWO and DWO are reasonably well informed about the proposed mode of operation once the KRB becomes fully operational. However, the Councils and other organisations we learnt have not been fully informed of their status under the proposed new arrangement.

The comments are summarized as follows;

- PWOs and DWOs welcome the new proposals as it will result in road maintenance funds being more equitably distributed. The KRB proposes to set aside Ksh.5m for each Parliamentary constituency and 24% of it's annual budget for maintenance of D, E, and other lower class special purpose roads. These funds will go to the districts
- The responsibility and authority for road maintenance will now be with the DRE unlike in the past where the District Commissioners usurped this role resulting in loss of control by the DWOs
- Funding levels for operations will be increased
- The presence of Politicians in the District Road Committees is bound to polarize road maintenance activities
- The matter of equipment hire and maintenance requires to be addressed early to avoid delay in implementation of works
- DWOs feel that they should retain some minimal equipment for force account activities

during emergencies

- Though the funding to be availed by KRB is for maintenance, consideration should be made on the need to identify funds to rehabilitate roads that are in a very poor state to a maintainable standard
- Some Town Councils felt that they ought to have been considered as Agencies of KRB. This is worth considering particularly considering activities of Municipalities such as Nairobi and the existing political/administrative structures are unlikely to change in the near future
- Town Engineer feel that they too should have been included in the DRCs. Inclusion of the County Council Chairmen and Mayors is not sufficient. They also object to the dominance of the DREs who are officers of the MORPW.