THE REPUBLIC OF UGANDA

District Road Works

VOLUME

1

Planning Manuals

Manual C:

Rehabilitation and Maintenance Planning System (RAMPS)

Ministry of Works, Housing and Communications

JUNE 2002

ACKNOWLEDGEMENTS

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Volume 1 Manual C

Rehabilitation and Maintenance Planning System (RAMPS)

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General Information

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General Information

General Information

PREAMBLE

Undertaking the Annual District Road Inventory and Condition Survey (ADRICS) results in the accumulation of a significant amount of data; refer Volume 1, Manual B - ADRICS.

To facilitate the management of this data and the subsequent selection and prioritisation of district road works, a computer software package called Rehabilitation And Maintenance Planning System (RAMPS) has been developed to assist District Local Government Engineering staff to make rational decisions regarding the development and maintenance of their road networks.

PURPOSE OF THE RAMPS

RAMPS has been developed to facilitate effective planning of rehabilitation and maintenance works on District Roads, and possibly at some later date for community access roads (CARs), throughout Uganda.

RAMPS is an updated and expanded data management system and planning tool based on the Routine Maintenance Planning System (ROMAPS) introduced in 27 districts during implementation of the African Development Bank supported district road component of the Ugandan Road Transport Project (URTP), which commenced in 1997.

RAMPS has been designed for use at the District level and takes into account current methods of data collection during the ADRICS. Standard formats for data collection, similar to those used for ROMAPS but with some modifications, have been adopted for use by the Local Government District Engineers (DLGEs), to record all necessary information with data entry requirements simplified to the extent possible; refer Volume 1, Manual B - ADRICS, Section B 4.

Linkages between RAMPS and any future GIS based multi-sector district planning system, such as the Integrated Rural Accessibility Planning (IRAP) methodology, have been included to allow for electronic digitisation and production of detailed mapping information on district and sub-county basis.

Future upgrades of the RAMPS will also include provisions for assisting the DLGEs in preparation of their Quarterly Progress Reports (QPRs); refer Volume 3, Manual B.

PRINCIPAL ELEMENTS OF RAMPS

The four principal elements of RAMPS include -

a) **Planning**; determination of prioritised district road rehabilitation and maintenance needs including global costs of all interventions,

b) **Programming**; based on actual fund availability, determination of final priorities, selection and timing of operations/activities, etc.,

c) **Implementation**; based on choice of implementation technology, work scheduling and allocation of resources, and

d) **Monitoring & Reporting**; assessing performance in terms of output, quality and costs of works enabling the updating of global costing and other data and preparation of QPRs.

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Section C2
The RAMPS Procedure and
Resources Required to Use the RAMPS

The RAMPS Procedure

The procedure for undertaking RAMPS is detailed in the Users Manual; Section 2 below.

RESOURCES REQUIRED TO USE THE RAMPS

The resources required to use the RAMPS include a suitable computer and accessories -

Technical Specification : Computers and Accessories

Sl. No.	Description and Specification Required	Remarks
1.	**Personal Computer :** a. Processor : Intel Pentium-III b. Processor Speed (MHz) : 600 c. Bus Speed (MHz) : 100 d. CPU Upgradable : Yes e. Multi-Processor Supported : Yes f. Flash BIOS : 2 MB Flash memory for system BIOS. Setup plug & play with company Logo. g. RAM (MB) : 128 (ECC) h. Maximum RAM Supported : 1 GB i. Hard Drive (GB) : 40 MB j. Hard Drive Controller Type : IDE k. Floppy Drive(s) Installed : 1.44 MB l. Number of USB Port : 2 m. Video Memory Installed : 8 MB (AGP Card) n. Video Memory Upgradable : 64 MB o. Case Type : Mini Tower / Desktop p. PCI Slots : 4 Minimum q. ISA Slots : 2 Minimum r. Shared PCI/ISA Slots : 2 s. AGP Slots : 2 t. I/O Ports **:** All necessary parallel and serial ports (Printer, Mouse, Monitor, Key Board, Modem, etc.) u. Key Board: WIN95, 104 Keys enhanced; v. CD ROM Drive : 48× or above w. Multimedia Sound Installed : Yes x. Network Interface Card : Optional y. **Monitor :** 15 ″ SVGA Color Monitor (0.26 mm, non-interlaced, low radiation. high resolution.) z. **Brand :** *Internationally reputed brand machine Monitor/ Mouse/ CPU/ Keyboard should be from the same company.* aa) Input power: 220V, 50 MHz	
	Software's to be Supplied with each Computer : a. Operating System: Windows 98 by Microsoft Corporation, original licensed copy b. Microsoft Office (Office 2000 XP licensed copy pre-loaded)	

Sl. No.	Description and Specification Required	Remarks
2.	**UPS to be supplied with each computer :** Supplying and installation of high quality uninterrupted Power Supply Unit with a minimum individual capacity stated below with automatic voltage regulation: a. Capacity : 1000 VA b. Input Voltage : 170-260 V c. Output Voltage : 220 ± 15 V and built in AVR d. Backup Time : 20 minutes (minimum) e. Input Frequency : 50 Hz f. Output Frequency : 50 Hz g. Transfer Time : 5 ms maximum	
3.	**Laser Printer :** a. Print Speed : 32 ppm (Pages per min) b. Print Colors : Black c. Resolution : 1200 DPI d. Print Languages : PCL 5, PS level 2 e. Paper Trays : 3 Minimum f. Input Capacity : 1,100 Sheet Min g. Media sizes : 11.7 x 17.7 in Max. h Connectivity : ECP, EIO slots i. Input power : 220-240 Volt, 50 Hz. j. Preferred Brand : Hewlett Packard	

Section C3
Users Manual - Detailed Instructions for Users of RAMPS

SECTION C3

Ministry of Works, Housing and Communications

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APPENDICES

1. Introduction

The Rehabilitation and Maintenance Management System (RAMPS) is a software application developed to facilitate effective planning and systematic management of rehabilitation and maintenance works on District roads and community access roads throughout the country. RAMPS software has been developed in MS Access. It is an updated and expanded data management and planning tool based on Routine Management Planning System (RoMAPS) developed at an earlier date. RAMPS provides "on screen" and interactive decision supports to District Engineers for annual roads maintenance planning which is based on a number of rational factors and the availability of funds.

One obvious and important element for road development and maintenance planning is an inventory of roads. However, updating of the road information is a continuous process as the road condition, surface type etc. are changing continuously. Thus handling this road update at the central Ministry is a major work and it is most obvious there will be a backlog in completing this work. Basic road network inventory and annual road condition surveys are done at the district offices and RAMPS assists to feed surveyed data into the computer at the same district offices. National database is developed at the Ministry through collecting district-wise database from different districts in diskettes in a uniform exported format and accumulating those data into a single database. No data is manually entered in computer at the Ministry.

Another important aspect of RAMPS is that the road information stored in the database is compatible to a future link to the GIS database. However, it is required that there is complete matching between road database and the road map by common ID numbers. The matching is in such a way that all roads in the database are completely consistent with the roads in the road map. That means, each road shown in road map will have an unique ID number which have a corresponding entry in the RAMPS database and vice versa. Any change in road database entry should be reflected in the map.

Another feature of RAMPS is that it can run under ***client-server*** setting. Under this setting, actual data is stored in a central server (at a single unique location) and all data entry and update operation is applied only on that database. Whereas, interface software of the system (***front-end***) is installed in all workstations in the Ministry. Interface software establishes a link to server database through Local Area Network (LAN). Same data can be accessed simultaneously from multiple workstations through LAN in the Ministry. User(s) having administrative privileges on data can do update operations on the database from any

workstation whereas general users can only view the data without performing any update. Type of privileges on data is validated through user name and password.

This document provides step by step guidelines to install and operate RAMPS application and describes underlying logic of various calculations used in the program. It has been assumed that users of RAMPS application have experience in use of computer and some basic idea on database application.

2. Features of RAMPS

RAMPS application has been primarily designed to facilitate planning of district road network development. However, it can be applied to National and Community Access Roads as well and its scope could be extended up to the implementation phase of road development works (that is monitoring and reporting of development works). The following features have been incorporated in the present version of RAMPS (i.e. in version **1.1**).

- Management of Road Network Inventory which includes both road embankment and structures.

- Management of road condition survey data, with a provision that the data could be linked to GIS database in future.

- Annual assessment of road work expenditure and calculation of maintenance costs for each section in the road with a breakup for routine, periodic and rehabilitation work.

- Cost-effective ranking of roads.

- Interactive selection of road sections to prepare annual work plan through browsing road sections and comparing cost of selected works on a road with funding source-wise budget ceilings.

- Distributing of cost of road works to different funding sources (funding source-wise in annual work plan).

- Provision for a separate set of unit cost tables for each district, which can be maintained both at district and at the Ministry.

- Data export-import facility. The inventory and ADRICS is entered in the district offices and can be then downloaded to a floppy diskette using "Data Export" module of the RAMPS. When the floppy is sent to the Ministry (or the file downloaded from RAMPS sent via e-mail), the Ministry can then upload the specific district data into their database through "Data Import" module of the RAMPS.

3. Data Collection

RAMPS has been designed on the basis of existing method of data collection namely Annual District Road Iventory and Condition Surveys (ADRICS). Although RAMPS provides data management and planning assistance to different level of road administration (viz: district level, ministry level etc.) all data required by the system are entered at the district level. This is in accordance to the fact that the data collection machinery exist at the district level, both in terms of administration and in terms of capacity.

The following three types of data are required by the system:

a) Inventory of District Road plus Community Road – supported by road network maps.

b) Road condition survey data

c) Sub-county road preference and population data – supported by maps.

Road inventory and road condition survey data consist of information on both road embankment and appurtenant structures (bridges/ culverts) and accordingly two different formats namely **Form-A** and **Form-B** are respectively used for collection of those data. Sub-county road preference data are collected using **Form-C**.

In case of road inventory and condition survey data, road map is one of the very important elements. Experience shows that during development of road network in an area, definition of the network is always changing. For example, a part of a road alignment may detach from one road and may join to another road in the network while development of the second road
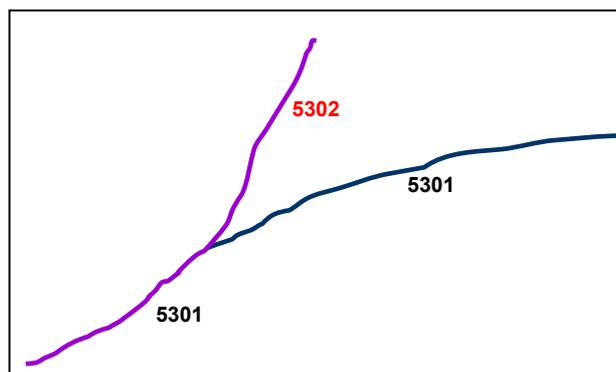
takes place. Similarly, a whole road alignment or a part of it may be upgraded to higher category (for example community road may be changed to district road). Thus if the management of road development information is attempted only using the list of road names without using any supporting maps, the whole effort of the planning exercise may bring incorrect outcome. For example, all information of a bridge located at say 10+700 meter chainage would become unreferenced if the road alignment itself is disjoined to another road from a chainage say 10+000 m. Thus road inventory must be supported with maps where ID

numbers of each road must be shown clearly along the road alignments. Both road inventory and road maps need to updated each year.

4. Installation

RAMPS requires windows operating system of version Windows 95 or above and suggested RAM in the computer should be 32 MG or above. Although RAMPS is based on MS Access
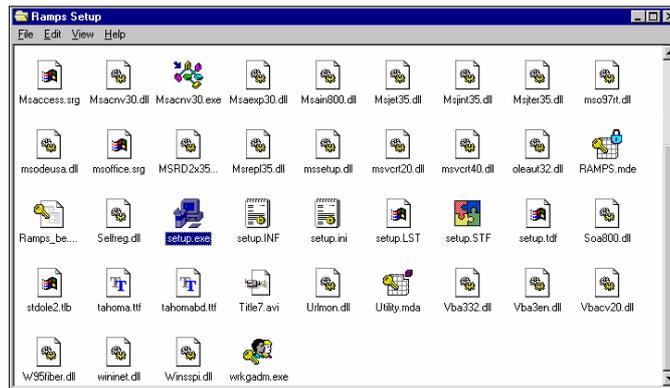
Fig-1: List of files coming with RAMPS Installation CD

97, it is not necessary to have MS Access 97 or Office 97 in your computer. RAMPS installation CD contains runtime version of MS Access 97 and associated dynamic link library files and it installs those files during the process of installation.

Put your installation CD in the computer and wait for few seconds. RAMPS installation will be started automatically. If the "**Auto Insert Notification of CD**" in your computer **is set off**, you need to activate the installation manually. Find the **setup.exe file** from the installation CD, and click on it to activate the installation. A snapshot of the files coming with RAMPS installation CD has been shown in figure-1. The installation starts with a welcome screen as

Fig-2: Welcome screen in RAMPS Installation process

shown in figure-2. RAMPS installation is very much similar to installation of any other Windows based program. All what you have to do is to keep pressing on the default buttons.

In the following screen of the setup program, you will be asked to enter the type of installation namely "Typical", "Custom" or "Compact". Always choose "**Typical**" installation. As a default setting in the setup program, you are also given an option to change the folder
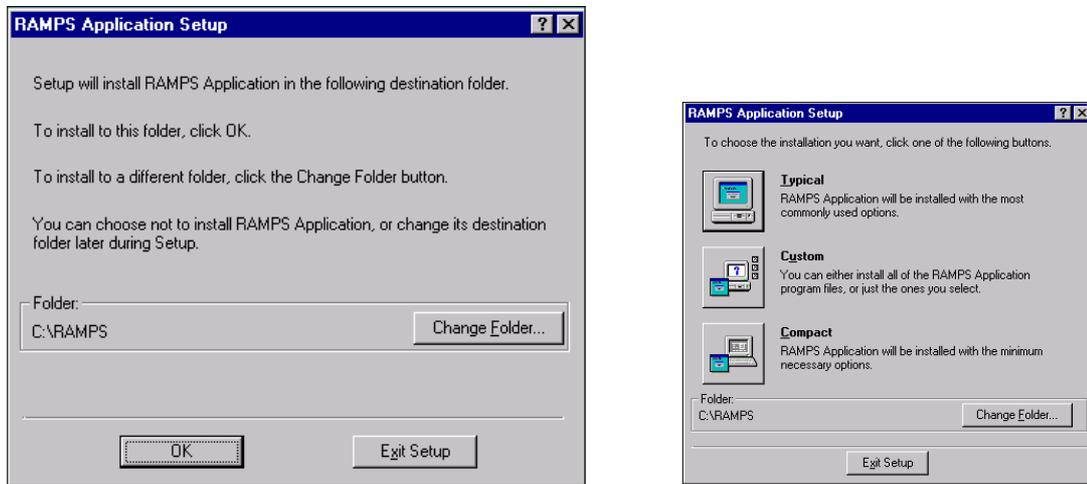
Fig-3: Selecting Type of Installation and choosing folder to install RAMPS

for installing RAMPS. However, **never** change the default folder and always keep your home directory for RAMPS as **C:\RAMPS**; see figure-3. Remember that RAMPS has been designed to work under *client-server* setting. In the default installation, both the client interface (i.e: **RAMPS.mde**) and server database (**RAMPS_be.mdb**) are put under C:\RAMPS folder. Although not suggested, you may take away your client interface (i.e: **RAMPS.mde** file) to any location in your hard disk (say on the desktop) and you can run the program from that changed location. However, you are not allowed to change the location of RAMPS_be.mdb. Because, the RAMPS_be.mdb file contains the actual data which are recorded during the operation of the software and the interface file establishes its link to the back-end database at the location **C:\RAMPS\RAMPS_be.mdb**. It is possible to change the back-end location of RAMPS database, for example, if you keep the database in a server. However, it needs some better understanding of MS Access/ database applications and it is not advisable to go for that at the initial stage of database development.

Fig-4: Creating shortcut of RAMPS on Desktop

RAMPS uses a number of Windows' shared files, which are used by other applications in your machine. During installation process while copying files from CD to hard disk, if RAMPS setup finds some shared files (e.g: **WinNet.dll**, **URLMon.dll** etc) already installed by other program (e.g: MS Access 97/ 2000 etc), it will ask your response whether you abort installation or **ignore** the file. Chose "**Ignore**" in the prompt and continue installation.

When installation is finished, a shortcut will be automatically placed in the "Programs" sub-menu of Windows "Start Menu". Name of the shortcut is "RAMPS Application". If you like to put a copy of **the shortcut on the Desktop** of your computer, put cursor on the "RAMPS Application" shortcut (in Programs sub-menu), and click "**Right**" button of the mouse. Then click on the "Send To – Desktop (create shortcut) command as shown in figure-4. If you want to create a new shortcut in any other location, use the following **command line** for the shortcut: *C:\RAMPS\OFFICE\MSAccess.EXE C:\RAMPS\RAMPS.MDE*

5. Uninstalling/ Reinstalling the Software

It is quite likely that you may need to uninstall or reinstall the RAMPS application for whatever reason. To uninstall RAMPS, it is suggested **not to directly delete** files under C:\RAMPS. Rather use **setup.exe**, program to uninstall your RAMPS. The **setup.exe** application is either located under C:\RAMPS\SETUP folder or you may use the program
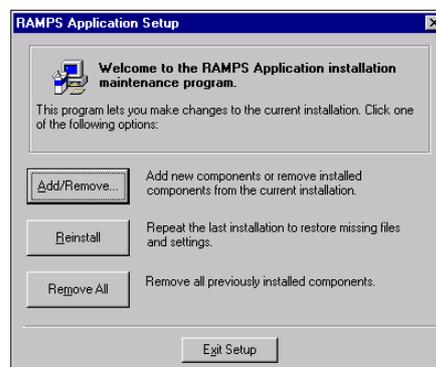
Fig-5: Uninstalling RAMPS Application

from your RAMPS installation CD. If you have any data in the database and you want to use those data after reinstallation of the program, make sure to backup the following files before uninstalling RAMPS if you want to restore your data after reinstallation of RAMPS:

    a) **C:\RAMPS\RAMPS_be.MDB**
    b) **C:\RAMPS\RampsLUT.MDB**
    c) **C:\RAMPS\ExpoImpo\MyDataBAK.MDB**

Backup the above files under any other location such as C:\My Documents (other than C:\RAMPS). There are two ways how you can restore your data after reinstalling RAMPS.

Method-I: Export your data into a file called **MyDataBAK.MDB** (refer to the data export operation of this Manual). Copy the file from C:\RAMPS\ExpoImpo folder to a safe location such as C:\My Documents (as described above). Then when reinstallation is finished, copy the file **MyDataBAK.MDB** to C:\RAMPS\ExpoImpo folder. Now use import operation of RAMPS to upload the backed up data into your database (refer to the data import operation of this Manual for details).

Method-II: Copy both RAMPS_be.MDB and RampsLUT.MDB from C:\RAMPS folder into a safe location (e.g: C:\My Documents). When reinstallation is finished, copy both the files (RAMPS_be.MDB and RampsLUT.MDB) from the backup location (e.g: C:\My Documents) to C:\RAMPS.

For a safe restore of data, it is always suggested to follow **method-I** whenever possible. However, there could a situation when the RAMPS software is corrupted (for instance a file is deleted by whatever reason and RAMPS software does not open), then you can not use method-I to export data. In such situation, first restore the data following method-II and **repeat** the whole re-install process using **method-I** (i.e, export data to **MyDataBAK.MDB,** uninstall RAMPS, reinstall RAMPS for the second time and then import data as stated in method-I). If your RAMPS_be.MDB is deleted for whatever reason, you will loss all data in your database and you have to build the database from the beginning. As such, it is always suggested to keep a regular backup of the following three files: **i)** RAMPS_be.MDB, **ii)** RampsLUT.MDB and **iii)** export file of your database (e.g: Pader_May2002.MDB - refer to data-export operation later in this Manual).

To start un-installation, first close the RAMPS application (if it was open) and preferably close all Windows applications which may use shared files of RAMPS and runtime version of MS Access. Setup program will bring a screen as shown in figure-5. Use "Remove All" button. After un-installation is complete, delete the folder C:\RAMPS. Even if the un-installation is not successful (as some files were already deleted etc.) delete C:\RAMPS before starting re-installation. Then use RAMPS setup again to install RAMPS. To reinstall your data afterwards (if any), use either *method-I* or *method-II* as described above.

Remember that when you are already quite experienced using RAMPS and you already know which files are used for what purpose, you may use the second button of RAMPS setup program (i.e: *ReInstall* button, see figure-5) and may avoid method-I or method-II of data backup and restore.

6. Starting the Application

The interface (forms, menus etc.) of RAMPS is stored in a file called **RAMPS.MDE** located under **C:\RAMPS** folder. You can open this file only using MS Access 97 Standard version or MS Access 97 Runtime version. As **.MDE** type files are compiled form of MS Access files, you can not open or convert it using any other version file such as MS Access 2000, MS Access XP etc. If you have a different version of MS Access installed in your computer, clicking on RAMPS.MDE will let **Windows** to open the file using the program **you used last time** to open any **.MDB** or **.MDE** type files (as **.MDE** is a common type file to all versions of MS Access). That means if you opened any **.MDB**/ **.MDE** type file using MS Access 2000 anytime, clicking on RAMPS.MDE in the next time will link to MS Access 2000, not to MS Access 97 runtime. To ensure that the RAMPS.MDE is opened with runtime version of MS Access 97 use the shortcut placed at Program sub-menu of Start menu or a copy of the shortcut on the desktop (as created using figure-4).

Fig-6: Shortcut Icon in desktop to start RAMPS

Clicking the "RAMPS Application" **icon** in desktop (figure 6) opens the program and a window as shown in figure-7a appears on screen. There are nine buttons in the screen, which comprise main Switchboard of RAMPS. These buttons remains inactive as long as the
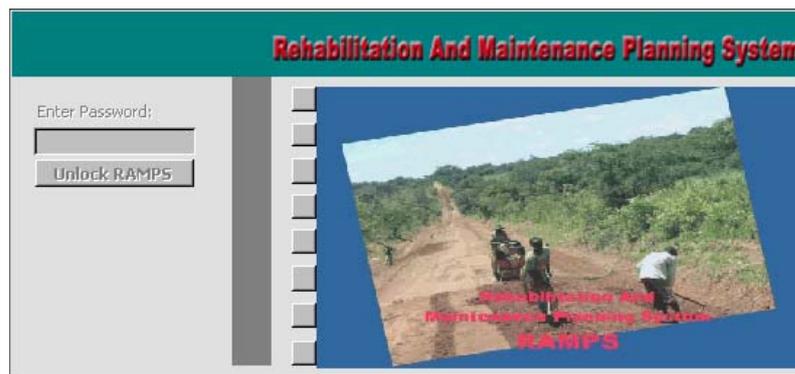
Fig-7a: Open-up window of RAMPS software

animation clip is running. Press Esc button <u>twice</u> and enter password to activate the buttons of the switchboard. (see figure-7a). As the animation clip stops, cursor will be placed into the password text box. Initial password of RAMPS is **lira**, which you can change any time. This password protects RAMPS database from any unwanted modification of data.
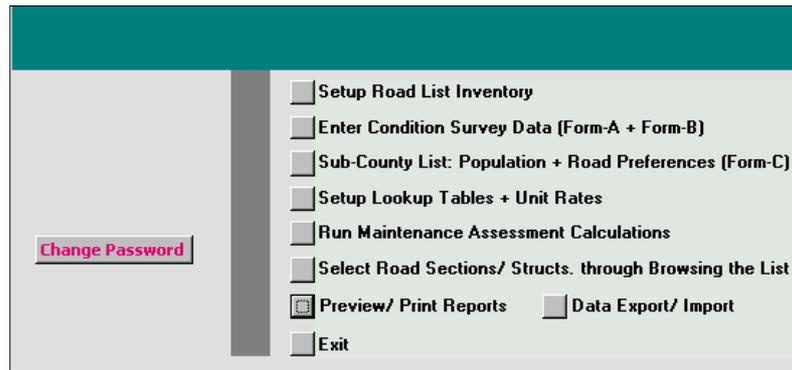
Fig-7b: Open-up switchboard of RAMPS software

Each button in the switchboard is responsible for a specific function of RAMPS; refer figure-7b. The buttons are arranged in a sequential order starting from basic data entry to road work cost calculation and then interactive decision making through selecting road sections. A brief description of the functions of the main switchboard buttons are stated as follows:

Button	Functions
1. Setup Road List Inventory	This button enables to enter and edit the list of roads in a district with some basic attributes of the road such as name, road class, length, etc. Each road is identified by a unique ID number.
2. Enter Condition Survey Data (Form-A + Form-B)	This button is used to record annual road condition and structure condition survey data (Form-A and Form-B respectively). To enter road condition survey data, it is first necessary that the basic road inventory of the corresponding roads is set up.
3. Sub-county List: Population + Road Preferences (Form-C)	This button is used to enter sub-county preferences for district roads. List of sub-county and population in each sub-county are also entered through this button. Once road preferences and population of a sub-county are available, number of persons in the sub-county using each road in the preference list are then calculated.
4. Setup Lookup Tables + Unit Rates	There are a number of lookup tables used by the program such as "Road Classification Factors", "Surface Condition Factors", "Performance for Surface Material Factors" and so on. Some of the lookup tables (e.g: Unit Cost table) are open to district engineers and some of them are accessible only by the person (i.e: by the Ministry) responsible for the national database (e.g: List of Districts, List of Funding Sources, cut-off factor for MCI etc.)
5. Run Maintenance Assessment Calculations	Once section by section condition of road embankment, shoulders, etc are available, and unit costs of each road maintenance item is entered, use this button to calculate costs of maintenance works of each road section. Run this calculation as each time you change either road condition or lookup table values or unit cost or sub-county preferences.
6. Select Road Sections/ Struct. through Browsing the List	As maintenance cost calculation is done, cost for all road sections along with required maintenance interventions for those sections (viz. periodic maintenance, rehabilitation, and repair of bottleneck and so on) are available. Given that the full amount for road maintenance works is available, you do not have to think anything about any prioritization.

6. Contd..	However, it is always likely that there is scarcity of fund and you have to go for prioritization. RAMPS determine cost effective ranking of roads based on cost of maintenance work and population served. However, you might have some other commitments (such as repair of a particular bottleneck) which may not match the ranking. Thus in order to do effective planning, you have to consult cost-effective ranking list, map and maintenance interventions (as determined by RAMPS) simultaneously to match your budget ceiling. You can do this work interactively through browsing road sections, selecting particular roads, and you can apply common or individual maintenance interventions on sections of a road and then you can assign source of fund to each road.
7. Preview/ Print Reports	All kind of printing and viewing the result of queries in the standard formats is done using this button.
8. Data Export/ Import Operation	District Engineers use this function to download their data (entered in their computer) in a floppy (data export) and Ministry uses this function to upload the data coming from district to their computer (data import).
9. Exit	To exit the program.

7. District Selection Form

One very useful function of any database management system is to handle the data in such a way that edit or update (adding, deleting, changing etc.) of data and retrieving of all or any specific portion of data is easy, quick and as a whole, efficient. If it is required to edit any information about a road, first it is required to pin-point and access the particular record of the road from a huge store of records. If the data were in any worksheet or any equivalent format (e.g: MS Excel) in unstructured condition then it was required to browse the whole document (of say 25 MB size) and it probably took several hours to access a single record! Fortunately the RDBMS (Relational Database Management System) enables the job to be done within few seconds through filtering data or through specifying key attributes of the entry provided that the system is designed to gain such efficiency. Design of RAMPS ensures such faster access to any desired road within the database.

To find any specific road from the country database (or from district database), first select name of the corresponding district in "District Selection Form" (see figure-8). To sort and filter out district in the dropdown list, districts are divided into regions (as per 6 regions of
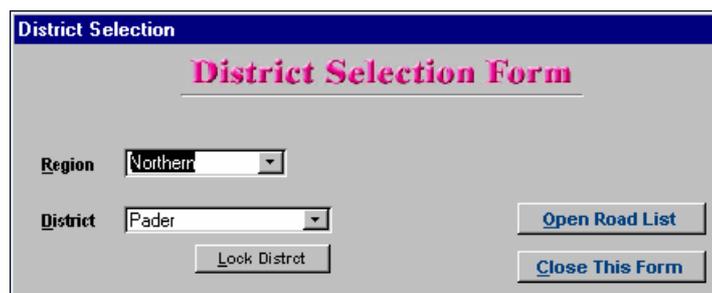
Fig-8: Selection of district using combo list

Uganda). Default name in the district selection form is Pader under Northern region. As you close the from, your selected district name will be changed back to "Pader". If you work only on a particular district (in case of working in a district office), lock the district name using "Lock District" button. After you have selected district name, click on the "Open Road List" button an get the list of roads (if entered before) in the selected district.

8. Working with Road List

Road list form consists of list of roads in a district with its basic attributes such as road name, road class and road length; refer figure-9. An additional column apart from the road attributes is included in the form is "date of edit". This is to keep track of your data entry and update management. Road list form provides four basic functions as follows:

       a. Add a New Road in the List

       b. Delete a Road From the List

       c. Filter the road list on the basis road class

       d. Find any specified road from the list on the basis of its name or code number.

Fig-9: Road List Form

To add a new road in the list, press on the "Add a New Road" button and you will get a new entry at the bottom of the form with default road class "District Road-I", date of entry as clock date of your computer and other column values as blank. Fill in the blank columns with appropriate values and name. Note that, road code in the list should be nationwide unique irrespective of its class category. As per the present convention adopted by the Ministry, road code is a 4-digit number where first two digits stand for the code of the corresponding district. You may use any other convention as approved by the Ministry; provided that all roads in the country would have a unique ID number and numbering of the road can be

given and maintained easily. At present there are seven road categories given with the default road class list of RAMPS – which is obviously editable.

You have the option to follow same or different maintenance policy and methodology for **National Roads, District Roads and Community Access Roads**. However, when inventory management is concerned, in the view of database management, it is always useful to follow same structure for all classes roads and to maintain a common database for all class roads as well. As you store all road data in the same database, list of the road will become long and it will be difficult to find any particular road from the list. To avoid long list browsing, you can filter out your road list based on road class. To do so, select the road class (on the top left of the form) and press "Apply" button. If you want to undo filter, press "remove" button of the form. If you want to find any specific road from the list by its name (or any word in the name – say *Puranga*), put the cursor on the top row of "Road Name" column and press "**Ctrl+F**" hotkey. A popup window as shown in figure-10 will appear on screen. Type in the text string (puranga in this case) in the text box labeled "Find what". Remember to select "**Any Part of Field**" under match button as you are not sure about full and exact name of the road. Similarly, if you want to locate any particular road ID, put the cursor on "Road Code" column of the form and press "Ctrl+F" key combination. If you want to delete a road from the road list, put the cursor in any field of the particular road, and press "delete road" button. RAMPS will take a confirmation from you whether you are sure to delete the road. Responding "Yes" will permanently delete the road and **all associated data of the road** from the database (such as condition survey data, structure list, road name from sub-county preferences list etc.) and it is **NOT reversible**. So, do it carefully if you really want you delete a road from the database. Close the form and go back to main switchboard when you finish road inventory data entry.
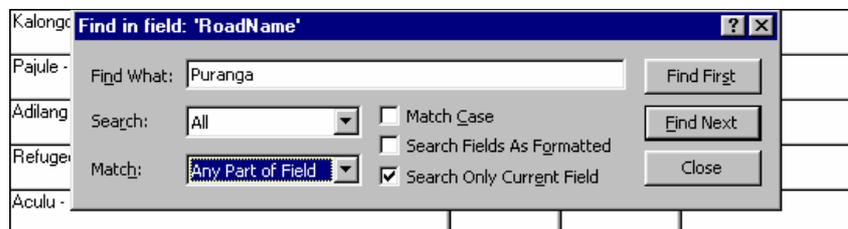
Fig-10: Finding a road from Road List Form

One last point on Road List form. The road length you enter in this form will be cross-checked when you enter road condition survey data. Detail about road condition data will be discussed in the next section. However, as total length of a road is divided into a series of continuous sections, length of the road is changed to "To-chainage" of the last section of Form-A during condition survey data entry.

9. Entering Condition Survey Data

Road and structure condition survey data are entered using Form-A and Form-B of RAMPS and layouts of those are identical to the data collection forms used during ADRICS. To open Form-A or Form-B, you have to use second button of main switchboard. There were two different ways how you could open section information of a road – either entering ID number of the road or through selecting the road while browsing the road list. RAMPS offers you the

Fig-11a: Road Condition Assessment Form (Form-A), *Page-1*

Fig-11b: Road Condition Assessment Form (Form-A), *Page-2*

later option – that is browsing road list. Advantage of browsing road list are firstly you do not have to remember road ID number, secondly you get a guide as you see road name, road length etc. attributes when browse list and thirdly there is less chance to open a wrong road which is obvious if you open it by typing its ID number. Obviously you do not have to browse whole road list in the database. You can pin-point a road by first filtering the road list of a district and then you can further filter out a shorter list for a particular road class (refer to section-7 above). As you open road list form (see figure-9) using second button of main

switchboard, you will see there are two buttons at the top right corner of the form labeled "Open Form-A" and "Open Form-B". Press appropriate button to open road sections.

The "Road Condition Assessment Form" consists of 23 columns and the column headings are identical to Form-A of ADRICS; refer figure-11a & 11b. As these 23 columns do not fit in the computer screen together, the form has been divided into two pages namely Page-1 and Page-2. The following functions are performed under the "Road Condition Assessment" form:

a. Adding a New Road Section in the list

b. Deleting a Road Section From the list

c. Splitting a road section into two

d. Maintaining continuity of the road sections (in terms of chainages) starting from 0 to the end length the road irrespective of addition/ deletion/ splitting of the sections.

e. Attributes of the roads are bound to combo box lists so that data entry is comfortable and chance of wrong data entry is less. A number of data validation checks have also been incorporated.

f. Assigning sequential number to road sections in order of chainage values, when there is any gap section serial due to deletion of one or more sections.

A road section can be added to the list in two ways – by pressing the button labeled "***Insert A New Section***" or by pressing hotkey Alt+I. Adding road section behaves three ways in three different situations. If there is no sections yet inserted for the selected road, a new section will be added to the road with start chainage 0 and end chainage 2500. Edit end chainage of this first section to define your entire road in one section. Now if your mouse is placed at any section of the road other than the last section, the underlying section will be divided into two equal sections. Say your original section was 0-10 Km (start chainage 0 and end chainage 10). As you press **Alt-I** keeping cursor on this section, the section will be split into two equal and continuos sections - 1st one with 0-5Km and the 2nd one with 5-10Km. After insertion of the section, cursor will be placed on the new section and the original section with all the existing attributes will be pushed down. New section will get serial number of the parent section and serial number of all sections at the bottom (if any) including the parent section will be increased by one. Note that as you have inserted a new section, your cursor is placed on the to-chainage of the new section. As you change the value of to-chainage, of any section, the from chainage value of the next chainage is changed

automatically to keep continuity between all roads sections. Thus the reason for keeping the new section on the top of the parent section (pushing the parent section down) is that, you can immediately change the value of breaking point chainage, without any extra cursor movement and you can then type in the attribute values of the new section.

If your cursor is at the last section in the list and you have pressed **Alt-I** button, the new section will be pushed down with the serial number next to the last one. The reason for pushing the section this time down is that RAMPS software assumes that you are creating sections of the road for the first time and as you have completed entry of a section, you are going to enter data of the next section. To-chainage of the new section will be 2500, which you will obviously change.

To merge sections, just delete the extra sections and then change attribute values of the merged section (if required). As you delete a section, section serial number will not be automatically adjusted. If you allow RAMPS to adjust road section serial numbers automatically, section number of the deleted section will reappear and you will be confused whether the section has been deleted. Nothing unlikely that you delete the section again by mistake in such situation. However, you may give sequential numbers to your road sections by pressing the button labeled "**Re-assign Sec Number**".

To navigate between pages of "**Road Condition Assessment**" form, click on the tab buttons (page-1 and page-2 respectively, see figure-11a, 11b) of the form. However, as you fill in the section attributes and reach last *item* (column) of page-1, RAMPS will automatically take you to the next column of the same section on page-2. Similarly, if you are at the last *item* of page-2, RAMPS will take you to the 1st *item* of page-1.

In the column-xv to column-xvii, you may enter bottleneck information of road sections. As you can see that if you enter "yes" to column-xv, other two items viz: "bottleneck type" and "size" of the bottleneck are enabled. As default setting, the only bottleneck for road section is "embankment failure", However, there is provision to add bottlenecks to the list.

Last column of the form is "Remarks" column. You can record any text note on a particular section in this column. You can store up to 64 kilobytes text remarks (more than sufficient!) against each section. However, in the page display, there is a limited space to enter the remarks. It is possible to get a large text box for entering comments through zooming the "Remarks" field. Remember that **hotkey** to zoom a field is **Shift+F2** key combination.

The last point to note on "Condition Assessment" form is that section serial number, chainage, etc. columns are bound to both pages of the form. Reason for repeating these columns is to let you identify the sections correctly when you enter data. However, there is a

drawback to bound same data in two pages of an opened form. As you insert record (a new section) to the active page (say page-1), records of the other inert page (page-2) will not be updated. If you then navigate to other page (page-2), MS Access will try to do two things simultaneously – it will update display of the page-2 from memory cache and at the same time it will try to accommodate the new section in the display. Subsequently "**write-conflict**" may appear. Although a number of measures have been adopted to protect the "**write-conflict**", it is not possible to avoid it completely. If you get any alert message of "**write-conflict**", just click on the **"drop changes"** button of the dialogue box. Write-conflict may also occur if you type-in the data very fast in "Page-1" of the form. To avoid the "write-conflict" error when you enter data, allow some time (2/3 seconds) for RAMPS to save the data of page-1 before you move to page-2.

10. Entering Structure Inventory/ Condition Survey Data

Both basic information and condition survey data of structure are recorded in Form-B of ADRICS. Corresponding layout of Form-B in RAMPS is shown in figure-12. Data entry for structure inventory and structure condition data in RAMPS is very much similar to that of road condition data entry and it is simpler in this case. There are 12 columns in structure condition assessment form, which are accommodated in a single page. As you can see in figure-12 that some columns in the forms are shaded with gray color, which remain inactive when you enter data. The columns with heading "culvert only" are activated only when your selected structure type (as in column-ii) is culvert. Similarly, "Num of Bridge Span" is activated only for bridge structures. As you navigate across rows of the form, shadings of the column also changes with respect to structure type in column-ii. To enter a long text in remarks, press **Shift+F2** while your cursor is at Remarks item. List of types of structures has been taken from ADRICS guidelines. One important convention for structure attributes needs to discuss here. "**Width**" of a structure is its dimension across the road alignment and "**Length**" is the dimension along the road alignment, both are measured in **meter**.

Fig-12: Structure Inventory/ Structure Condition Assessment Form

When you finish data entry, RAMPS automatically update number of bridges and culverts in the road, which are used to display in "Road List" report of the software.

As you enter cursor into "**bottleneck-type**" column, you can see the list of various structure bottlenecks in the drop-down list (viz: New Bridge, Culvert Repair etc.). You can select any bottleneck from the list or you can enter bottleneck code number in the field – however, when you finish, only code number of the bottleneck is displayed in the form. For type of bottlenecks, refer to the "item of works" LUT of RAMPS (figure-17), where you can add or edit list of *item of road work.*

11. Entering sub-county road preference data

Sub-county road preferences are entered into RAMPS in two steps. First you enter list of sub-counties under a district (see figure-13). In the sub-county list, there are 9 columns and all these columns have been taken from Form-C of ADRICS. Some of the attributes are off course different for different rows (e.g: sub-county "Population", "Area", etc.), whereas

Fig-13: Entering Sub-County List under a District

content of some other columns repeat in different rows (e.g: "Data Source"). To repeat the content in the bottom row, press the short-cut key **Ctrl+Apostrophe** (i.e: **Ctrl+'**). Date column in this form is in short form i.e. 3-digit month and 4-digit year (e.g: **Jan/2001**) – as you have not to record very specific date, rather month and year will keep track of the update.

Once you have finished entry of sub-county list under a district, you may now proceed to enter list of roads preferred by a sub-county. To open a sub-county preferred road list, put cursor in any field of the desired sub-county (see figure-13) and then press "***Open Form-C***" button. In the sub-county road preferences form (see figure-14), enter list of roads preferred

by a sub-county one by one. When you add a new road in the list, by default, RAMPS will find out any road randomly from the database that belongs to the **selected district**. As you correct the **road code number** (see figure-14), the corresponding road name will appear in the list and that road will be added to the preferred list of selected sub-county. If you type any wrong entry in the road code field, RAMPS will display an error message - "**No road found with entered road-code**" – however, the road name will not be changed from the list. So either re-enter correct code number or delete the road from the list, when you enter wrong code number to a road.

Fig-14: Entering Sub-County Road Preferences under a District

At the top-left of the form, name of the sub-county, total population in the sub-county etc. information are displayed. Now as you add new row (i.e. new roads) in this form, total population in the sub-county will be **equally** distributed to each road in the list. For example, there are say **30,300** people under "Pader" sub-county. If you have added three roads under Pader sub-county, it will substantiate that each road in the list has been preferred by **10,100** (=30,300/3) people in the sub-county. (Number of population served by each road is displayed at the footer of the form, see figure-15). Now if a road is entered twice in the list and there are 4 road entries under a sub-county, that particular road will get **2P/4** peoples' preference, whereas, other two roads will get **P/4** peoples' preference (here, **P**=number of people in the sub-county). To calculate total preferences for a road (in other words, population served by a road), RAMPS aggregates number of people against that road in different sub-counties. Remember that not necessarily a road in a sub-county preference should belong to the sub-county's parent district – rather a road in the list may come from different district (obviously, this is applicable for the border area sub-counties of a district).

12. Entering Lookup Table Data

Lookup tables are the small size tables, generally having 2/3 columns where 1st column represents code number and 2nd column represents description of an entity in a database system. These tables are referenced (or looked up) by other large tables in the database by

the code the particular entity and the description (or other value) of the entity are obtained from the lookup table into the large table. For example, **road-classification** lookup table has at least two columns, *road-class code* and *class name.* In the **road list** table, a column contains *road-class* code (1,2,3… etc.) for denoting road-class of each road, <u>instead of</u> keeping a "road-class name" column itself in the road list table where class-name text (e.g. National Road, District Road etc.) had to enter **for each road**. If you had to enter full road class name for each road in the road list, there was every possibility that you made mistake to type correct spelling of road class and different rows in the road list might appear with different spelling for road-class and if you say wanted to count "how many roads are there under **District Road Class-I** ?", obviously you got wrong result. Lookup table of RAMPS include the following list; refer figure-15.

i) Road Classification
ii) Road Surface Type
iii) Performance of Surface Material
iv) Proximity of Re-surfacing Material
v) Traffic Groups
vi) Drainage Condition

vii) Shoulder Condition
viii) Surface Condition
ix) Band of Maintainable Condition Index
x)   List of Maintenance Works and their Unit Cost
xi) List of Funding Sources and District Budget Ceiling
xii) Interval of Periodic Maintenance
xiii) List of districts and regions

There are two different levels of password protection for the lookup tables - some of the tables are accessible to the district engineers who maintain password of start-up switchboard of RAMPS. Other tables are protected by a different password, which is maintained at a central place (i.e. at the Ministry) where the national road database is maintained. The lookup tables open to the district engineers are as follows:

i) Unit Cost table
ii) District Budget Ceiling table (put at funding sources page of LUT form)
iii) Periodic maintenance Interval Matrix

To access other LUTs (at Ministry), press on "**Allow Edits**" button of the form and enter appropriate password in the following dialogue box screen.

The values of lookup table factors and weight factors to combine values of different look-up tables have been used in the calculation of maintainable condition index (MCI). What type of maintenance interventions (routine, periodic etc.) should be applied to road section is directly related to MCI values. So to change values of lookup table factors, you must have good engineering understanding about implication of different factors on road maintenance work.

Fig-15: Lookup Tables of RAMPS – **Page-A**

Lookup tables have been arranged in 8-pages in RAMPS namely Page-A, Page-B, Page-C, Page-D, Unit Cost, Funding Source, District Table and PM Interval (see figure-15). You can access any page of the form by clicking on the respective **tab** of the page.

Fig-16: Lookup Tables of RAMPS – **Page-C**

In Page-D of Lookup Table window (figure-17), you can edit two tables: **a**) List of Road Works and **b**) Maintainable Condition Index Band. Maintenance works have been divided into five categories as follows:

a) Routine   b) Periodic

c) Emergency   d) Rehabilitation

e) Bottleneck

Cost of maintenance of each section is calculated on the basis of specific item of works required for the section. For example, if calculated Maintainable Condition Index of a section is 1.7 (within 1.5 and 2.0), it will be set for routine maintenance of band-2, i.e. second item of
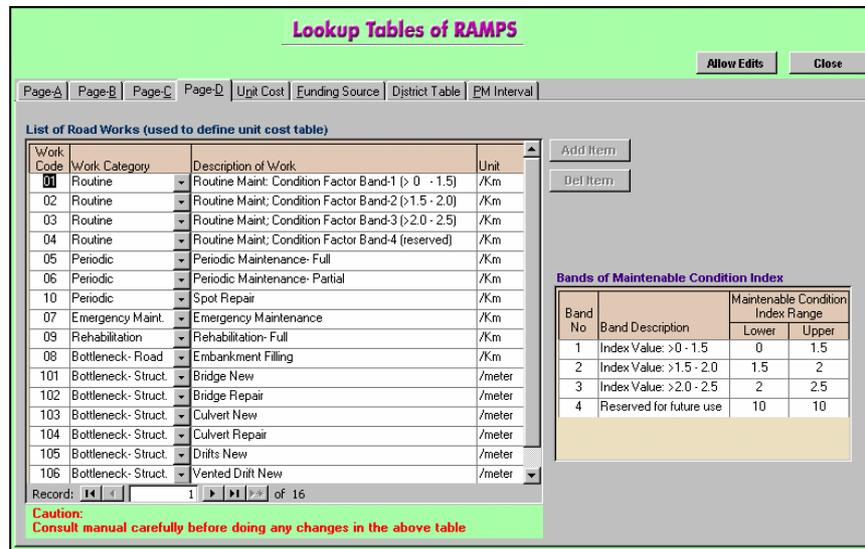
Fig-17: Lookup Tables of RAMPS – **Page-D**

road works. To add or delete any item of works in Page-D, first press "**Allow Edits**" button in the form and then enter appropriate password in the following screen. "Add Item" and "Del Item" buttons in the page will then be unlocked and you can use them for appropriate operation. When you edit list of road works table, be sure that you have entered appropriate unit cost against that maintenance work; otherwise, you will get unexpected result. In other words, lookup tables of RAMPS are inter-related and editing of the same should be consistent. For example, you have added a new item under list of road works table (say Bottleneck- Drifts Repair), and you have not entered unit cost of maintenance for drifts repair. Now if you select bottleneck - "Drifts Repair" for a structure (**see figure-12**), RAMPS can not calculate cost of road works for the particular section, and an erroneous result will be produced.

Unit cost of maintenance works varies with respect to three factors namely **a)** District Name, **b)** Road Class and **c)** Surface Type; So remember that each district has its own set of unit cost and enter unit cost values against appropriate district. If you enter unit cost against a wrong district (for instance you have entered unit cost for Pader while you are calculating road work cost for Kitgum), you will get wrong calculation. Similarly, if you have entered unit cost of District Road Class-I type roads, it will not cover District Road Class-II category road and if there is any road under later category in your database, RAMPS will be unable to calculate maintenance cost of the particular road. To save any change in unit cost figures, use the "**Save Unit Cost**" button. Once you save unit cost table, name of the district (top left

combo box in page-5) will also be saved and that name will appear next time you open the form. There is a currency conversion factor box just below the "Save Unit Cost" button. If you change figure in the box, all unit cost *in the screen* will be applied with the changed currency rate. However, you can individually change any particular item with a different rate other than the rate you entered in the conversion factor box; refer figure-18.

The rate displayed in the screen can be saved against only a single district or against **all districts** in the database. To apply them for all districts, check the box labeled "*Apply these Unit Costs to All districts*". However, to apply the cost to any other district, there is a condition that there must be at least one item in the district with unit cost figure. For instance you want to save a single set of unit cost at a time to Kitgum, Gulu, Lira and Pader. Open unit cost table for each of the district and enter USD 250 (say) against the first item in the list of work and then save it each time (for each district). Now enter your complete list of the unit cost under any district (say under Pader), and then save the table keeping the check box (*Apply these Unit Costs to All districts)* on. You will now find that the cost has been saved against all of the four districts as stated above.

Fig-18: Entering Unit Cost of Maintenance Works

The next page (page-6) of lookup table form contains funding source LUT (figure-19). In this page, you can enter two different data namely list of funding sources and then ceiling of the district budget against different funding sources. List of funding sources is maintained at the central place and thus need 2nd level password to access them. Whereas ceiling of district budget is open to district engineers for editing. Filling in the district budget ceiling is straight forward; however, remember to fill in the figures **against appropriate district** and **save** it when you finish. Assignment of district budget figures against different funding sources has got an implication while distributing fund to different funding sources in Annual District Road

Work Plan (ADRWP) (refer to figure-25). For instance, if you have UGX 150 million and 15 million fund for road rehabilitation works in any financial year from PAF-3 and District Dev Budget respectively (see figure-19). As you **pick** section work plan of a road during ADRWP, and you do it one after another for different roads, by default all rehabilitation work will be assigned against PAF-3 until all of 150,000 thousand shilling is assigned and then for the next road, cost of rehabilitation will go to "district development fund". Off course you can always adjust this default assignment of fund and assign the cost to any funding source during ADRWP. The important point is that the default assignment will follow the way you make it in the table of figure-19 (for further explanation, refer to section-14).

Fig-19: LUT for List of Funding Sources and Ceiling of District

Open page-7 of the LUT form to enter district and region list table. If you put the cursor in any region, list of the district under that region is displayed in the right box of the page. As you add any new district in the table, the code of the table will by default be the next value of highest code number in the table, which you can edit. However, it is strongly suggested not to change the code number of existing districts in the table. For instance if you change code number of Pader to 75 (which is at present 53, see figure-20), all roads under Pader district will become unreferenced as district code numbers in the road list is still 53. The district code assigned at present to the district table is only for internal use of RAMPS and it has no bearing with the district code which you follow to define a road code (refer to figure-9). For instance, if any time the code number of Pader is approved by the Ministry as "75", you can always define the road codes of Pader district as 7501, 7502, 7503 … and so on without changing the internal code number of the district from the lookup table.

Periodic Maintenance Interval matrix values can be entered from page-8 of the LUT form (see figure-21). If PM interval is 2 then the periodic maintenance will be required each alternate year (i.e. in the year 2002 if it was done in 2000 before).
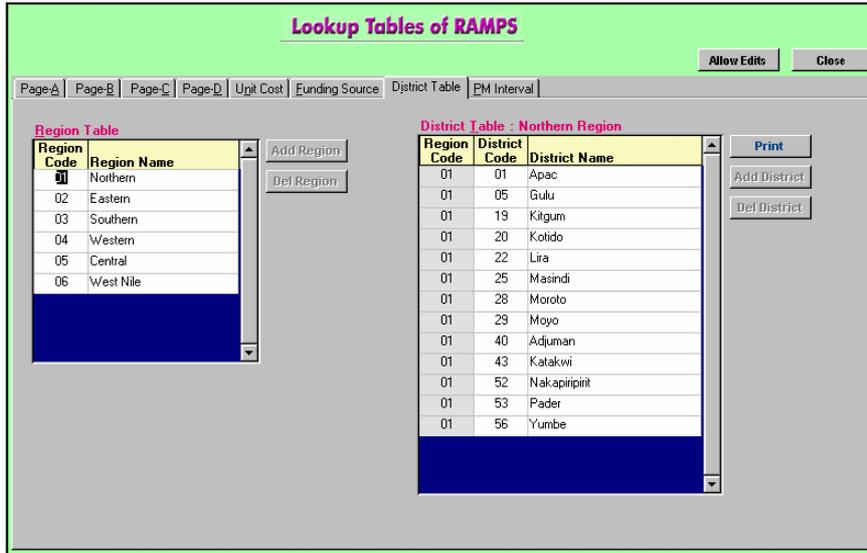
Fig-20: LUT for District and Region List
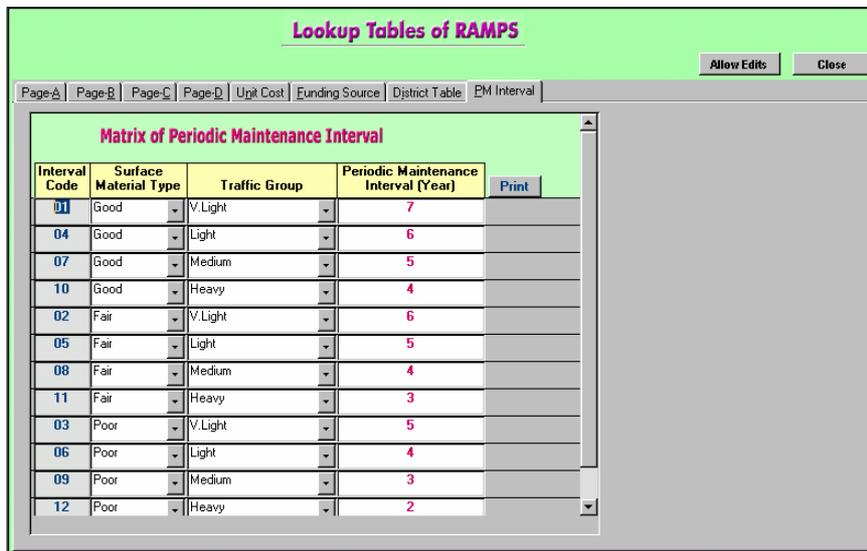
Fig-21: LUT Periodic Matrix Interval

One important point about this LUT is how you can distribute the updated list of district or list funding sources (which is maintained in the central place) to different district offices. The following lookup tables are stored in a file called **RampsLUT.MDB** which is located under C:\RAMPS.

i) List of District and Regions

ii) List of Item of Works

iii) Unit Cost Table

iv) List of Funding Sources

v) Matrix of Periodic Maintenance Interval

vi) List of Bridge/ Culvert Types

Now as you make any changes in the above tables in the Ministry and would like to distribute the change to districts, copy the file C:\RAMPS\RampsLUT.MDB in a district and send it to the districts where they will replace the file in C:\RAMPS folder with the file

downloaded in diskette. Here it is important to remember that if the RampsLUT.MDB file did not contain unit rate for any particular district (say Gulu district) replacing the file in the district (Gulu district in this case) will require to re-enter the Unit Cost for the particular district. So it is recommended to backup the RampsLUT.MDB file in a safe location (say in C:\My Documents) before you replace it by any file coming from any other place.

13. Calculation of Maintenance Cost

Calculation of Maintenance Cost in RAMPS is done for each section of a road in the network system. The calculation is based on Annual District Road Inventory and Condition Surveys (ADRICS) data, lookup table factors, unit maintenance cost and interventions (routine maintenance, periodic–full, periodic-partial etc. works) applied on selected road sections. Flow-chart of maintenance cost calculation has been shown in figure-23.

In the calculation process, first maintainable condition index (MCI) is determined for each section based on surface condition, shoulder condition and drainage condition. As you can see from the lookup tables, default values of these factors vary from 1 to 4 and as such value of MCI also varies from 1 to 4. Now if the value of MCI of a road section is in between 1+ and 2.5 then the road section will be termed as *maintainable* and will be earmarked for periodic maintenance. On the other hand, if the value of MCI is above 2.5 then the road section will be termed as *not-maintainable* (i.e. the condition is too poor/ bad to do regular maintenance) and it will be earmarked for rehabilitation. As/ when above mentioned calculation is done, next step in the calculation is to find *periodic maintenance interval* (PMI) of maintainable road sections. Periodic maintenance interval can be obtained from PMI matrix LUT (figure-21). You can see from the PMI matrix, road sections having "good" surface material and "light" traffic group need periodic maintenance at each 7th year. On the other hand, road sections having "poor" surface material and "heavy" traffic need periodic maintenance at each 2nd year (i.e. at alternate year).

In the next step of calculation, RAMPS program will do bottleneck cost calculation for both road and structure bottlenecks. Road bottleneck cost in a section is equal to size of the bottleneck (in meter) multiplied by unit cost of particular type bottleneck. On the other hand, cost of structure bottleneck is equal to length of structure multiplied by unit cost of specific bottleneck. All bottleneck cost are assigned against corresponding section of the road, even in case of structure bottlenecks. Remember that structure bottleneck is recorded against chainage location of the structure whereas RAMPS transfer this bottleneck cost from the chainage location to the corresponding road section. For instance, if there is a structure bottleneck at **2.5Km** chainage and the break-up of the road sections is 0-1.2Km, 1.2 –

2.0Km, **2.0 – 2.7Km** … etc. then the cost of bottleneck of the structure will be assigned against the 3rd section of the road (i.e. at 2.0-2.7Km).

Once maintainable condition index (MCI) and required maintenance work are determined for each section, the next step is to find code for unit cost. Apart from MCI and maintenance type (periodic, routine etc.), other factors for unit cost code are *district location*, *road class and surface type.* Remember that if the value of maintenance is within 2.5 (by default), cost of maintenance is determined on the basis of maintainable condition index band (see figure-17: Page-D of Lookup Table).

Ranking of roads are done on the basis of total cost of works total number of population in different sub-county who preferred the road (loosely speaking, number of people served by the road). Thus person cost (**PC**) of a road is total maintenance cost of the road (all types of maintenance including routine, periodic, bottleneck etc.) divided by sub-county population against the road. Lower the person cost (PC) of a road, higher will be cost-effectiveness to maintain the road and the road will get higher rank. While determining cost effectiveness, cost of periodic maintenance is taken yearly basis. That means, if a road section is due for periodic maintenance in the present year, its yearly periodic maintenance cost is equal to total periodic maintenance cost divided by periodic maintenance interval. Otherwise, total cost of maintenance of the road will become high in compare to another road where periodic maintenance is not required in the current year (that is <u>periodic maintenance is due in the following year</u>). Thus because of concentrated periodic maintenance cost in a year (if the cost is not distributed over maintenance interval), the road will fall at the bottom of ranking. Subsequently if the road is excluded from current year's work plan, its condition will be worse in the next year and may require expensive rehabilitation. Another thing to remember that while preparing the ADRWP (discussed in the next section) you may select either "full-periodic" or "partial-periodic" maintenance intervention for a section. Based on this selection, calculation of yearly periodic maintenance cost is done (default is full-periodic maintenance). Thus if you change sub-type of periodic maintenance (full or partial) from yearly work plan of any section in the database - run the maintenance calculation again.
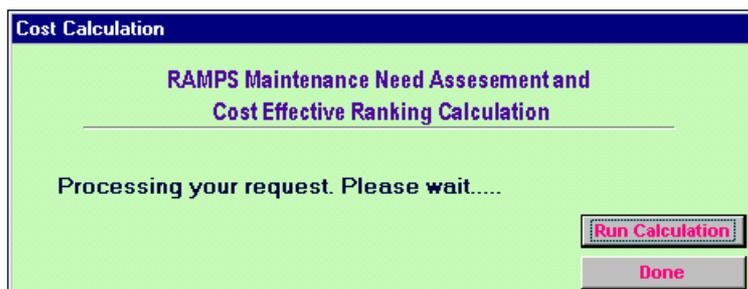
Fig-22: Popup dialogue box to perform calculation of cost of road works

Steps in RAMPS Procedures

ADRICS – Road Inventory (Form-A)
ADRICS – Structure Inventory (Form-B)
ADRICS – Road Condition Survey (Form-A)
ADRICS – Road Condition Survey (Form-B)

+ **Lookup Table Factors**

Determine Maintainable Condition Index

Maintainable Condition Index > 2.5 → **Rehabilitation**

Maintainable Condition Index <= 2.5

Check the Matrix for Periodic Maintenance Interval

Year of last re-gravel is within Periodic Maint. → **Routine Only**

Year of last re-gravel exceeds Maint Interval → **Periodic + Routine**

Whether there is any bottleneck on the road → **Bottleneck Repair**

Find group of unit cost with respect to maintenance type, road class, surface type and other LUT factors

+ **Unit Cost of Maintenance Items**

Calculate Maintenance Cost of each Section

Calculate Maintenance Cost of each Road

+ **Sub-County Road Preferences**

Rank roads as per cost effective advantage

Select road section under annual maintenance work plan and Apply maintenance interventions (Periodic/ Routine etc) on road section

Distribute funding sources to different roads and prepare Annual Work Plan

Fig-23: Steps in RAMPS Procedure

Maintenance cost calculation in RAMPS is done by pressing "Run Maintenance Cost Calculation" button of main switchboard. As you press the button, a popup window will appear in the screen as shown in figure-22. While processing calculation, progress of calculation will be displayed in the status bar. When calculation is finished, press "Done" button of the popup window to return to the main switchboard. By now you are ready to prepare annual work plan through browsing the sections.

14. Preparation of Annual District Road Work Plan (ADRWP)

As when you have done maintenance calculation, RAMPS assigned different types of maintenance costs (such as routine, periodic etc.) against each section of road in the database. If you had sufficient fund to maintain the whole road network, running maintenance cost calculation in RAMPS were sufficient exercise to get your ADRWP. Unfortunately there is always scarcity of fund and you have to make good choice for the road works. RAMPS assists you to make the annual district road work plan (**ADRWP**) through interactive selection of road sections and by choosing appropriate intervention <u>for a road as a whole or for its sections individually</u>.

To do the exercise, first open the road list using "*Select Road Sections/ Struc. Through Browsing the List*" button and then press on "Yr Plan – Rd Section" button to open the Road Section's ADRWP form (figure-24). This form consists of 14 columns and a number of command buttons to work with it. Following functions can be performed with the "<u>Annual Work Plan for All/ Individual Rd Sections</u>" AWP form.

> a) Assign maintenance intervention (periodic, routine etc.) to all or individual sections of a road, get road work cost for different sections and thus setup AWP of the road sections.
>
> b) Sum up AWP cost of road sections under different category of works (routine, periodic etc.) and then transfer them to road-wise records in AWP.
>
> c) Distribute the AWP cost of a road among different funding sources (PAF-1/2/3, donor etc.).

At the top right corner of the form (see figure-24), there are a number of small square buttons (6 by default) which have been labeled with different interventions of road works such as "Routine Only" etc. If you press any of theses buttons, all sections of the road will be

assigned with the corresponding intervention(s). However, assigning the intervention to the road sections (AWP) will not automatically transfer the work category-wise cost to the AWP of the road. Because AWP record of a road requires assignment of funding sources for different category of road works (i.e: routine, periodic etc.). Obviously the cost of different type of works for a road is sum of what is set for different sections of the road (see the footer in figure-24). To transfer the AWP of road sections to the AWP record of the road, finish assignment of interventions to different road section and then press "**Yr Plan Sumry**" button. A window titled "*Annual Work Plan – Allocation of Fund for Road Works*" will be popped up in the screen (see figure-25). As you got the popup window, press on the button "**Pick Yr Plan**" button in the window. This will transfer the cost of road works of different sections of the road (what you have worked out in the previous step) to the table of popup window. The

Fig-24: Preparation of Section-wise AWP of Road Works

cost is transferred to the popup window such a way that routine work cost of all road sections will go under "routine" column of the table, periodic work cost of all road sections will go under "periodic" column of the table and so on. Again the cost will be transferred to different default funding sources following the way you assigned district budget ceiling for different funding sources for different category of works. Remember that you setup district budget for different type of works (routine, periodic etc.) as per ceiling of fund under different funding sources (refer to *Funding Sources* page of LUT form, figure-19). For instance, say you have assigned UGX 150 million budget for PAF-3 against rehabilitation works. Now as you press "**Pick Yr Plan**" button in figure-25, any cost of the rehabilitation work will be placed under PAF-3. As you continue to transfer the section-wise AWP cost to road-wise AWP cost for different roads one by one (using "**Pick Yr Plan**" button), all the rehabilitation work cost will be placed under PAF-3 until the whole 150 million budget is exhausted. Now if you transfer cost for any next road after 150 million exhausted, the rehabilitation cost is

placed under "District Dev Fund" as you have 15 million shilling budget available for the rehabilitation works (see figure-19). If there was only single source of fund available for rehabilitation works (say only PAF-3), all cost transferred using "**Pick Yr Plan**" button (in figure-25) is assigned against PAF-3, even it exceeded 150 million shilling. However, you can always overrule the default distribution of the cost in the popup window (figure-25) following the rule that you keep total amount of cost under each category (routine, periodic etc.) same both for section-wise AWP cost (figure-24) and road-wise AWP cost (figure-25). For instance for a particular road, as worked in the section-wise AWP, you need UGX 79,200 thousand for rehabilitation works. If you assign this whole amount of money against PAF-3 (as per default distribution), it will exceed the budget ceiling of PAF-3 (which is UGX 150 million). You may notice that there is sufficient money left under PAF-3 budget (which is earmarked for periodic maintenance work, but for your case periodic maintenance requirement is limited). Now you can take UGX 70,000 thousand from PAF-3 cell and assign it against PAF-2 cell keeping total amount of rehabilitation cost unchanged (i.e. UGX 79,200 thousand, see figure-25). When you finish distribution of AWP cost of a road among different funding sources, press "**Save**" button to save the distribution (figure-25). The distribution can not be saved if the cost of works under different category (routine, periodic) remains different in section-wise AWP and road-wise AWP.

Funding Source	Routine	Periodic	Rehab	Rd. BNeck	St. BNeck	Total: This Rd	Total: All Rd	Dist Budget
PAF-1	11,026					11,026	86,486	100,000
PAF-2		36,960	70,000			106,960	106,960	120,000
PAF-3			9,200			9,200	141,200	150,000
District Dev Fund							10,419	15,000
Donor - DANIDA					185	185	395,620	350,000
Donor - USAID								
Donor - ADB								
Allocation on this Rd	11,026	36,960	79,200		185	127,371		
Allocation on All Rds	86,486	277,379	369,600		7,220		730,267	735,000

District: Pader — Annual Work Plan - Allocation of Fund for Road Works — All Figures are in '000 USh

Number of Road Taken up .... : 8
Length of Rd Section Taken up : 263.5 Km

Fig-25: Popup window for transferring road-section AWP to different funding sources

However, if you change your section-wise annual work plan after saving road-wise AWP and cost distribution, there will be a mismatch between section-wise AWP, road-wise AWP and distribution of cost among various funding sources. As such it is always recommended to transfer and redistribute cost of works (to funding sources) **whenever you change** section-wise AWP or run maintenance cost calculation.

As you assign maintenance intervention to the road section (single intervention or individual intervention to different road sections), cost of road works for each section will appear at the right most column in the form (see figure-24). Here you may notice that any particular

maintenance work (routine, periodic etc.) is effective for those sections, where that particular maintenance is required. For instance, if you press "Rehabilitation" button, rehabilitation will be effective for those sections whose rehabilitation cost has been assigned by RAMPS. If no section of the selected road requires "rehabilitation" and you pressed "Rehabilitation" button, total cost of maintenance for the road will be "zero" although many sections of the road may require other category of cost namely routine, periodic etc. At the footer of the form, you will see sum of different type maintenance cost for the road as per set work plan. For example, total cost of periodic maintenance of all sections of road (as set in the AWP) is shown under footer of column-8. Similarly, cost of all kind of works of all sections of the road is shown under the footer of column-14.

To assign any specific type maintenance work to individual section of the road, use the combo list at column-13 of the form. Remember that figures shown in column-7 to column-11 are the maintenance costs which have been calculated by the "Maintenance Cost Calculation" module. Another point to note that you can not assign or withdraw structure bottleneck cost from this form. Structure bottleneck selection is done by "Annual Plan for Structure Maintenance Work" form (**figure-26**). However, for the convenience in checking figures, cost of structure bottleneck is displayed under column-12 of section's ADRWP form.

Annual Plan of Structure Maintenance Work

Road Code: 5301
Road Name: Kalongo - Bulugi
District: Pader
CE Rank: 5
PC (USD): 13.980
[View Total Cost] [« Back]

Struct. No [i]	Type [ii]	Location (Chainage) (Km) [iii]	Bridges Only Num of Spans [iv]	Width [m] [v]	Length [m] [vi]	Culverts Only No of Openings [vii]	Size of Openings [viii]	Head Walls [ix]	Structure Condition [x]	Type of Bottleneck (if any) [xi]	BNeck Cost (T-USh) [xii]	Included in Year Plan [xiii]
001.	G- Concrete pipe culvert	0.000		8.00	0.60	1	0.60	No	Bad			No
002.	G- Concrete pipe culvert	0.100		6.00	0.60	1	0.60	No	Fair			No
003.	G- Concrete pipe culvert	1.400		6.00	0.60	1	0.60	No	Fair			No
004.	H- Steel pipe culvert	1.800		6.00	0.90	1	0.90	Yes	Good	104	79	Yes
005.	G- Concrete pipe culvert	2.250		6.00	0.60	1	0.60	No	Fair			No
006.	G- Concrete pipe culvert	3.800		6.00	0.60	1	0.60	No	Fair			No
007.	H- Steel pipe culvert	6.800		6.00	0.60	1	0.60	Yes	Fair			No
008.	H- Steel pipe culvert	6.805		6.00	3.60	4	0.90	Yes	Fair			No
009.	H- Steel pipe culvert	6.810		6.00	0.90	1	0.90	No	Fair			No
010.	H- Steel pipe culvert	6.840		6.00	1.20	1	1.20	Yes	Good	104	106	Yes
011.	H- Steel pipe culvert	12.900		6.00	0.90	1	0.90	Yes	Good			No
012.	H- Steel pipe culvert	13.600		6.00	0.90	1	0.90	Yes	Good			No
013.	H- Steel pipe culvert	17.000		6.00	0.90	1	0.90	Yes	Good			No
014.	G- Concrete pipe culvert	20.100		6.00	0.60	1	0.60	No	Fair			No
015.	Z- Unknown	21.900	1	0.60	6.00	0	0.00	No	Fair			No

Total (As per Year Plan) --------------------> 185

Record: [◄◄] [◄] 1 [►] [►►] [►*] of 15 (Filtered)

Fig-26: Preparation of AWP for Structure Works

Each time you run maintenance cost calculation, cost of maintenance for each section will be calculated accordingly. However, any previous exercise of road section will still be unchanged. That means, if you had set only routine maintenance intervention for a road section previously, next time you open road section AWP form you will see the same routine only intervention setting for that the sections, whereas cost of routine work may be changed because of running cost calculation module. So when you want to do a fresh work plan, it is

always better to initialize the work by assigning "All maintenance works" to the whole road length by pressing bottommost small button of the form labeled "**Ro + Pe + R.BNeck/ All**" – which will assign all interventions (viz. Routine, Periodic, Rehabilitation, Road Bottleneck etc.) to all sections of the road. Pressing "Reset Year Plan" button will remove all maintenance works from all sections of the road (except structure bottleneck) and annual maintenance cost for this road will become zero. Again, remember to transfer and redistribute cost of works (to funding sources) using popup window in figure-25 **whenever you change** section-wise AWP or run maintenance cost calculation.

15. Reports of RAMPS

There are 12 reports incorporated in the present version of RAMPS. To open any report, select the second last button in the main switchboard and open the form titled "Reports of RAMPS" (figure-27a,b). As you can see, there is a radio button at the left of each report name in this form. Select the radio button and press "Preview" button to open any report you like.
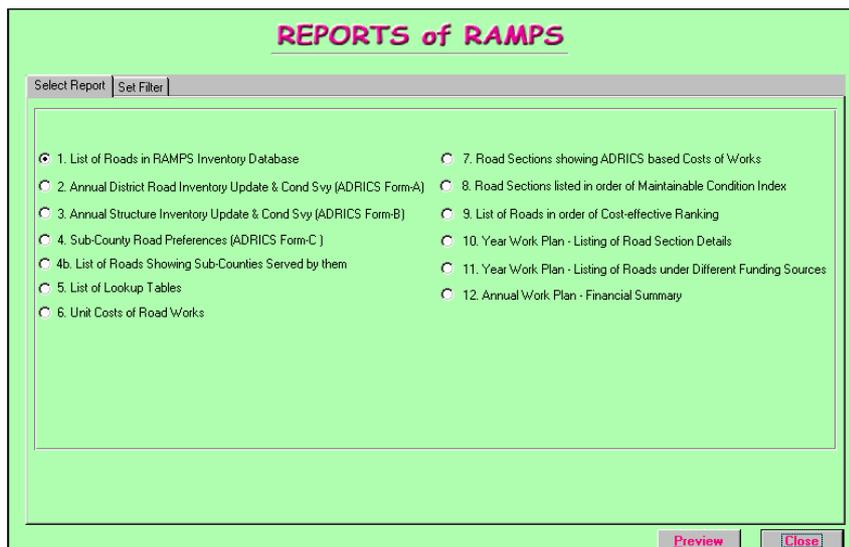
Fig-27a: List of Reports in RAMPS – Page 1

There are two pages in this form. The first page contains name of the reports and the second page contains a number of check-boxes to filter the data under a report. Name of the reports in the form have been arranged in the sequence of data processing flow chart in RAMPS. For instance the first step in RAMPS is to set up the inventory of roads and accordingly name of "List of Roads in RAMPS Inventory Database" report appears at the top of the list. Similarly final output in RAMPS is annual work plan and "Annual Work Plan - Financial Summary" report is placed at the last in the list.

If you have several district data in your database and for any specific purpose if you like to

print any particular district data, use the "set filter" page to achieve the work. For instance, to filter out Gulu district, check only northern region and then press **Apply** button at the bottom of region box. All districts in the region will be checked with tick mark. Now remove the tick from Gulu district and then press **Toggle** button at the bottom of District box**.**
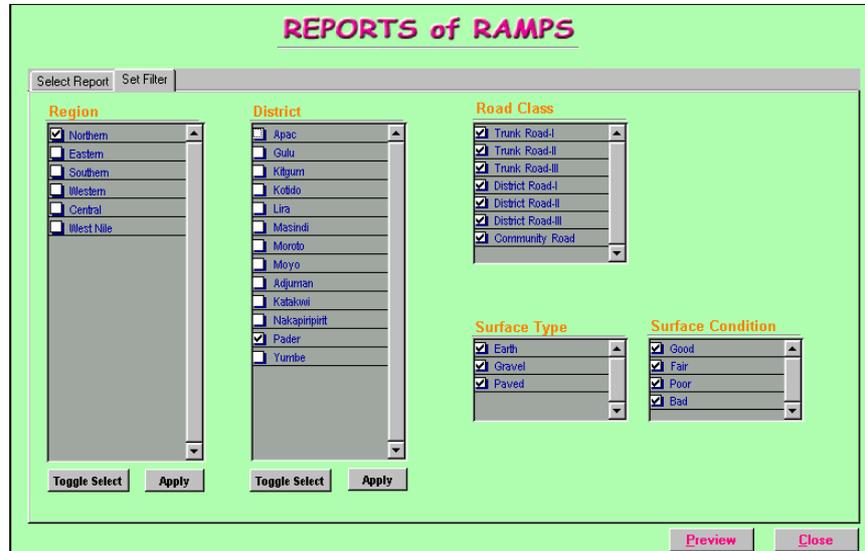
Fig-27b: List of Reports in RAMPS – Page 2

Sample reports have been shown in the annexure of this document. Some of those reports need brief descriptions which are stated as follows:

Annexure-B1: List of Roads in RAMPS Inventory Database
There are 13 columns in this report. Data in columns 5 to 12 are coming from structure table of the database. For each road numbers of good condition bridges and their length have been listed in the column 5 and 6 respectively. Total number of fair, poor and bad (written shortly as F/P/Bad) bridges and their length have been listed in the column 7 and 8 respectively. There is a sub-total after each road class in the list and road in each class are arranged in order of the road code. From this report, you can get overall scenario of the road network in the district.

Annexure-B2: ADRICS Form-A
This report produces the entries of ADRICS road condition survey data (Form-A) of the road network. Use this report to check and correct the entries in compare to your survey sheet.

Annexure-B3: ADRICS Form-B
Use this report to check and correct the entries in your ADRICS Form-B comparing your survey sheets. In addition to ADRICS form-B data, this report also includes structure bottleneck entries and information about annual work-plan of structures bottleneck (column-xii and x-iii).

Annexure-B4: Sub-County Road Preferences (ADRICS Form-C)

This report represents form-C of ADRICS. In a single page, multiple sub-counties data are accommodated in the report layout. In addition to Form-C data, two additional columns (namely "*SC population using the road*" and "*Population served by the road*") have been incorporated in the report. The first column represents portion of population preferred the road, which is equal to total number of people in the sub-county divided by number of roads listed under the sub-county. The last column represents total number of people from different sub-counties preferred the road.

Annexure-B6: Unit Cost of Road Works

This report provides Unit Cost of maintenance work items. In this report, only those reports are included for which a maintenance cost has been stored in the database. That means, there might be many work items created in the database. However, only those items (from all those created items) will be displayed in the report, for which a cost value has been assigned.

Annexure-B7: Road Sections showing ADRICS based cost of Works

This report shows section-wise calculation of various maintenance costs such as routine, periodic, rehabilitation etc. Browse this report to check whether the maintenance cost figures appeared in column-10-15 is acceptable or there is any abnormality in the figures. *Maintainable status* could be either of three categories: "*Maintainable*", "*Not-Maintainable*" or "*Unknown*". If you find "Unknown" maintainable status or any abnormality in maintenance cost figures, go back to ADRICS survey report (Form-A, B and C) and make necessary corrections of the corresponding road and make necessary corrections.

Annexure-B9: List of Roads in order of Cost-effective Ranking

List of roads in a district are in order of cost-effective ranking in this report. The ranking is done separately for road class (i.e. one group of ranking for District Road Class-I, another group for District Road Class-II etc) – roads of different classes are not mixed together.

One important thing to check from this report is to see whether there is any section length under "unknown" maintainable status (column-5). For any correct data set, length of road under column-5 should be '0'. If you find any value (other than '0') under this column, review the ADRICS data of the corresponding road, correct the entries and repeat the exercise. Remember that if you have not specified "year of last resurfacing" value for a section, RAMPS will continue calculation of the section assuming that "re-surfacing" age is so old that it is not known. In this case, "maintainable status" is flagged as "unknown" and road section is included under periodic maintenance.

Annexure-B10: Year Work Plan – Listing of Road Section Details

Use this report to verify your annual work-plan data – i.e. section-wise "year-plan" entries. As you know that you can assign invariably a single maintenance intervention to the whole length of the road or you can assign different maintenance interventions to different road sections individually. Column-13 of the report represents the maintenance work assigned against different sections under the work-plan. Column-7 to 11 show cost of maintenance work of each road section as calculated by "cost calculation module of RAMPS". Whereas column14 represents the cost as earmarked for the section in the annual work-plan for the maintenance work assigned in column-13.

Annexure-B11: Year Work Plan – Listing of Roads under Different Funding Sources

This report represents funding source-wise listing of roads. For each funding source, a separate list is prepared and if maintenance work of a road is allotted under different funding sources (for different sections), the same road name will obviously appear multiple times in the corresponding funding source name. Figures under columns 7-10 represents various maintenance costs as earmarked for the road from the given funding source. The figures within the brackets represent total maintenance cost of the road as allotted from various funding sources. For instance, if the figures under column-7 for a road are 5,000 and 7,000 (outside and within brackets respectively), then it will be understood that cost of periodic maintenance of the road allotted from the given "funding-source" is 5,000 and total periodic maintenance cost of the road as taken up in the annual work-plan is 7,000.

Annexure-B12: Annual Work Plan – Financial Summary

This report lists donor-wise distribution of various maintenance costs (routine, periodic etc.) under a district as per annual work-plan in a matrix form. This represents an overall scenario of annual work-plan of maintenance works in a concise form.

16. Data Export/ Import Operation

Data export/ import module in RAMPS assists to maintain a uniform database structure of road inventory and other information in RAMPS in different districts and at the same time ministry can establish a central database with the possibility of regular update without entering huge data by themselves. On the other hand, as same data is remains both in the districts and in the ministry, it eliminates unnecessary confusion for the version of data. Moreover, there are some lookup tables (such as list of funding sources), which are maintained at the central place so that the coding of the lookup tables (LUT) remains uniform through out all districts even when a new entry is given to a LUT. For instance, same code for "District Dev Fund" is used in all offices that use RAMPS.

Fig-28: Forms to Select Data Export or Import Operation

To export data to any file, open the Data Export form as shown in figure-29 (to open Data Export Form, you have to come through another small switchboard as shown in figure-28). Then set the district list for which you want to export the data. In the **Destination** box of the
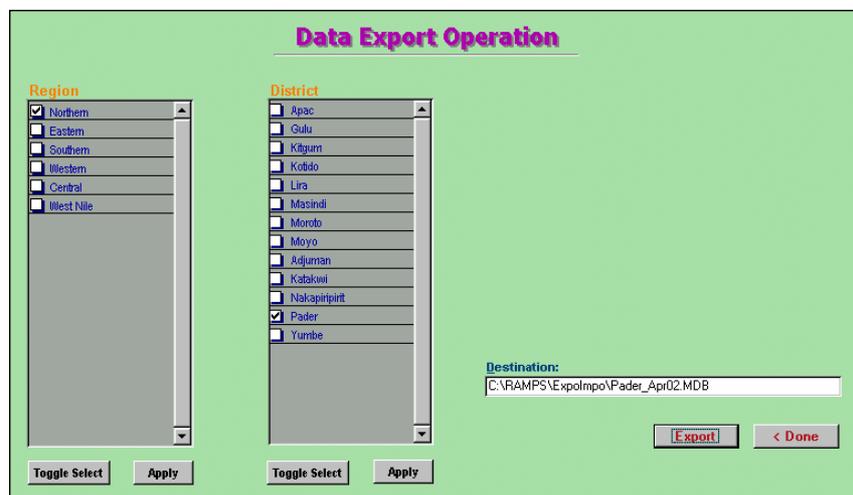
Fig-29: Data Export Form

form, enter name of the file with detail pathname (i.e. including folder names) into which you want to export the data; refer figure-29. It is also possible to export data directly into a floppy diskette; however, we recommend to export data into a file under the default folder called C:\RAMPS\ExpoImpo. Remember that RAMPS export data in MS Access format and remember to put default extension .MDB to the name of the file. Also you can provide

meaningful name to the files so that when all files are obtained in the Ministry, they can be distinguished.

Once the data is exported into a file, now you can copy it into a floppy to send it to ministry. Use Windows Explorer to copy the file from C:\RAMPS\ExpoImpo to the floppy. When you export data, generally following data are downloaded into the destination file:

> i) Road List
>
> ii) Structure List
>
> iii) Sub-County List and SC Preferences
>
> iv) Calculated Cost of Road Works
>
> v) Annual Work Plan
>
> vi) District Budget
>
> vii) Unit Cost for Selected Districts

Usually data **Import** operation is used in the ministry to upload the data obtained from the districts into ministry database. To perform the import operation, first copy the **source file** (which you obtained from the district) under the folder C:\RAMPS\ExpoImpo. Now open Data Import Form as shown in figure-30.
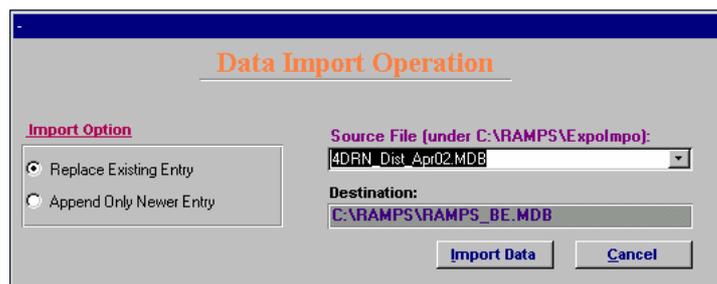
Fig-30: Data Import Form

In the data import form, click on the drop-down box labeled "**Source File (under C:\RAMPS\ExpoImpo):**" Under the drop-down box, you will find list of .MDB files stored under C;\RAMPS\ExpoImpo. Select the appropriate file from the list. As you select the file, the "Import Data" button in the form is enabled. As you press on "Import Data" button, a window as shown in figure-31 is popped up.

The popped up Windows displays the comparative statement between the entries in the existing database (i.e. what is at present in the ministry computer) and that in the external database (i.e. what you obtained from the district). You might have many district's entry in the existing database, but the popup window will display only those districts for which data is available in external database. If you are satisfied with the statement displayed in the popup

window, press "**confirm**" button to proceed with the operation. As you press "Confirm" button, the popup window is disappeared and "Import Data" button in the Data Import form is replaced by "**Proceed**" button (see figure-32). Now you notice that there are two radio buttons at the left of data import form and by default "Replace Existing Entry" is selected.

Fig-31: Popup Window Showing Comparative Statement of Records

If you keep "Replace Existing Entry", all data <u>for the selected districts only</u> (figure-31) in the existing database will be replaced by the data that available in the external database. If you select "Append Only Newer Entry", only the new road(s) or new section(s) of the selected

Fig-32: Data Import Form after Confirm button is pressed

districts found in the external database are merged into the existing database. Whether an entry (say a record of road) in the external database is new or it is already common with existing database that is checked by RAMPS using the internal ID of the entry.

ANNEXURES

Table Relationship Diagram of RAMPS

RoadList
- InternalRdID
- RoadCode
- DistrictCode
- RdClass
- RoadName
- RdLength
- Width
- NoOfBridge
- NoOfCulvert
- PopServed
- RdListDateEdit
- RdSecDateEdit
- StructDateEdit
- RoutineMaintCost
- PeriodicMaintCost
- RehabilitationCost
- RoadBNeckCost
- StrucBNeckCost
- YearlyMaintCost
- CostPerPerson
- CP_Rank
- Remarks

LUT-RoadClassification
- ClassCode
- ClassName
- ClassFactor
- RoadWidth

LUT-StructureCondition
- ClassCode
- ClassName
- ClassFactor

StructureList
- InternalStID
- InternalRdID
- StructureNum
- BC_Category
- StructureType
- ChainageKm
- SpansNum
- Width
- Length
- OpeningsNum
- OpeningsSize
- HeadWalls
- StrCondition
- BottleNeckType
- IncludedInWPlan
- StrucBNeckCost
- Comments

RdSectionInventory
- RdSectionID
- InternalRdID
- SecNum
- Start_Chainage
- End_Chainage
- SecLength
- SurfaceType
- SurfaceYear
- SurfMatType
- MatProximity
- TrafficGroup
- DrainCond_L
- DrainCond_R
- ShoulderCond_L
- ShoulderCond_R
- SurfaceCond
- BottleNecks
- BottleNeckType
- BottleneckSize
- MaintCondIndex
- MaintStatus
- RoutineMaintCost
- PeriodicMaintCost
- PeriodicPartCost
- PeriodicMCostYrly
- RehabilitationCost
- RoadBNeckCost
- StrucBNeckCost
- StrucBNeckCost_WP
- PlannedWork
- WorkPlanCost
- PopulationServed
- Remarks
- FundingSource

LUT-BridgeCulvTypes

LUT-SurfaceTypes

LUT-SurfMaterialFactor

LUT-MaterialProximity

LUT-TrafficGroups

LUT-DrainageCondition

LUT-ShoulderCondition

LUT-SurfaceCondition

LUT-MaintTypeForWPlan
- Code
- CodeDisplay
- WorkDescription

SC_RdPreferences
- PreferenceID
- SC_Code
- RoadCode
- InternalRdID
- SC_Preference
- SharedRdPop_inSC
- PopServedbyARoad
- Comments

SubCountyList
- SC_Code
- DistrictCode
- SC_Name
- Population
- PopSource
- PopDate
- Area
- AreaSource
- AreaDate
- DataCollectedBy
- DataCollectDate
- ExpImpSel

Districts
- DistrictCode
- RegionID
- DistrictName
- ExpImpSel

UnitCost
- CostCode
- RoadClassCode
- SurfaceTypeCode
- TopoZoneCode
- WorkCode
- MaintCost

Regions
- RegionID
- RegionName
- ExpImpSel

LUT-TopographicZone
- ClassCode
- ClassName
- Description
- ClassFactor

LUT-TypeOfWork
- WorkCode
- WorkDescription
- WorkCategory
- MeasurementUnit
- MaintCost

LUT-MaintenanceType
- Code
- Description

RoadFundDetail
- ID
- InternalRdID
- FundingSource
- RoutineMaintCost
- PeriodicMaintCost
- RehabilitationCost
- RoadBNeckCost
- StrucBNeckCost
- WorkPlanCost

SystemSettings
- ID
- PropertyCode
- PropertyValue

LUT-FundingSources
- Code
- Name
- CodeDisplay
- RoutineMaintCost
- PeriodicMaintCost
- RehabilitationCost
- RoadBNeckCost
- StrucBNeckCost

Annexure-B1

REHABILITATION AND MAINTENANCE PLANNING SYSTEM
LIST OF ROADS IN RAMPS INVENTORY DATABASE (WITH STRUCTURE SUMMARY)

District: Pader

Road Class	Road Code	Road Name	Length (Km)	Bridge Information				Culvert Information				Remarks
				Good Condition		F/ P/ Bad Cond		Good Condition		F/ P/ Bad Cond		
				No	Length (m)	No	Length (m)	No	Length (m)	No	Length (m)	
1	2	3	4	5	6	7	8	9	10	11	12	13
District Road-I	5301	Kalongo - Bulugi	32.70	0	0.0	0	0.0	5	4.8	9	8.7	
	5302	Kalongo - Odokomit	54.00	1	7.0	3	19.1	18	17.9	16	14.7	
	5303	Kalongo - Longoa	38.20	0	0.0	0	0.0	5	7.2	11	8.5	
	5306	Pajule - Pader - Ladinge	27.80	1	27.0	0	0.0	11	7.2	1	0.9	
	5309	Adilang - Paimol	38.00	1	6.0	0	0.0	2	2.4	13	7.7	
	5313	Refugee Camp - Arum	16.00	0	0.0	0	0.0	4	2.4	8	5.4	
	5314	Aculu - Puranga	46.00	1	6.0	0	0.0	0	0.0	14	9.8	
	5317	Adilang - Lacekoto	11.00	0	0.0	1	6.0	1	0.6	1	0.6	
Sub-Total (of Road Class) : 8 Nos Road			263.70	4	46.0	4	25.1	46	42.5	73	56.3	

ADRICS Form-A

REHABILITATION AND MAINTENANCE PLANNING SYSTEM (RAMPS)
ANNUAL DISTRICT ROAD INVENTORY UPDATE & CONDITION SURVEY (ADRICS Form-A)

District: Pader

Road Code: 5301
Road Name: Kalongo - Bulugi

Num	Start Km	End Km	Section Length	Surface Type	Year Last Surfaced	Surface Material Factor	Material Proximity Factor	Traffic Group	Drainage Cond Factor Left	Drainage Cond Factor Right	Shoulder Cond Factor Left	Shoulder Cond Factor Right	Surface Condition Factor	Road Bottleneck B.Neck Type	Road Bottleneck Size (m)	Comments
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)	(xiii)	(xiv)	(xv)	(xvi)	(xvii)
01	0.00	2.20	2.20	1	1995	2	1	1	3	3	3	3	2			Section Require Reshaping
02	2.20	3.00	.80	2	1995	2	2	1						Embankment Filling	100	
03	3.00	6.80	3.80	2	1995	1	1	1	3	3	3	3	3			
04	6.80	8.00	1.20	2	1995	1	1	1	1	1	1	1	1			
05	8.00	11.00	3.00	1	1996	1	1	1	3	3	3	3	3			
06	11.00	15.00	4.00	2	1996	1	1	1	2	2	2	2	2			Section Require Reshaping
07	15.00	16.00	1.00	2	1996	1	1	1	2	2	2	2	3			Section Require Reshaping
08	16.00	17.50	1.50	2	1996	1	1	1	2	2	2	2	2			
09	17.50	19.30	1.80	1	1999	1	1	1	2	2	2	2	2			Section Require Reshaping
10	19.30	23.80	4.50	2	1999	1	1	1	2	2	2	2	3			
11	23.80	24.50	.70	1	1999	1	1	1	3	3	3	3	3			
12	24.50	25.60	1.10	2	1999	1	1	1	3	3	3	3	2			
13	25.60	28.00	2.40	1	1999	1	1	1	2	2	2	2	2			
14	28.00	31.00	3.00	2	1999	1	1	1	3	3	3	3	3			
15	31.00	32.70	1.70	2	1999	1	1	1	2	2	2	2	2			

Road Code: 5302
Road Name: Kalongo - Odokomit

Num	Start Km	End Km	Section Length	Surface Type	Year Last Surfaced	Surface Material Factor	Material Proximity Factor	Traffic Group	Drainage Cond Factor Left	Drainage Cond Factor Right	Shoulder Cond Factor Left	Shoulder Cond Factor Right	Surface Condition Factor	Road Bottleneck B.Neck Type	Road Bottleneck Size (m)	Comments
01	0.00	2.10	2.10	1	1997	3	3	3	3	3	3	3	3			
02	2.10	2.70	.60	1	1997	2	2	2	2	2	2	2	2			
03	2.70	4.80	2.10	1	1997	1	1	1	1	1	1	1	1			
04	4.80	6.40	1.60	1	1996	2	1	2	2	2	2	2	2			
05	6.40	33.40	27.00	1	1996	1	1	2	1	1	1	1	1			
06	33.40	54.00	20.60	1	2000	1	1	2	1	1	1	1	2			

Annexure-B3

District Pader

REHABILITATION AND MAINTENANCE PLANNING SYSTEM (RAMPS)
ANNUAL STRUCTURE INVENTORY UPDATE & CONDITION SURVEY (ADRICS Form-B)

ADRICS Form-B

Struct. No	Type	Location (Chainage) (Km)	Num of Bridge Spans	Width (m)	Length (m)	Culverts Only		Head Walls	Structure Condition	Structure Bottleneck (if any)			Details of Work to be Done / Comments
						No of Openings	Size of Openings			Type of Bottleneck	Cost (USD)	Included in Work Plan	
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)	(xi)	(xii)	(xiii)	(xiv)

Road Code: 5301
Road Name: Kalongo - Bulugi

Struct. No	Type	Location (Chainage) (Km)	Num of Bridge Spans	Width (m)	Length (m)	No of Openings	Size of Openings	Head Walls	Structure Condition	Type of Bottleneck	Cost (USD)	Included in Work Plan	Details of Work to be Done / Comments
001.	G- Concrete pipe culvert	0.00		8.00	0.60	1	0.60	No	4			-	Re-install
002.	G- Concrete pipe culvert	0.10		6.00	0.60	1	0.60	No	2			-	
003.	G- Concrete pipe culvert	1.40		6.00	0.60	1	0.60	No	2			-	
004.	H- Steel pipe culvert	1.80		6.00	0.90	1	0.90	Yes	1	Culvert Repair	79	Yes	
005.	G- Concrete pipe culvert	2.25		6.00	0.60	1	0.60	No	2			-	
006.	G- Concrete pipe culvert	3.80		6.00	0.60	1	0.60	No	2			-	
007.	H- Steel pipe culvert	6.80		6.00	0.60	1	0.60	Yes	2			-	
008.	H- Steel pipe culvert	6.80		6.00	3.60	4	0.90	Yes	2			-	
009.	H- Steel pipe culvert	6.81		6.00	0.90	1	0.90	No	2			-	
010.	H- Steel pipe culvert	6.84		6.00	1.20	1	1.20	Yes	1	Culvert Repair	106	Yes	
011.	H- Steel pipe culvert	12.90		6.00	0.90	1	0.90	Yes	1			-	
012.	H- Steel pipe culvert	13.60		6.00	0.90	1	0.90	Yes	1			-	
013.	H- Steel pipe culvert	17.00		6.00	0.90	1	0.90	Yes	1			-	
014.	G- Concrete pipe culvert	20.10		6.00	0.60	1	0.60	No	2			-	
015.	Z- Unknown	21.90	1	0.60	6.00	0	0.00	No	2			-	

Road Code: 5302
Road Name: Kalongo - Odokomit

Struct. No	Type	Location (Chainage) (Km)	Num of Bridge Spans	Width (m)	Length (m)	No of Openings	Size of Openings	Head Walls	Structure Condition	Type of Bottleneck	Cost (USD)	Included in Work Plan	Details of Work to be Done / Comments
001.	G- Concrete pipe culvert	1.90		6.00	0.60	1	0.60	No	2			-	Minor repairs
002.	H- Steel pipe culvert	1.91		6.00	0.90	1	0.90	No	2			-	Minor repairs
003.	G- Concrete pipe culvert	1.91		6.00	0.60	1	0.60	No	2			-	Minor repairs
004.	A- R/C Bridge	3.60	2	4.00	7.00			Yes	1			-	Minor repairs
005.	G- Concrete pipe culvert	8.10		6.00	0.60	1	0.60	No		Culvert New	158	Yes	
006.	H- Steel pipe culvert	9.00		6.00	0.90	2	0.45	No	2			-	Minor repairs
007.	G- Concrete pipe culvert	9.01		6.00	0.45	1	0.45	No	2			-	Minor repairs
008.	G- Concrete pipe culvert	9.10		6.00	0.60	1	0.60	Yes		Culvert New	158	Yes	
009.	H- Steel pipe culvert	9.90		6.00	7.20	6	1.20	Yes	1			-	
010.	G- Concrete pipe culvert	9.92		6.00	0.60	1	0.60	No	2			-	Minor repairs
011.	H- Steel pipe culvert	10.80		6.00	0.45	1	0.45	No	2	Culvert New	119	Yes	

REHABILITATION AND MAINTENANCE PLANNING SYATEM
Sub-Countiy Road Preferences (Form-C)

District Pader

RAMPS Form-C

Sub-County: Paimol	**District:**	Pader
Collected By: Ocitti Christopher	**Date:**	15/06/2001
Sub-County Population: 30,299	**Source:** Subcounty	**Date:** Nov/2000
Sub-County Area (Sq Km): 1,114	**Source:** Subcounty	**Date:** Nov/2000

List of District Roads used by the sub-county in order of their priority

Preference Number	Road Code	Road Name	Road Length	SC population using the road	Popul served by the road
01.	5303	Kalongo - Longoa	38.20	10,100	20,767
02.	5309	Adilang - Paimol	38.00	10,100	36,566
03.	5302	Kalongo - Odokomit	54.00	10,100	65,514

RAMPS Form-C

Sub-County: Pajule	**District:**	Pader
Collected By: Ocitti Christopher	**Date:**	08/06/2001
Sub-County Population: 26,111	**Source:** Subcounty	**Date:** Oct/2000
Sub-County Area (Sq Km):	**Source:**	**Date:**

List of District Roads used by the sub-county in order of their priority

Preference Number	Road Code	Road Name	Road Length	SC population using the road	Popul served by the road
01.	5306	Pajule - Pader - Ladinge	27.80	26,111	55,000

RAMPS Form-C

Sub-County: Parabongo	**District:**	Pader
Collected By: Ocitti Christopher	**Date:**	14/06/2001
Sub-County Population: 32,000	**Source:** Subcounty	**Date:** Feb/2001
Sub-County Area (Sq Km): 792	**Source:** Subcounty	**Date:** Feb/2001

List of District Roads used by the sub-county in order of their priority

Preference Number	Road Code	Road Name	Road Length	SC population using the road	Popul served by the road
01.	5301	Kalongo - Bulugi	32.70	10,667	28,861
02.	5303	Kalongo - Longoa	38.20	10,667	20,767
03.	5302	Kalongo - Odokomit	54.00	10,667	65,514

Lookup Tables of RAMPS

1.Road Classification

Code	Road Class Name	Factor
1	Trunk Road-I	1.00
2	Trunk Road-II	2.00
3	Trunk Road-III	3.00
4	District Road-I	4.00
5	District Road-II	5.00
6	District Road-II	6.00
7	Community Road	0.00

2.Surface Types

Code	Surface Type Nam	Factor
1	Earth	3.00
2	Gravel	2.00
3	Paved	1.00

3.Traffic Group

Code	Traffic Grou	AADT	Class Factor
1	V.Light	< 20 veh/day	1.00
2	Light	20 - 30 veh/	2.00
3	Medium	30 - 40 veh/	3.00
4	Heavy	> 40 veh/day	4.00

4.Performance of Surfacing Material

Code	Name	Performance Description	Facto
1	Good	Surface wears steadily	1.00
2	Fair	Surface wears quickly	2.00
3	Poor	Surface damages steadily	3.00

5.Proximity of Resurfacing Materials

Code	Proximity Nam	Proximity Descrip	Factor
1	Near	Haul 0 - 5 kms	1.00
2	Averag	Haul 5 - 10 kms	2.00
3	Far	Haul > 10 kms	3.00

6.Road Drainage Condition

Code	Name	Description	Facto
1	Good	No water on the road during r	1.00
2	Fair	Some water on the road during	2.00
3	Poor	Much water on the road during	3.00
4	Bad	Non existing/ non functioning	4.00

7.Road Shoulder Condition

Code	Name	Description	Facto
1	Good	Good shape, allowing easy runoff	1.00
2	Fair	Uneven shape, but allowing most w	2.00
3	Poor	Poor shape and seriously restrict	3.00
4	Bad	Non functioning or non existing	4.00

8.Road Surface Condition

Code	Name	Description	Facto
1	Good	Roughness: <8 m/Km; good shape, s	1.00
2	Fair	Roughness: 9-14 m/Km; reasonable	2.00
3	Poor	Roughness: 15-18 m/Km; poor shape	3.00
4	Bad	Roughness: >18 m/Km; bad shape, d	4.00

9.Topographical Zone

Code	Zone Name	Zone Descriptio	Factor
1	Flat	< 25 m / km	1.00
2	Rolling	27 - 100 m / km	2.00
3	Hilly	100 - 300 m / k	3.00
4	Mountainous	>300m /km	4.00

Lookup Tables of RAMPS

Weight factor to different Lookup Tables

Maintainable Condition Index

Road surface condit	40.0(
Road shoulder condi	20.0(
Road drainage condi	40.0(

Total: **100.00**

Cut-off value of "Maintainable Condition Index" for r   2.5(
(Upto which the road section is maintainable)

Unit Costs of Road Works

District: Pader

Category of Work	Work Code	Description of Work	Unit of measurement	Unit Cost	
				US$/ Unit/ Year	'000 USh/Unit/Yr
RoadClass: District Road-I					
Surface Type: Gravel					
Routine	01.	Routine Maint: Condition Factor Band-1 (> 0 - 1.5)	/Km	250	440
	02.	Routine Maint; Condition Factor Band-2 (>1.5 - 2.0)	/Km	300	528
	03.	Routine Maint; Condition Factor Band-3 (>2.0 - 2.5)	/Km	350	616
	04.	Routine Maint; Condition Factor Band-4 (reserved)	/Km		
Periodic	05.	Periodic Maintenance- Full	/Km	5,000	8,800
	06.	Periodic Maintenance- Partial	/Km	3,700	6,512
	10.	Spot Repair	/Km	5,000	8,800
Emergency Maint.	07.	Emergency Maintenance	/Km	400	704
Rehabilitation	09.	Rehabilitation- Full	/Km	15,000	26,400
Bottleneck- Road	08.	Embankment Filling	/Km	100	176
Bottleneck- Struct.	101.	Bridge New	/meter	3,400	5,984
	102.	Bridge Repair	/meter	250	440
	103.	Culvert New	/meter	150	264
	104.	Culvert Repair	/meter	50	88
	105.	Drifts New	/meter	250	440
	106.	Vented Drift New	/meter	1,800	3,168

Annexure-B7

REHABILITATION AND MAINTENANCE PLANNING SYSTEM
ROAD SECTIONS SHOWING ADRICS BASED COSTS OF WORKS

District **Pader**

Road Number	Road Name	Road Section				Maint Cond Index	Maintainable Status	Year of Last ReSurf	Maintenance Cost ('000 USh)					
		Num	Start Km	End Km	Length				Routine	Periodic	Rehab	R.BNeck	S.BNeck	Total
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Road Class: District Road-I

Road Number	Road Name	Num	Start Km	End Km	Length	Maint Cond Index	Maintainable Status	Year of Last ReSurf	Routine	Periodic	Rehab	R.BNeck	S.BNeck	Total
5301	Kalongo - Bulugi	01.	0.00	2.20	2.20	2.200	Maintainable	1995	1,355	19,360			79	20,794
		02.	2.20	3.00	0.80	1.200	Unknown	1995	352	7,040		17,600		24,992
		03.	3.00	6.80	3.80	3.000	Not-Maintainable	1995			100,320			100,320
		04.	6.80	8.00	1.20	1.000	Maintainable	1995	528	10,560			106	11,194
		05.	8.00	11.00	3.00	3.000	Not-Maintainable	1996			79,200			79,200
		06.	11.00	15.00	4.00	2.000	Maintainable	1996	2,112					2,112
		07.	15.00	16.00	1.00	2.600	Not-Maintainable	1996			26,400			26,400
		08.	16.00	17.50	1.50	2.000	Maintainable	1996	792					792
		09.	17.50	19.30	1.80	2.000	Maintainable	1999	950					950
		10.	19.30	23.80	4.50	2.400	Maintainable	1999	2,772					2,772
		11.	23.80	24.50	0.70	3.000	Not-Maintainable	1999			18,480			18,480
		12.	24.50	25.60	1.10	2.600	Not-Maintainable	1999			29,040			29,040
		13.	25.60	28.00	2.40	2.000	Maintainable	1999	1,267					1,267
		14.	28.00	31.00	3.00	3.000	Not-Maintainable	1999			79,200			79,200
		15.	31.00	32.70	1.70	2.000	Maintainable	1999	898					898
Sub-Total					32.70				11,026	36,960	332,640	17,600	185	398,411
5302	Kalongo - Odokomit	01.	0.00	2.10	2.10	3.000	Not-Maintainable	1997			55,440			55,440
		02.	2.10	2.70	0.60	2.000	Maintainable	1997	317					317
		03.	2.70	4.80	2.10	1.000	Maintainable	1997	924					924
		04.	4.80	6.40	1.60	2.000	Maintainable	1996	845	14,080				14,925
		05.	6.40	33.40	27.00	1.000	Maintainable	1996	11,880	237,600			673	250,153
		06.	33.40	54.00	20.60	1.400	Maintainable	2000	9,064				158	9,222
Sub-Total					54.00				23,030	251,680	55,440		832	330,981
5303	Kalongo - Longoa	01.	0.00	4.50	4.50	1.000	Maintainable	2000	1,980					1,980
		02.	4.50	7.10	2.60	1.000	Maintainable	2000	1,144					1,144
		03.	7.10	7.90	0.80	1.000	Maintainable	2000	352					352
		04.	7.90	9.20	1.30	1.000	Maintainable	2000	572					572
		05.	9.20	11.30	2.10	1.000	Maintainable	2000	924				238	1,162
		06.	11.30	12.70	1.40	1.000	Maintainable	2000	616					616

REHABILITATION AND MAINTENANCE PLANNING SYSTEM
ROAD SECTIONS LISTED IN ORDER OF MAINTAINABLE CONDITION INDEX

DistrictPader

Road Number	Road Section				Maint Cond Index	Maintenance Cost ('000 USh)					
	Num	Start Km	End Km	Length		Routine	Periodic	Rehab	R.BNeck	S.BNeck	Total
1	2	3	4	5	6	7	8	9	10	11	12

Road Class: District Road-I

Road Number	Num	Start Km	End Km	Length	Index	Routine	Periodic	Rehab	R.BNeck	S.BNeck	Total
5301	04.	6.80	8.00	1.20	1.000	528	10,560			106	11,194
5302	03.	2.70	4.80	2.10	1.000	924					924
	05.	6.40	33.40	27.00	1.000	11,880	237,600			673	250,153
5303	01.	0.00	4.50	4.50	1.000	1,980					1,980
	02.	4.50	7.10	2.60	1.000	1,144					1,144
	03.	7.10	7.90	0.80	1.000	352					352
	04.	7.90	9.20	1.30	1.000	572					572
	05.	9.20	11.30	2.10	1.000	924				238	1,162
	06.	11.30	12.70	1.40	1.000	616					616
	07.	12.70	14.50	1.80	1.000	792				158	950
	08.	14.50	15.00	0.50	1.000	220					220
	09.	15.00	17.00	2.00	1.000	880					880
	10.	17.00	17.20	0.20	1.000	88					88
	11.	17.20	19.10	1.90	1.000	836					836
	12.	19.10	23.70	4.60	1.000	2,024				238	2,262
	14.	24.20	35.00	10.80	1.000	4,752				713	5,465
	15.	35.00	38.20	3.20	1.000	1,408					1,408
5306	01.	0.00	8.00	8.00	1.000	3,520					3,520
	03.	14.00	27.80	13.80	1.000	6,072				238	6,310
5314	01.	0.00	11.00	11.00	1.000	4,840				792	5,632
	02.	11.00	26.90	15.90	1.000	6,996				158	7,154
	03.	26.90	46.00	19.10	1.000	8,404					8,404
5301	02.	2.20	3.00	0.80	1.200	352	7,040		17,600		24,992
5302	06.	33.40	54.00	20.60	1.400	9,064				158	9,222
5309	06.	8.00	10.50	2.50	1.400	1,100					1,100
5301	06.	11.00	15.00	4.00	2.000	2,112					2,112
	08.	16.00	17.50	1.50	2.000	792					792
	09.	17.50	19.30	1.80	2.000	950					950
	13.	25.60	28.00	2.40	2.000	1,267					1,267
	15.	31.00	32.70	1.70	2.000	898					898
5302	02.	2.10	2.70	0.60	2.000	317					317
	04.	4.80	6.40	1.60	2.000	845	14,080				14,925
5309	04.	0.00	2.40	2.40	2.000	1,267					1,267
	07.	10.50	13.40	2.90	2.000	1,531					1,531
5313	01.	0.00	4.00	4.00	2.000	2,112					2,112
5301	01.	0.00	2.20	2.20	2.200	1,355	19,360			79	20,794
	10.	19.30	23.80	4.50	2.400	2,772					2,772
	07.	15.00	16.00	1.00	2.600			26,400			26,400
	12.	24.50	25.60	1.10	2.600			29,040			29,040
	03.	3.00	6.80	3.80	3.000			100,320			100,320
	05.	8.00	11.00	3.00	3.000			79,200			79,200
	11.	23.80	24.50	0.70	3.000			18,480			18,480
	14.	28.00	31.00	3.00	3.000			79,200			79,200
5302	01.	0.00	2.10	2.10	3.000			55,440			55,440
5313	02.	4.00	16.00	12.00	3.000			316,800			316,800
5309	05.	2.40	8.00	5.60	3.600			147,840			147,840
5303	13.	23.70	24.20	0.50	4.000			13,200			13,200
5306	02.	8.00	14.00	6.00	4.000			158,400		238	158,638

Annexure-B9

REHABILITATION AND MAINTENANCE PLANNING SYSTEM
LIST OF ROADS IN ORDER OF COST EFFECTIVE RANKING

District: Pader

Road Class: District Road-I

Road Number	Road Name	Section Length (Km)				Maintenance Cost ('000 USh)					Per Person Cost(T-USh)	Cost Effective Ranking
		Maintainable	Not Maintainable	Uknown	Total	Routine	Periodic	Rehab	B.Neck	Total		
1	2	3	4	5	6	7	8	9	10	11	12	14
5302	Kalongo - Odokomit	51.90	2.10	0.00	54.00	23,030	251,680	55,440	832	330,981	2.37	01
5314	Aculu - Puranga	46.00	0.00	0.00	46.00	20,240			950	21,190	3.71	02
5303	Kalongo - Longoa	37.70	0.50	0.00	38.20	16,588		13,200	1,346	31,134	3.80	03
5306	Pajule - Pader - Ladinge	21.80	6.00	0.00	27.80	9,592		158,400	475	168,467	4.34	04
5301	Kalongo - Bulugi	19.30	12.60	0.80	32.70	11,026	36,960	332,640	17,785	398,411	13.98	05
5309	Adilang - Paimol	7.80	30.00	0.00	37.80	3,898		792,000		795,898	24.20	06
5317	Adilang - Lacekoto	0.00	11.00	0.00	11.00			290,400	3,432	293,832	29.46	07
5313	Refugee Camp - Arum	4.00	12.00	0.00	16.00	2,112		316,800		318,912	59.42	08
District Total : 8 roads		188.50	74.20	0.80	263.50	86,486	288,640	1,958,880	24,820	2,358,827		
Grand Total: 8 roads		188.50	74.20	0.80	263.50	86,486	288,640	1,958,880	24,820	2,358,827		

Annexure-B10

REHABILITATION AND MAINTENANCE PLANNING SYSTEM
YEAR WORK PLAN – LISTING OF ROAD SECTION DETAILS

District: Pader

Road Number	Road Name	Road Section				Maintenance Cost ('000 USh) as Assessed by ADRICS						Year Plan	Year Plan Cost (T-USh)
		Num	Start Km	End Km	Length	Routine	Periodic	Rehab	R.BNeck	S.BNeck	Total		
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Road Class: District Road-I													
5302	Kalongo - Odokomit	01.	0.00	2.10	2.10			55,440			55,440	55,440 Rehabilitation	55,440
		02.	2.10	2.70	0.60	317					317	317 Routine only	317
		03.	2.70	4.80	2.10	924					924	924 Routine only	924
		04.	4.80	6.40	1.60	845	14,080				14,925	14,925 Ro +Periodic-Partial	11,264
		05.	6.40	33.40	27.00	11,880	237,600			673	250,153	250,153 Routine only	12,553
		06.	33.40	54.00	20.60	9,064				158	9,222	9,222 Routine only	9,222
					54.00	23,030	251,680	55,440		832	330,981		89,720
5314	Aculu - Puranga	01.	0.00	11.00	11.00	4,840				792	5,632	5,632 Ro +Pe +R.Bneck/All	4,840
		02.	11.00	26.90	15.90	6,996				158	7,154	7,154 Ro +Pe +R.Bneck/All	6,996
		03.	26.90	46.00	19.10	8,404					8,404	8,404 Ro +Pe +R.Bneck/All	8,404
					46.00	20,240				950	21,190		20,240
5303	Kalongo - Longoa	01.	0.00	4.50	4.50	1,980					1,980	1,980 Ro +Pe +R.Bneck/All	1,980
		02.	4.50	7.10	2.60	1,144					1,144	1,144 Ro +Pe +R.Bneck/All	1,144
		03.	7.10	7.90	0.80	352					352	352 Ro +Pe +R.Bneck/All	352
		04.	7.90	9.20	1.30	572					572	572 Ro +Pe +R.Bneck/All	572
		05.	9.20	11.30	2.10	924				238	1,162	1,162 Ro +Pe +R.Bneck/All	924
		06.	11.30	12.70	1.40	616					616	616 Ro +Pe +R.Bneck/All	616
		07.	12.70	14.50	1.80	792				158	950	950 Ro +Pe +R.Bneck/All	1,848
		08.	14.50	15.00	0.50	220					220	220 Ro +Pe +R.Bneck/All	220
		09.	15.00	17.00	2.00	880					880	880 Ro +Pe +R.Bneck/All	880
		10.	17.00	17.20	0.20	88					88	88 Ro +Pe +R.Bneck/All	88
		11.	17.20	19.10	1.90	836					836	836 Ro +Pe +R.Bneck/All	836
		12.	19.10	23.70	4.60	2,024				238	2,262	2,262 Ro +Pe +R.Bneck/All	3,080
		13.	23.70	24.20	0.50			13,200			13,200	13,200 Ro +Pe +R.Bneck/All	13,200
		14.	24.20	35.00	10.80	4,752				713	5,465	5,465 Ro +Pe +R.Bneck/All	7,920
		15.	35.00	38.20	3.20	1,408					1,408	1,408 Ro +Pe +R.Bneck/All	1,408

Annexure-B11

REHABILITATION AND MAINTENANCE PLANNING SYSTEM
YEAR WORK PLAN - LISTING OF ROADS UNDER DIFFERENT FUNDING SOURCES

District: Pader
Funding Source: PAF-1

All Cost Amount is in '000 USh

Road Class	Road Code	Road Name	Road Length (Km)	Cost Effective Rank	Yearly Allocation From 'PAF-1'					Remarks
					Routine	Periodic	Rehab	B.Neck	Total	
1	2	3	4	5	6	7	8	9	10	11
District Road-I										
	5301	Kalongo - Bulugi	32.70	5	11,026				11,026	
						[36,960]	[79,200]	[185]	[116,345]	
					11,026	36,960	79,200	185	127,371	
	5302	Kalongo - Odokomit	54.00	1	23,030				23,030	
						[240,419]	[55,440]	[832]	[296,691]	
					23,030	240,419	55,440	832	319,720	
	5303	Kalongo - Longoa	38.20	3	16,588				16,588	
							[13,200]	[1,346]	[14,546]	
					16,588		13,200	1,346	31,134	
	5306	Pajule - Pader - Ladinge	27.80	4	9,592				9,592	
							[158,400]	[475]	[158,875]	
					9,592		158,400	475	168,467	
	5309	Adilang - Paimol	38.00	6	3,898				3,898	
							[63,360]		[63,360]	
					3,898		63,360		67,258	
	5313	Refugee Camp - Arum	16.00	8	2,112				2,112	
					2,112				2,112	
	5314	Aculu - Puranga	46.00	2	20,240				20,240	
								[950]	[950]	
					20,240			950	21,190	
Sub-Total (of Funding Source) :		7 Nos Road	252.70		86,486				86,486	

Figures within brackets show funding from other Sources

District: Pader

Annual Work Plan - Financial Summary

Cost of Road Works ('000 USh)

Funding Source	Routine	Periodic	Rehabilitation	Rd Section Bottleneck	Structure Bottleneck	Total	District Budget
PAF-1	86,486					86,486	100,000
PAF-2		36,960				36,960	120,000
PAF-3			211,200			211,200	150,000
District Dev Fund		10,419				10,419	15,000
Donor - DANIDA		230,000	158,400		7,220	395,620	350,000
District Total:	86,486	277,379	369,600		7,220	740,686	735,000
Grand Total:	86,486	277,379	369,600		7,220	740,686	735,000